

Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application Outfall 03A113 Fact Sheet

Los Alamos Neutron Science Center (LANSCE) Facility Operations (LFO)
TA-53-952 Cooling Tower





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Table of Contents

1.0	OUTFALL LOCATION [Section I]	5
2.0	FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]	
2.1	Process Schematic and Water Balance [II.A]	5
2.2	Water Treatment Processes [II.B]	5
2.3	Discharge Rate and Frequency [II.C]	6
3.0	PRODUCTION [Section III]	6
4.0	IMPROVEMENTS [Section IV]	6
5.0	INTAKE AND EFFLUENT CHARACTERISTICS [Section V]	7
5.1	Analytical Data [V.A, B, and C]	7
5.2	Potential Pollutants [V.D]	7
6.0	POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]	7
7.0	BIOLOGICAL TOXICITY TESTING DATA [Section VII]	7
8.0	CONTRACT ANALYSIS INFORMATION [Section VIII]	8
ATTAC	CHMENT A: Location Map for Outfall 03A113	A-1
ATTAC	CHMENT B: Process Schematics and Water Balances	B-1
ATTAC	CHMENT C: Photographs	
ATTAC	CHMENT D: Summary Discharge Monitoring Report October 2014 – September 2018	D-1
ΔΤΤΔ	THMENT E: Safety Data Sheets	F-1

List of Tables

- 1 Sources for Discharges to Outfall 03A113
- Wastewater Treatment Codes Assigned to Outfall 03A113
- 3 List of Treatment Chemicals used in the Operations that Contribute to Outfall 03A113
- 4 Flow Rates and Frequencies for Discharges Outfall 03A113
- 5 Potential Future Flow Rates and Frequencies for Outfall 03A113
- 6 Potential Pollutants by Source for Outfall 03A113
- 7 List of Independent Laboratories Used for NPDES Water Analysis



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INDUSTRIAL AND SANITARY OUTFALLS 2019 NPDES PERMIT RE-APPLICATION OUTFALL 03A113 FACT SHEET

1.0 OUTFALL LOCATION [Section I]

Outfall ID No.:	03A113	Outfall Location:	Technical Area 53
Category:	03A, Treated Cooling Water	Originating Structure	TA-53-952 Cooling Tower and Water
	Discharges	for the Discharge:	Treatment System
Flow Type:	Intermittent	Receiving Stream:	Ephemeral Reach of Sandia Canyon
		_	Water Quality Segment 20.6.4.128 NMAC
Longitude:	106°15'43"W	Latitude:	35°52'03"N

2.0 FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]

Outfall 03A113 is located at TA-53 and discharges to a ephemeral reach of Sandia Canyon in Water Quality Segment 20.6.4.128 NMAC. The outfall discharges treated cooling water that originates at TA-3-950 and 952. Attachment A provides a location map. The cooling tower blow-down is comprised of potable water that is treated by the cooling tower water treatment system. Table 1 identifies the discharge source, the source location, and source composition.

	Table 1 Sources for Discharges to Outfall 03A113									
TA	Buildings ^a	Transportation Mode (Piping, Truck etc.)	Discharge Source Description	Source Composition						
3	950, 952	Piping	TA-53-952 Cooling Tower	Treated Cooling Tower Blowdown Potable Water Used as Makeup Storm water						

a. The cooling tower is building TA-53-592 and the water treatment system for the cooling tower is located in the adjacent building TA-53-950.

2.1 Process Schematic and Water Balance [II.A]

A process schematic line drawing that shows the route taken by water from intake to the discharge at Outfall 03A113 is provided in Attachment B. This drawing includes all operations that contribute cooling water and storm water to the discharge at the Outfall 03A113. A water balance is also provided on the process schematic with average flows for the cooling tower intake and blowdown. The water balance is based upon actual data collected from cooling tower operations personnel and the flow meter/totalizer associated with the outfall.

2.2 Water Treatment Processes [II.B]

Outfall 03A113 receives cooling tower blowdown from the Low Energy Demonstration Accelerator (LEDA) Cooling Tower and associated water treatment system located at TA-53-952 and 950, respectively. The cooling tower provides cooling to the former LEDA beam line operations. The water treatment system includes an automatic chemical feed system that is controlled by a programmable logic controller (PLC). The PLC reacts to conductivity meters and a chlorine analyzer to add treatment chemicals, add makeup water, and/or blowdown the Tower. The treatment chemicals include bromicide, corrosion inhibitor, and a de-chlorination chemical. The bromicide and corrosion inhibitor are added to the cooling water along with makeup water prior to being circulated through the cooling Tower. The cooling loop includes a bag filter to reduce the amount of particulates that concentrates in the system as it is circulated through the loop and cooling tower. The dechlorination chemical is added to the blowdown line. Table 2 identifies the waste water treatment codes associated with the water treatment system. Attachment C provides photographs of the outfall, cooling Tower, and the wastewater treatment equipment.



	Table 2									
	Wastewater Treatment Codes Assigned to Outfall 03A113									
Treatment Code	Treatment Code Description Justification									
2-H	Disinfection (other)	Chemicals are added to Control Microorganisms								
2-E	De-Chlorination	Chlorine Scavenger Chemicals are Added								
2-L	Reduction	Chemicals that are Corrosion Inhibitors are Added								

The water treatment processes identified in Table 2 utilize chemicals to control corrosion, limit biological growth, and dechlorinate blowdown prior to discharge. Table 3 provides a list of the chemicals used to treat the water in the cooling tower.

	Table 3 List of Treatment Chemicals used in the Operations that Contribute to Outfall 03A113												
Source	Chemical Name	Reason for Use	Composition Identify Toxic Pollutan Hazardous Substances Table 2C-3										
TA-53 952 Cooling	Bromicide Tablets	Biocide	bromo-chloro-5,5-dimethyl hydantoin (chlorine source)	2C-4									
Tower	WEST C-358	Corrosion Inhibitor	Sodium hydroxide	2C-4									
	WEST R-630	De-Chlorination	Sodium bisulfite	2C-4									
	Bright Dyes FLT Yellow/Green Liquid	Water Line & Drain Tracing Dye	NA	NA									
	Bright Dyes FLT Yellow/Green Tablet	Water Line & Drain Tracing Dye	NA	NA									

2.3 Discharge Rate and Frequency [II.C]

The discharge rates and frequencies for Outfall 03A113 are provided in Table 4.

Table 4 Flow Rates and Frequencies for Discharges to Outfall 03A113											
	Freque	ency		Flow F	Rates and V	olumes					
Source ^a	Days/Week	Months	Average (MGD)	Maximum (MGD)	Average Volume (GPD)	Maximum Volume (GPD)	Duration (days)				
TA-53-952 Cooling Tower	7.0	7.0 12.0 0.001576		0.01459	1,576	14,590	365				
Storm water	0.9	1.6	0.016763	0.13678	16,763	136,678	49 b				

Calculated between October 2017 and September 2018.

MGD = million gallons per day, GPD = gallons per day

3.0 PRODUCTION [Section III]

Section III is not applicable to Outfall 03A113.

4.0 IMPROVEMENTS [Section IV]

The cooling towers identified as TA-53-293 are not currently in use but could return to service in the future. These towers use an existing water treatment system that is identical to the one used for the TA-53-952 cooling towers (see Section 2.2). Table 5 provides an estimate for the future flow rates and frequencies of the outfall if the TA-53-952 cooling towers come back online. A Notice of Change will be submitted for the TA-53-293 cooling towers prior to return to service and subsequent increased volume to the outfall. Attachment B provides a proposed schematic and water balance for the future configuration.

Duration is the number of days that the outfall received a discharge between October 2017 and September 2018



Table 5 Potential Future Flow Rates and Frequencies for Outfall 03A113											
	olumes										
Source	Days/Week Months		Average (MGD)	Maximum (MGD)	Average Volume (GPD)	Maximum Volume (GPD)	Duration (days)				
TA-53-952 Cooling Tower ^a	7.0	12.0	0.001576	0.01459	1,576	14,590	365				
Storm water	0.9	1.6	0.016763	0.1367	16,763	136,678	49 b				
TA-53-293 Cooling Towers ^c	7.0	12.0	0.0006	0.0016	557	1640	365				

- a. Calculated between October 2017 and September 2018.
- b. Duration is the number of days that the outfall received a discharge between October 2017 and September 2018.
- c. Frequency, flow rates, and volumes are estimated based upon historical data.

MGD = million gallons per day, GPD = gallons per day

5.0 INTAKE AND EFFLUENT CHARACTERISTICS [Section V]

5.1 Analytical Data [V.A, B, and C]

The analytical results provided for the Outfall 03A113 Permit Reapplication on the Form 2C were provided from the following sources:

- Samples collected on August 14, 2018 that were shipped to an independent laboratory for analysis.
- Field samples collected and analyzed on August 14, 2018 for temperature, residual chlorine, and pH.
- Field samples collected and analyzed on February 13, 2019 for sulfite.
- Discharge Monitoring Report Summary for Outfall 03A113 from October 2014 to September 2018 (Attachment D).
- Calculated Hardness = 96 mg/L (CaCO₃)

5.2 Potential Pollutants [V.D]

The treatment chemicals associated with the cooling tower water treatment system and the potable water used for makeup water to the tower constitute the pollutant load of the discharge to Outfall 03A113. Table 6 identifies the Table 2C-3 and 2C-4 pollutants by discharge source. It also identifies those pollutants (if any) that were detected in the analytical results from the samples collected for the 2019 Permit Renewal Application.

Table 6 Potential Pollutants by Source for Outfall 03A113											
Source POTENTIAL Analytical Data											
	Toxic Pollutant and/o	r Hazardous	Results								
	Substances Table 2	C-3 or 2C-4									
TA-53- 952 Cooling Tower	Sodium Hydroxide	2C-4	pH = 6.7 - 8.7 S.U.								
	Sodium Bisulfite	2C-4	Sulfite 74.7 mg/L ^a								
	Chlorine	2C-4	Total Residual Chlorine = 0								
Potable Water Used as Makeup Chlorine 2C-4 Total Residual Chlorine = 0											
a. Sulfite result may be artificially high because it v	was collected at a time of ye	ar when the coo	ling load on the towers was low.								

The safety data sheets associated with the chemicals used in the cooling tower are provided in Attachment E.

6.0 POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]

Section VI is not applicable to Outfall 03A113.

7.0 BIOLOGICAL TOXICITY TESTING DATA [Section VII]

Section VII is not applicable to Outfall 03A113.



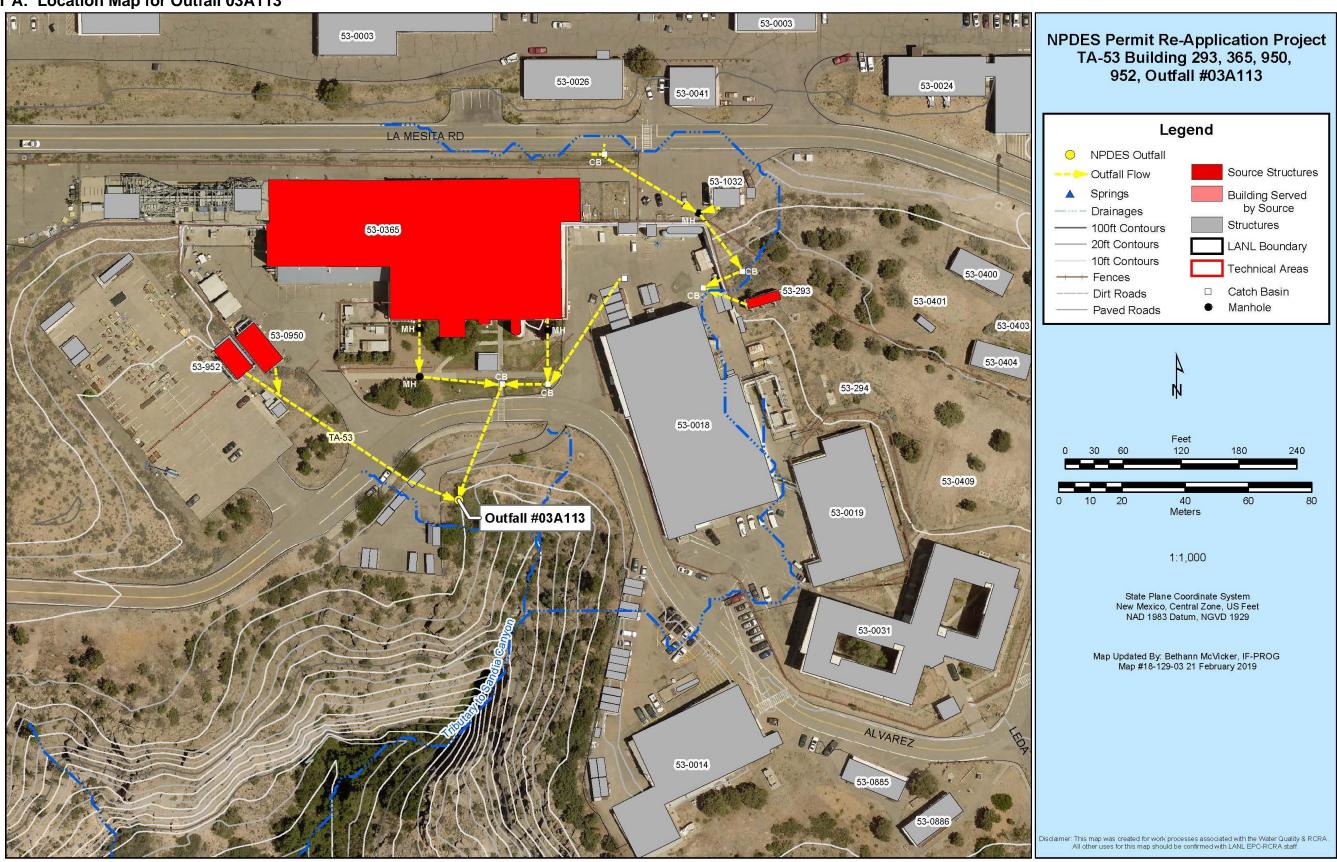
8.0 CONTRACT ANALYSIS INFORMATION [Section VIII]

Samples were collected from the cooling tower blowdown on August 14, 2018 for the Form 2C constituents required by the permit application forms. These samples were submitted to independent laboratories as summarized in Table 7.

Table 7 List of Independent Laboratories Used for NPDES Water Analysis											
Laboratory Name	Address and Contact Info	Analytes									
GEL Laboratories LLC	2040 Savage Road Charleston SC 29407 (843) 556-8171	Biological Oxygen Demand, General Chemistry, Pesticides, Polychlorinated Biphenyls, Radiochemistry, Semi-volatile Organic Compounds, Total Metals, Total Suspended Solids, Volatile Organic Compounds									
New Mexico Water Testing Laboratory, Inc.	401 North Coronado Ave Espanola, NM 87532 (505) 929-4545	E.coli									
Cape Fear Analytical LLC	3306 Kitty Hawk Road Suite 120 Wilmington, NC 28405 (910) 795-0421	TCDD (Dioxin)									



ATTACHMENT A: Location Map for Outfall 03A113



GENERAL NOTES AND LEGEND:

 Dashed line indicates equipment located the building adjacent to the cooling towers.
 Flow rates were calculated using data

PROCESS SCHEMATIC & WATER BALANCE FOR OUTFALL 03A113 February 13. 2019

2019 NPDES Permit Re-Application OUTFALL 03A113

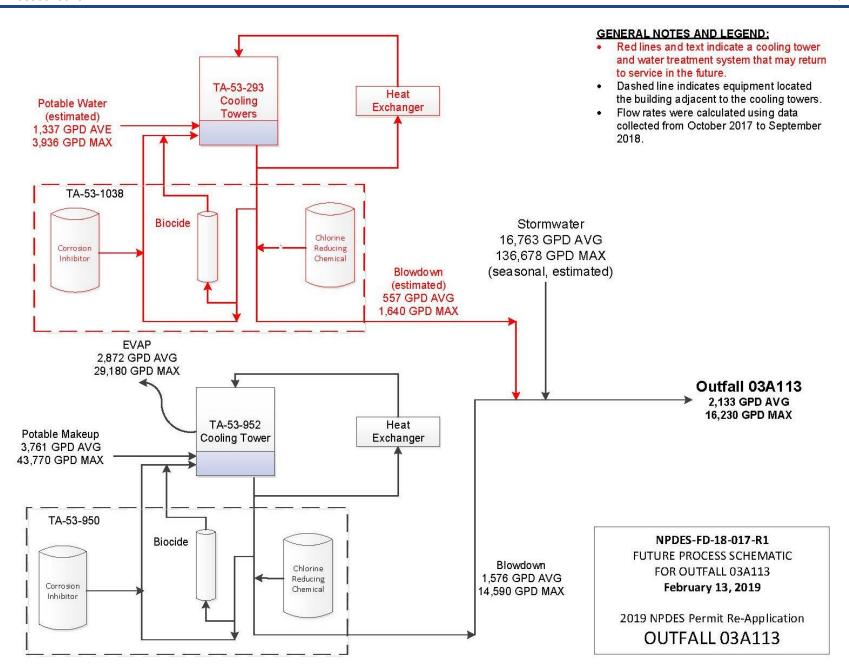


ATTACHMENT B: Process Schematics and Water Balances

collected from October 2017 to September **EVAPORATION** 2,872 GPD AVG 29,180 GPD MAX TA-53-952 Potable Water Cooling Tower (Makeup) 3,761 GPD AVG Heat 43,770 GPD MAX Exchanger Stormwater TA-53-950 16,763 GPD AVG 136,678 GPD MAX Biocide (seasonal, estimated) Chlorine Reducing Corrosion Chemical Inhibitor Outfall 03A113 1.576 GPD AVG Blowdown 14,590 GPD MAX 1,576 GPD AVG 14,590 GPD MAX NPDES-FD-18-009-R1

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application

B-1 of 2





ATTACHMENT C: Photographs

Photograph ID No.	Photograph Title
NPDES-03A113-18-001	Outfall 03A113 Location
NPDES-03A113-18-002	Outfall 03A113 Condition at Discharge Location
NPDES-03A113-18-003	Outfall 03A113 Accessibility
NPDES-03A113-18-004	Outfall 03A113 Receiving Stream Ephemeral Tributary to Sandia Canyon, Water Quality Segment Number 20.6.4.126 NMAC
NPDES-03A113-18-005	TA-53-952 Cooling Tower
NPDES-03A113-18-006	TA-53-952 Brominator
NPDES-03A113-18-007	TA-53-952 Chemical Treatment Feed Tanks
NPDES-03A113-18-008	TA-53-293 Cooling Towers [Inactive but Available for Use]
NPDES-03A113-18-009	TA-53-293 Brominator [Inactive but Available for Use]
NPDES-03A113-18-010	TA-53-293 Chemical Treatment Feed Tanks [Inactive but Available for Use]



Photograph - NPDES-03A113-18-001 **Outfall 03A113 Location**

LA-UR-19-22215 **Attachment C** C-1 of 6





Photograph - NPDES-03A113-18-002
Outfall 03A113 Condition at Discharge Location



Photograph - NPDES-03A113-18-003 Outfall 03A113 Accessibility



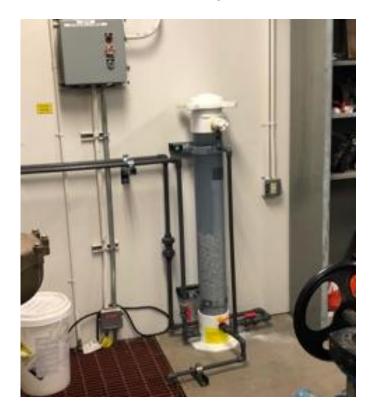


Photograph - NPDES-03A113-18-004
Outfall 03A113 Receiving Stream Ephemeral Tributary to
Sandia Canyon, Water Quality Segment Number 20.6.4.126 NMAC





Photograph - NPDES-03A113-18-005 TA-53-952 Cooling Tower



Photograph - NPDES-03A113-18-006
TA-53-952 Cooling Tower Brominator Located in TA-53-950



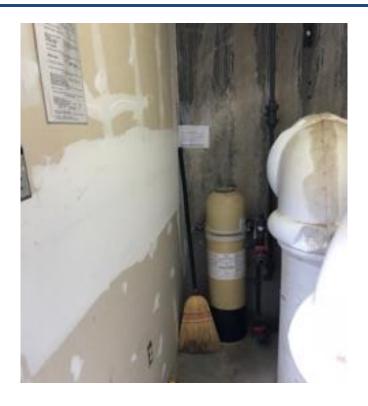


Photograph - NPDES-03A113-18-007
TA-53-952 Cooling Tower Chemical Treatment Feed Tanks Located in TA-53-950



Photograph - NPDES-03A113-18-008
TA-53-293 Cooling Towers [Inactive but Available for Use]





Photograph - NPDES-03A113-18-009 TA-53-293 Brominator Located in TA-53-1038 [Inactive but Available for Use]



Photograph - NPDES-03A113-18-010 TA-53-293 Chemical Treatment Feed Tanks Located in TA-53-1038 [Inactive but Available for Use]

LA-UR-19-22215 **Attachment C** C-6 of 6



ATTACHMENT D: Summary Discharge Monitoring Report October 2014 – September 2018

					Quantity o	r Loading		Quality or C	Concentration							
OUTFALL			Monitoring		,									Number of		
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency	Notes
03A113	TA-53-950, 952, 293	2014	Oct	Flow (Totalized Est.)	0.000533	0.002000	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2014	Nov	Flow (Totalized Est.)	0.000663	0.002080	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2014	Dec	Flow (Totalized Est.)	0.000541	0.003500	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	Jan	Flow (Totalized Est.)	0.000940	0.010190	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	Feb	Flow (Totalized Est.)	0.001001	0.003770	MGD							28	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	Mar	Flow (Totalized Est.)	0.000519	0.001640	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	Apr	Flow (Totalized Est.)	0.000829	0.002410	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	May	Flow (Totalized Est.)	0.002479	0.006400	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	Jun	Flow (Totalized Est.)	0.001508	0.006490	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	Jul	Flow (Totalized Est.)	0.001134	0.004680	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	Aug	Flow (Totalized Est.)	0.001375	0.004800	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	Sept	Flow (Totalized Est.)	0.002362	0.021210	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	Oct	Flow (Totalized Est.)	0.000615	0.002450	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	Nov	Flow (Totalized Est.)	0.000429	0.001350	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	Dec	Flow (Totalized Est.)	0.000204	0.000650	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	Jan	Flow (Totalized Est.)	0.000964	0.005090	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	Feb	Flow (Totalized Est.)	0.001027	0.002010	MGD							29	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	Mar	Flow (Totalized Est.)	0.000432	0.001110	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	Apr	Flow (Totalized Est.)	0.001253	0.010570	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	May	Flow (Totalized Est.)	0.000386	0.000780	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	Jun	Flow (Totalized Est.)	0.000825	0.001620	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	Jul	Flow (Totalized Est.)	****	****	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	Aug	Flow (Totalized Est.)	****	****	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	Sept	Flow (Totalized Est.)	0.002688	0.020790	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	Oct	Flow (Totalized Est.)	0.000445	0.001420	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	Nov	Flow (Totalized Est.)	0.000729	0.008260	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	Dec	Flow (Totalized Est.)	0.001016	0.002630	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293			Flow (Totalized Est.)	0.000493	0.001280	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2017	Feb	Flow (Totalized Est.)	0.001171	0.005600	MGD							28	Daily	Permit Required
03A113	TA-53-950, 952, 293	2017	Mar	Flow (Totalized Est.)	0.003053	0.013310	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293		•	Flow (Totalized Est.)	0.006244	0.032850	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293		•	Flow (Totalized Est.)	0.001183	0.003170	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293			Flow (Totalized Est.)	0.001802	0.003800	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2017		Flow (Totalized Est.)	0.001234	0.002180	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293		~	Flow (Totalized Est.)	0.000957	0.002750	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293			Flow (Totalized Est.)	0.001983	0.003850	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293			Flow (Totalized Est.)	0.000453	0.001380	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2017	Nov	Flow (Totalized Est.)	0.000729	0.008260	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293			Flow (Totalized Est.)	0.000664	0.006530	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2018		Flow (Totalized Est.)	0.000254	0.001750	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293			Flow (Totalized Est.)	0.000445	0.001060	MGD							28	Daily	Permit Required
03A113	TA-53-950, 952, 293	2018	Mar	Flow (Totalized Est.)	0.000769	0.002290	MGD							31	Daily	Permit Required



					Quantity o	r Loading		Quality or Concentration								
OUTFALL			Monitoring		- Quantity o			Quanty or c						Number of		
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency	Notes
03A113	TA-53-950, 952, 293	2018	Apr	Flow (Totalized Est.)	0.001786	0.006280	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2018		Flow (Totalized Est.)	0.003529	0.014590	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2018	Jun	Flow (Totalized Est.)	0.002411	0.011370	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293		Jul	Flow (Totalized Est.)	0.003297	0.013190	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2018		Flow (Totalized Est.)	0.003496	0.011120	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2018	Sept	Flow (Totalized Est.)	0.000205	0.000760	MGD							30	Daily	Permit Required
	, ,			Flow (Totalized Est.)		imum 30 Day			0.0062				mg/L	1,461	,	,
				Flow (Totalized Est.)			/laximum			0.0329			mg/L	1,461		
03A113	TA-53-950, 952, 293	2014	Oct	рН				7.9	****	8.6	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2014	Nov	рН				7.6	****	8.7	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2014	Dec	рН				7.5	****	8.4	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Jan	рН				7.7	****	8.1	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Feb	рН				7.6	****	8.4	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Mar	рН				7.8	****	8.4	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Apr	рН				8.3	****	8.7	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	May	pH				8.1	****	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Jun	pH				7.3	****	7.9	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Jul	pH				7.5	****	8.5	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Aug	pH				7.6	****	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Sept	pH				7.3	****	8.3	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293		•	pH				7.3	****	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Nov	pH				6.9	****	7.3	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Dec	pH				7.1	****	7.5	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2016	Jan	pH				7.2	****	7.9	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2016	Feb	pH				6.8	****	8.7	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2016	Mar	рН				7.2	****	7.3	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2016	Apr	рН				7.1	****	7.2	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2016	May	рН				7.0	****	7.3	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2016	Jun	рН				7.1	****	7.4	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2016	Jul	рН				****	****	****	S.U.	6.0 - 9.0	S.U.	0.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2016	Aug	рH				****	****	****	S.U.	6.0 - 9.0	S.U.	0.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2016	Sept	рH				6.9	****	7.2	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2016	Oct	рH				6.9	****	7.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2016	Nov	рH				7.4	****	8.0	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2016	Dec	pH				7.4	****	7.7	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Jan	pH				7.2	****	7.4	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Feb	pH				7.2	****	8.2	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Mar	pH				7.1	****	8.0	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			pH				7.2	****	7.3	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	May	pH				7.3	****	7.5	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			pH				7.3	****	7.7	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			pH				7.3	****	8.2	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Aug	pH				7.4	****	8.3	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Sept	pH				7.4	****	8.2	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required



					Quantity of	r Loading		Quality or C	Concentration							
OUTFALL			Monitoring		,									Number of		
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency	Notes
03A113	TA-53-950, 952, 293	2017	Oct	рН				7.2	****	7.5	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Nov	рН				7.0	****	8.0	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Dec	рН				6.8	****	7.5	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Jan	рН				7.1	****	7.3	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Feb	рН				7.2	****	7.3	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Mar	рН				7.1	****	7.5	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Apr	рН				7.0	****	7.2	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	May	рН				7.0	****	7.2	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Jun	рН				6.7	****	7.0	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Jul	рН				7.0	****	8.0	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Aug	рН				6.8	****	7.1	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Sept	рН				6.8	****	7.2	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
				рН			Minimum	6.7						201		
				рН	Max	cimum 30 Day	y Average		8.54					201		
				рН		<u> </u>	Maximum			8.7				201		
03A113	TA-53-950, 952, 293	2014	Oct	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2014	Nov	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2014	Dec	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Jan	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Feb	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Apr	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	May	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Jun	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Jul	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Aug	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	•	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293		•	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			Total Residual Chlorine				****	****	***	mg/L	0.011	mg/L	0.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			Total Residual Chlorine				****	****	***	mg/L	0.011	mg/L	0.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2016		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Feb	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required



					Quantity o	r Loading		Quality or 0	Concentration							
OUTFALL			Monitoring		,									Number of		
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency	Notes
03A113	TA-53-950, 952, 293	2017	Mar	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Apr	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	May	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Jun	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Jul	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Aug	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Sept	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Oct	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Nov	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Dec	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
	TA-53-950, 952, 293	2018	Jan	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
	TA-53-950, 952, 293	2018	Feb	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
	TA-53-950, 952, 293	2018	Mar	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
	TA-53-950, 952, 293	2018	Apr	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
	TA-53-950, 952, 293	2018		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
-	TA-53-950, 952, 293	2018	•	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
	TA-53-950, 952, 293	2018	Jul	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
	TA-53-950, 952, 293	2018		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
	TA-53-950, 952, 293			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
				Total Residual Chlorine		Daily	Average						- Oi	201	,	
				Total Residual Chlorine	Max	imum 30 Day			0					201		
				Total Residual Chlorine		_	/laximum			0				201		
03A113	TA-53-950, 952, 293	2014	Dec	Phosphorus, Total				****	0.142	0.142	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
-	TA-53-950, 952, 293	2015		Phosphorus <u>, Total</u>				****	0.0949	0.0949	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
	TA-53-950, 952, 293			Phosphorus, Total				****	0.155	0.155	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
	TA-53-950, 952, 293		Sept	Phosphorus, Total				****	0.0729	0.0729	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
	TA-53-950, 952, 293	2015	•	Phosphorus, Total				****	<0.056	<0.056	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
	TA-53-950, 952, 293			Phosphorus, Total				****	0.0939	0.0939	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
	TA-53-950, 952, 293			Phosphorus, Total				****	0.0722	0.0722	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
	TA-53-950, 952, 293			Phosphorus, Total				****	0.302	0.302	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
	TA-53-950, 952, 293			Phosphorus, Total				****	0.147	0.147	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
	TA-53-950, 952, 293			Phosphorus <u>, Total</u>				****	0.074	0.074	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
	TA-53-950, 952, 293			Phosphorus <u>, Total</u>				****	0.0952	0.0952	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
	TA-53-950, 952, 293			Phosphorus, Total				****	0.0948	0.0948	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
	TA-53-950, 952, 293		-	Phosphorus, Total				****	0.144	0.144	mg/L	20 - 40	mg/L	1 1	Quarterly	Permit Required
	TA-53-950, 952, 293			Phosphorus, Total				****	0.103	0.103	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
	TA-53-950, 952, 293			Phosphorus, Total				****	0.144	0.144	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
	TA-53-950, 952, 293			Phosphorus, Total				****	0.0982	0.0982	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
30.1220	55 556, 552, 255		3000	Phosphorus, Total		Daily	Average		0.1	5.5552	<u>o</u> , -	_5 .5	0/ -	16	Z.3. COTTY	required
				Phosphorus, Total	Max	imum 30 Day			0.302					16		
				Phosphorus, Total	11107		/laximum		0.002	0.302				16		
03A113	TA-53-950, 952, 293	2014	Dec	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
	TA-53-950, 952, 293			Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
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					Quantity o	r Loading		Quality or C	Quality or Concentration							
OUTFALL			Monitoring		,									Number of		
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency	Notes
03A113	TA-53-950, 952, 293	2015	Sept	Total Suspended Solids				***	1	1	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2015	Dec	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2016	Mar	Total Suspended Solids				****	0.7	0.7	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2016	Jun	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2016	Sept	Total Suspended Solids				****	<0.582	<0.582	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2016	Dec	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2017	Mar	Total Suspended Solids				****	5.68	5.68	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2017	Jun	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2017	Sept	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2017	Dec	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2018	Mar	Total Suspended Solids				****	0.6	0.6	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2018	Jun	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2018	Sept	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
				Total Suspended Solids		Daily	/ Average		1.8					16		
				Total Suspended Solids	Max	imum 30 Day	/ Average		5.68					16		
				Total Suspended Solids			Maximum			5.68				16		
03A113	TA-53-950, 952, 293	2015	Sept	Copper, Dissolved				****	****	0.00315	mg/L		mg/L	1	Yearly	Permit Required
03A113	TA-53-950, 952, 293	2016	Sept	Copper, Dissolved				****	****	0.00728	mg/L	NA	mg/L	1	Yearly	Permit Required
03A113	TA-53-950, 952, 293	2017	Sept	Copper, Dissolved				****	****	0.00395	mg/L		mg/L	1	Yearly	Permit Required
03A113	TA-53-950, 952, 293	2018	Sept	Copper, Dissolved				****	****	0.00489	mg/L		mg/L	1	Yearly	Permit Required
				Copper <u>, Dissolved</u>			/ Average		0.0048					4		
				Copper <u>, Dissolved</u>	Max	imum 30 Day	/ Average		0.00728					4		
				Copper <u>, Dissolved</u>		<u> </u>	Maximum			0.00728				4		
03A113				Aluminum, Total				****	****	<0.015	mg/L		mg/L	1	Yearly	Permit Required
03A113		2016	Sept	Aluminum, Total				****	****	<0.015	mg/L	NA	mg/L	1	Yearly	Permit Required
03A113	TA-53-950, 952, 293	2017	Sept	Aluminum, Total				****	****	<0.0193	mg/L		mg/L	1	Yearly	Permit Required
03A113	TA-53-950, 952, 293	2018	Sept	Aluminum, Total				****	****	<0.0193	mg/L		mg/L	1	Yearly	Permit Required
				Aluminum <u>, Total</u>			Average							4		
				Aluminum <u>, Total</u>	Max	timum 30 Day	/ Average		0					4		
				Aluminum <u>, Total</u>			Maximum			0				4		
03A113	TA-53-950, 952, 293	2016		Adjusted Gross Alpha				****	0	0	pCi/L	NA	mg/L	1	Term	Permit Required
				, Total Adjusted Gross Alpha			Average							1		
				, Total Adjusted Gross Alpha	Max	cimum 30 Day								1		
			Mercury	, Total Adjusted Gross Alpha		N	Maximum			0				1		



ATTACHMENT E: Safety Data Sheets

LIST OF SAFETY DATA SHEETS
Bromocide Tablets
WEST C-358
WEST R-630
Bright Dyes FLT Yellow/Green Liquid
Bright Dyes FLT Yellow/Green Tablet



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BROMICIDE TABLETS



Revision date: 3/28/2016

Revision: 9



SAFETY DATA SHEET **BROMICIDE TABLETS**

1. Identification

Product identifier

Product name **BROMICIDE TABLETS**

Chemical name Bromo-chloro-5,5-dimethylhydantoin

Product number 100405, 100406, 100407, 100412, 100414, 100794, 101187

CAS number 32718-18-6

Recommended use of the chemical and restrictions on use Application

Biocides for water treatment.

Details of the supplier of the safety data sheet

BWA Water Additives US LLC Supplier

1979 Lakeside Parkway Suite 925, Tucker, GA30084

USA

T: +1 800 600 4523 T: +1 678 802 3050

E: msds@wateradditives.com

Emergency telephone number

CHEMTREC Phone: 1-800-424-9300 **Emergency telephone**

2. Hazard(s) identification

Classification of the substance or mixture

Physical hazards Ox. Sol. 3 - H272

Health hazards Acute Tox. 4 - H302 Skin Corr. 1C - H314 Eye Dam. 1 - H318 Skin Sens. 1 - H317

Environmental hazards Aquatic Acute 1 - H400

Label elements

Pictogram









Signal word

Danger

Hazard statements H272 May intensify fire; oxidizer.

H302 Hamful if swallowed.

H314 Causes severe skin burns and eye damage.

H317 May cause an allergic skin reaction.

H400 Very toxic to aquatic life.



Revision date: 3/28/2016 Revision: 9

BROMICIDE TABLETS

Precautionary statements P210 Keep away from heat, sparks, open flames and hot surfaces. No smoking.

P220 Keep away from combustible materials.

P221 Take any precaution to avoid mixing with combustibles.

P260 Do not breathe vapor/ spray.
P261 Avoid breathing vapor/ spray.

P264 Wash contaminated skin thoroughly after handling. P270 Do not eat, drink or smoke when using this product.

P272 Contaminated work clothing must not be allowed out of the workplace.

P273 Avoid release to the environment.

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

P301+P310 If swallowed: Immediately call a poison center/ doctor. P301+P330+P331 If swallowed: Rinse mouth. Do NOT induce vomiting.

P302+P352 If on skin: Wash with plenty of water.

P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse

skin with water/ shower.

P304+P340 If inhaled: Remove person to fresh air and keep comfortable for breathing.

P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact

lenses, if present and easy to do. Continue rinsing.

P321 Specific treatment (see medical advice on this label).

P333+P313 If skin irritation or rash occurs: Get medical advice/ attention. P362+P364 Take off contaminated clothing and wash it before reuse.

P363 Wash contaminated clothing before reuse.

P370+P378 In case of fire: Use foam, carbon dioxide, dry powder or water fog to extinguish.

P391 Collect spillage. P405 Store locked up.

P501 Dispose of contents/ container in accordance with national regulations.

Contains Bromo-chloro-5,5-dimethylhydantoin

3. Composition/information on ingredients

Mixtures

Bromo-chloro-5,5-dimethylhydantoin

96.0%

CAS number: 32718-18-6 M factor (Acute) = 1

Classification

Ox. Sol. 3 - H272 Acute Tox. 4 - H302 Skin Corr. 1C - H314 Eye Dam. 1 - H318 Skin Sens. 1 - H317 Aquatic Acute 1 - H400

Inert ingredients

4.0%

CAS number: -

Classification

Not Classified

The Full Text for all Hazard Statements are Displayed in Section 16.

Composition comments

1-bromo-3-chloro-5,5-dimethylhydantoin



Revision date: 3/28/2016 Revision: 9

BROMICIDE TABLETS

4. First-aid measures

Description of first aid measures

Move affected person to fresh air and keep warm and at rest in a position comfortable for Inhalation

breathing. Get medical attention. Show this Safety Data Sheet to the medical personnel.

Ingestion Do not induce vomiting. Give plenty of water to drink. Rinse mouth thoroughly with water.

Never give anything by mouth to an unconscious person. Get medical attention. Show this

Safety Data Sheet to the medical personnel.

Skin Contact Remove contaminated clothing. Rinse immediately with plenty of water. Continue to rinse for

at least 15 minutes. Get medical attention. Show this Safety Data Sheet to the medical

personnel.

Eve contact Rinse immediately with plenty of water. Remove any contact lenses and open eyelids wide

apart. Continue to rinse for at least 15 minutes. Get medical attention. Show this Safety Data

Sheet to the medical personnel.

Most important symptoms and effects, both acute and delayed

Dust may irritate the respiratory system. Inhalation

Ingestion May cause stomach pain or vomiting. May cause chemical burns in mouth and throat. Due to

the physical nature of this material it is unlikely that swallowing will occur.

Skin contact Chemical burns. Burning pain and severe corrosive skin damage.

Eye contact Severe irritation, burning and tearing

Indication of immediate medical attention and special treatment needed

Notes for the doctor If lavage is performed suggest endotracheal and/or esophageal control.Danger from lung

> aspiration must be weighed against toxicity when considering emptying the stomach. The decision of whether to induce vomiting or not should be made by a physician. Chemical eye burns may require extended irrigation. Obtain prompt consultation preferably from an opthalmologist.lf burn is present, treat as any thermal burn, after decontamination. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical

condition of the patient.

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media Extinguish with the following media: Water spray, fog or mist. Alcohol-resistant foam.

Unsuitable extinguishing

media

Carbon dioxide (CO2). Dry chemicals.

Special hazards arising from the substance or mixture

Specific hazards Toxic gases/vapors/fumes of: Bromine. Chlorine. Oxides of the following substances: Carbon.

Nitrogen. Thermal decomposition or combustion products may include the following

substances: Toxic gases or vapors.

Advice for firefighters

Protective actions during

firefighting

Move containers from fire area if it can be done without risk. Control run-off water by

containing and keeping it out of sewers and watercourses.

for firefighters

Special protective equipment Leave danger zone immediately. Wear positive-pressure self-contained breathing apparatus

(SCBA) and appropriate protective clothing.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures



Revision date: 3/28/2016

BROMICIDE TABLETS

Revision: 9

Personal precautions Follow precautions for safe handling described in this safety data sheet. For personal

protection, see Section 8.

Environmental precautions

Environmental precautions Avoid release to the environment. To prevent release, place container with damaged side up.

Methods and material for containment and cleaning up

Methods for cleaning up Provide adequate ventilation. Contain spillage with sand, earth or other suitable non-

combustible material. Avoid the spillage or runoff entering drains, sewers or watercourses. Collect spillage for reclamation or disposal in sealed containers via a licensed waste contractor. Containers with collected spillage must be properly labeled with correct contents and hazard symbol. Wash thoroughly after dealing with a spillage. Avoid generation and

spreading of dust. Avoid contact with water.

Reference to other sections For personal protection, see Section 8. For waste disposal, see section 13.

7. Handling and storage

Precautions for safe handling

Usage precautions Provide adequate ventilation. Avoid inhalation of vapors. Use approved respirator if air

contamination is above an acceptable level. Do not use in confined spaces without adequate ventilation and/or respirator. Avoid spilling. Avoid contact with skin and eyes. Avoid contact with the following materials: Acids. Moisture. Avoid handling which leads to dust formation.

Conditions for safe storage, including any incompatibilities

Storage precautions Store in tightly-closed, original container in a dry, cool and well-ventilated place. Keep

container tightly closed. Protect from light. Keep away from heat, sparks and open flame.

Store away from the following materials: Reducing agents.

Storage class Oxidizer storage.

Specific end uses(s)

Specific end use(s) The identified uses for this product are detailed in Section 1.2.

8. Exposure Controls/personal protection

Ingredient comments No exposure limits known for ingredient(s)

Exposure controls

Protective equipment





Appropriate engineering controls All handling should only take place in well-ventilated areas.

Eye/face protection The following protection should be worn: Chemical splash goggles or face shield.

Hand protection Selection of a suitable glove depends on work conditions and whether the product is present

on its own or in combination with other substances. Wear protective gloves made of the following material: Butyl rubber. Neoprene. Nitrile rubber. Polyethylene. Polyvinyl chloride (PVC). Gloves should be replaced immediately if signs of degradation are observed.

Other skin and body protection

Wear appropriate clothing to prevent any possibility of skin contact. Wear a suitable dust

mask. Wear apron or protective clothing in case of contact.



Revision date: 3/28/2016 Revision: 9

BROMICIDE TABLETS

Hygiene measures Use engineering controls to reduce air contamination to permissible exposure level. Provide

eyewash station. No specific hygiene procedures recommended but good personal hygiene practices should always be observed when working with chemical products. Contaminated

clothing should be placed in a closed container for disposal or decontamination.

Respiratory protection Wear a suitable dust mask.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Appearance Tablet.

Color White/off-white. Odor Slight Halogen

Odor threshold Not available. Not available.

pH (diluted solution): 3.5 @ 0.15 % pH

Melting point 156 - 162°C Initial boiling point and range Not known.

Freezing Point

Flash point Not applicable. Evaporation rate Not known. Evaporation factor Not applicable.

Upper/lower flammability or

explosive limits

Not available.

Vapor pressure 0.0038 Pa @ °C Vapor density Not available. Not applicable. Relative density

Bulk density 0.9 kg/l

Solubility(ies) 0.15 @ °C Slightly soluble in water.

log Pow: 0.35 Partition coefficient Auto-ignition temperature Not available. Viscosity Not known.

Explosive properties There are no chemical groups present in the product that are associated with explosive

properties.

Oxidizing properties The product contains a substance classified as oxidizing. Keep away from flammable and

combustible materials.

Molecular weight 241.47

Molecular Formula C5 H6 Br Cl N2 O2

10. Stability and reactivity

Reactivity This material has oxidising properties.

Stability Stable at normal ambient temperatures. Avoid the following conditions: Moisture.



Revision date: 3/28/2016 Revision: 9

BROMICIDE TABLETS

Possibility of hazardous

reactions

Will not polymerize.

Conditions to avoid Generates toxic gas in contact with acid. Avoid excessive heat for prolonged periods of time.

Avoid heat, flames and other sources of ignition.

Materials to avoid Strong acids. Strong reducing agents. Strong alkalis.

Hazardous decomposition Toxic gases/vapors/fumes of: Hydrogen bromide (HBr). Bromine. Hydrogen chloride (HCl). products

Chlorine. Oxides of the following substances: Carbon. Nitrogen.

11. Toxicological information

Information on toxicological effects

Toxicological effects Ames Test negative

Other health effects There is no evidence that the product can cause cancer.

Supplemental Toxicological

Information

Acute toxicity - oral

Acute toxicity oral (LD∞

mg/kg)

578.0

Rat **Species** 520.83 ATE oral (mg/kg)

Acute toxicity - dermal

Acute toxicity dermal (LD60

mg/kg)

2,000.0

Rabbit Species

Germ cell mutagenicity

Ames test: Negative. Genotoxicity - in vitro

Inhalation May cause respiratory system irritation.

Ingestion Harmful if swallowed.

Skin Contact Causes burns. May cause sensitisation by skin contact.

Eye contact Causes burns.

Acute and chronic health

hazards

Causes severe burns. May cause sensitisation by skin contact.

Route of entry Skin and/or eye contact Ingestion.

12. Ecological Information

Ecotoxicity The product contains a substance which is very toxic to aquatic organisms.

Toxicity

LC50, 96 hours: 0.87 mg/l, Onchorhynchus mykiss (Rainbow trout) Acute toxicity - fish

LC50, 96 hours: 0.87 mg/l, Fish



Revision date: 3/28/2016 Revision: 9

BROMICIDE TABLETS

Acute toxicity - aquatic

invertebrates

EC₅₀, 48 hours: 0.46 mg/l, Daphnia magna EC₅₀, 48 hours: 0.46 mg/l, Daphnia magna

Persistence and degradability

Persistence and degradability Halogens w

Halogens will dissociate in water leaving DMH. DMH is readily biodegradable in a CO2 Evolution study and passes the 10-day window criteria. DMH has also been shown to be

rapidly degraded in a water/sediment system.

Chemical oxygen demand 1.005 g O₂/g substance

Bioaccumulative potential

Bio-Accumulative Potential Low bioaccumulation potential

Partition coefficient log Pow: 0.35

Mobility in soil

Mobility No information available.

Results of PBT and vPvB assessment

Results of PBT and vPvB

This substance is not classified as PBT or vPvB according to current EU criteria.

assessment

Other adverse effects

Acute Toxicity. Lc50 96 Hours, >640 American Oyster

Mg/L

13. Disposal considerations

Waste treatment methods

General information When handling waste, the safety precautions applying to handling of the product should be

considered

Disposal methods Dispose of waste to licensed waste disposal site in accordance with the requirements of the

local Waste Disposal Authority. Absorb in vermiculite, dry sand or earth and place into containers. Dispose of waste via a licensed waste disposal contractor. Liquid material should be incinerated. Material absorbed onto sand or earth should be disposed of as solid waste in accordance with local regulations. Empty packaging may contain product residues and due

consideration should be given prior to disposal.

Waste class 07 01 99

14. Transport information

UN Number

UN No. (TDG) 3085 UN No. (IMDG) 3085 UN No. (ICAO) 3085 UN No. (DOT) 3085

UN proper shipping name

Proper shipping name (TDG) OXIDISING SOLID, CORROSIVE, N.O.S., (contains bromo-chloro-dimethylhydantoin) 5.1(8),

PGIII, MARINE POLLUTANT

Proper shipping name (IMDG) OXIDISING SOLID, CORROSIVE, N.O.S., (contains bromo-chloro-dimethylhydantoin) 5.1(8),

PGIII, MARINE POLLUTANT



Revision date: 3/28/2016

Revision: 9

BROMICIDE TABLETS

Proper shipping name (ICAO) OXIDISING SOLID, CORROSIVE, N.O.S., (contains bromo-chloro-dimethylhydantoin) 5.1(8),

PGIII, MARINE POLLUTANT

Proper shipping name (DOT) OXIDISING SOLID, CORROSIVE, N.O.S., (contains bromo-chloro-dimethylhydantoin) 5.1(8),

PGIII, MARINE POLLUTANT

Transport hazard class(es)

TDG class 5.1+8 TDG label(s) 5.1+8 **IMDG Class** 5.1+8 ICAO class/division 5.1 ICAO subsidiary risk

Transport labels





Packing group

TDG Packing Group 111 IMDG packing group 111 ICAO packing group Ш DOT packing group Ш

Environmental hazards

Environmentally Hazardous Substance



Special precautions for user

EmS F-A, S-Q

Transport in bulk according to Not applicable. Annex II of MARPOL 73/78

and the IBC Code

Classification Code (Adr) OC2

15. Regulatory information

Regulatory Status This chemical is a pesticide product registered by the Environmental Protection Agency and is

subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label: DANGER Avoid contact with eyes, skin and clothing. EPA Reg. No.

Regulatory References 29 CFR 1910.1010 Federal Regulations (OSHA Standard)

Canadian Regulatory Status PMRA PCP No. 31855



Revision date: 3/28/2016 Revision: 9

BROMICIDE TABLETS

16. Other information

General information For advice on chemical emergencies, spillages, fires or first aid in relation to this product

please contact the relevant emergency number below: EU/English Speakers - +44 (0) 1235 239 670 (NCEC) Arabic Speakers - +44 (0) 1235 239 671 Asia/Pacific countries - +65 3158

1074 Within Mainland China: +86 532 8388 9090 (NRCC).

To/From China: +86 10 5100 3039 (NCEC)

Revision comments Section 15 revision, added US regulatory status and EPA Reg. No.

Issued by BWA Water Additives Regulatory Group, +44(0)1618646699

Revision date 3/28/2016

Revision 9

SDS No. 11306

Hazard statements in full H272 May intensify fire; oxidizer.

H302 Harmful if swallowed.

H314 Causes severe skin burns and eye damage.

H317 May cause an allergic skin reaction. H318 Causes serious eye damage. H400 Very toxic to aquatic life.

KIWA Certification

NSF Non Food Program

NSF/ANSI Standard 60

For safety reasons it is IMPERATIVE that customers:-

^{1.} Ensure that all those within their control who use the products are supplied with all relevant information contained within the Safety Data Sheet and Technical Bulletin concerning the applications for which the product is designed and any instructions and warnings contained therein.

^{2.} Consult BWA Water Additives before using or supplying the product for any other applications. The information contained herein is based on the present state of our knowledge and is intended to describe our products from the point of view of safety requirements. It should not therefore be construed as guaranteeing specific properties.



WEST -358





HMS RATING: HEALTH 2 FLAMMABILITY 0 REACTIVITY 0 OTHER C

Safety Data Sheet WEST C-358

SECTION 1: Identification

1.1 Product identifier

Product name WEST C-358 Cooling Tower Inhibitor

Product number C-358

1.2 Recommended use An aqueous corrosion and scale inhibitor. This product is designed

specifically for the control of corrosion and mineral scales in open

circulating cooling water systems.

1.3 Supplier's details

Name Water & Energy Systems Technology, Inc.

Address 13109 Arctic Cr.

Santa Fe Springs, CA 90670

Telephone (562) 921-5191

1.4 Emergency phone number(s) Chem-Tel (U.S.): (800) 255-3924

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

GHS classification in accordance with OSHA (29 CFR 1910.1200)

- Skin corrosion/irritation (chapter 3.2), Cat. 1A
- Eye damage/irritation (chapter 3.3), Cat. 1
- Corrosive to metals (chapter 2.16), Cat. 1

2.2 GHS label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)

H290 May be corrosive to metals
H302 Harmful if swallowed

H314 Causes severe skin burns and eye damage

H332 Harmful if inhaled

Precautionary statement(s)

P260 Do not breathe fume/gas/mist/vapors/spray.
P264 Wash hands thoroughly after handling.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 1 of 6

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse

skin with water/shower.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove

contact lenses if present and easy to do. Continue rinsing. P312 Call a POISON CENTER or doctor/physician if you feel unwell. P406 Store in a corrosive resistant container with a resistant inner liner.

SECTION 3: Composition/information on ingredients

Mixtures 3.1

Hazardous components

1. Sodium Hydroxide

10 - 15 % (Weight) Concentration

CAS no. 1310-73-2

2. Azole Salts

Concentration 1 - 5 % (Weight)

CAS no. NA

Trade secret statement (OSHA 1910.1200(i))

Specific chemical identity and/or exact percentage of composition has been withheld as a trade secret.

SECTION 4: First-aid measures

Description of necessary first-aid measures

General advice Avoid contact with skin, eyes and clothing. Wash hands before breaks and

immediately after handling the product.

If inhaled Remove to fresh air. If not breathing, give artificial respiration. Get immediate

medical attention.

In case of skin contact Immediately remove clothing under safety shower. Flush skin with large

amounts of soap and water. Wash clothing separately before reuse.

In case of eye contact Flush eye with water for 15 minutes. Get medical attention.

If swallowed Do NOT induce vomiting. Give victim large quantities of water. Call a

physician or poison control center immediately. Never give anything by

mouth to an unconscious person.

4.2 Most important symptoms/effects, acute and delayed

ACUTE: Multiple small burns can result from exposure.

CHRONIC: Death may occur if penetration into vital areas occurs. Scarring may so constrict or destroy damaged

tissue that extensive corrective surgery may be required.

SECTION 5: Fire-fighting measures

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 2 of 6



5.1 Suitable extinguishing media

No data available.

5.2 Specific hazards arising from the chemical

No data available.

5.3 Special protective actions for fire-fighters

No special fire fighting procedures.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

See section 8.

6.2 Environmental precautions

Do not flush to sewer, drains, or surface waters.

Methods and materials for containment and cleaning up

Clean up spills immediately, observing precautions in Exposure Protection section of this SDS. Flush with a water spray. Pick up wash liquid with absorbent or vacuum and place in a disposable container. Large spills should be handled according to a predetermined plan.

SECTION 7: Handling and storage

Precautions for safe handling

Use with adequate ventilation. Follow all SDS/label precautions even after container is emptied because they may retain product residues.

7.2 Conditions for safe storage, including any incompatibilities

Contents may develop pressure upon prolonged storage. Loosen closure cautiously before opening.

7.3 Specific end use(s)

No data available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

1. Sodium hydroxide (CAS: 1310-73-2)

PEL (Inhalation): 2 mg/m3 Ceiling (OSHA) TLV (Inhalation): 2 mg/m3 Ceiling (ACGIH)

8.2 Appropriate engineering controls

Local exhaust ventilation may be necessary to control any air containments to within their PELs (TLVs) during the use of this product.

8.3 Individual protection measures, such as personal protective equipment (PPE) Eve/face protection

Wear safety glasses with side shields (or goggles) and a face shield.

Nitrile rubber, PVC, or Neoprene gloves are suitable protective materials.

Body protection

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 3 of 6

LA-UR-19-22215 Attachment E



Where splashing is possible, full chemically resistant protective clothing, rubber apron and boots are required.

Respiratory protection

NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited.

Thermal hazards

No data available.

Environmental exposure controls

No data available.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance/form Amber or Yellow Liquid

Odor Bland рН 12.0

Melting point/freezing point No data available. >212 F

Initial boiling point and boiling range

Flash point No data available. Evaporation rate <1 (butyl acetate = 1) Flammability (solid, gas) No data available. Vapor pressure No data available. Vapor density No data available.

Relative density 1.102 Solubility(ies) Water Soluble

SECTION 10: Stability and reactivity

10.1 Reactivity

No data available.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available.

10.4 Conditions to avoid

Do not mix with other industrial chemicals.

10.5 Incompatible materials

Acids, oxidizing materials, halogen compounds, copper, zinc and galvanized metals.

10.6 Hazardous decomposition products

Carbon monoxide, carbon dioxide, ammonia, and oxides of nitrogen.

SECTION 11: Toxicological information

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 4 of 6



Information on toxicological effects

Acute toxicity

No data available.

Skin corrosion/irritation

No data available.

Serious eye damage/irritation

No data available.

Respiratory or skin sensitization

No data available.

Germ cell mutagenicity

No data available.

Carcinogenicity

This product's ingredients are not found in the federal or Cal OSHA NTP, or IARC lists of suspected cancer causing agents.

Reproductive toxicity

No data available.

STOT-single exposure

No data available.

STOT-repeated exposure

No data available.

Aspiration hazard

No data available.

SECTION 12: Ecological information

Toxicity

No data available.

Persistence and degradability

No data available.

Bioaccumulative potential

No data available.

Mobility in soil

No data available.

Results of PBT and vPvB assessment

No data available.

SECTION 13: Disposal considerations

Disposal of the product

Dispose of all waste in accordance with federal, state, and local regulations.

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 5 of 6

LA-UR-19-22215 Attachment E



Disposal of contaminated packaging

Dispose of as unused product.

Waste treatment

No data available.

Sewage disposal

No data available.

SECTION 14: Transport information

DOT (US)

UN Number: UN 1719

Class: 8

Packing Group: II

Proper Shipping Name: CAUSTIC ALKALI LIQUID, N.O.S.

Marine pollutant: No

Shipping Label: Corrosive - 8

Other Shipping Information: CONTAINS SODIUM HYDROXIDE, LIQUID



SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)
FIRE: NO PRESSURE GENERATING: NO REACTIVITY: NO ACUTE: YES CHRONIC: NO

SECTION 16: Other information

Further information/disclaimer

The information contained herein is provided in good faith and believed to be correct as of the date hereof. WEST, Inc. makes no representation as to the comprehensiveness or accuracy of the information. It is expected that the individuals receiving the information will exercise their independent judgment in determining its appropriateness for a particular purpose. Accordingly, WEST, Inc. will not be responsible for damages of any kind resulting in the use of or reliance upon such information. No representations, or warranties, either expressed or implied, of merchantability fitness for a particular purpose or of any other nature are made hereunder with respect to the information set fourth herein or to the product to which the information refers.

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 6 of 6



WEST R-630





HMS RATING: HEALTH 1 FLAMMABILITY 0 REACTIMTY 0 OTHER C

Safety Data Sheet WEST R-630

SECTION 1: Identification

1.1 Product identifier

Product name WEST R-630 Sulfite

Product number R-630

1.2 Recommended use An aqueous solution of sodium and potassium sulfites, bisulfites and

metabisulfites designed specifically for halogen removal in process water

systems.

1.3 Supplier's details

Signal word

Name Water & Energy Systems Technology, Inc.

Address 13109 Arctic Cr.

Santa Fe Springs, CA 90670

Telephone (562) 921-5191

1.4 Emergency phone number(s) Chem-Tel (U.S.): (800) 255-3924

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

GHS classification in accordance with OSHA (29 CFR 1910.1200)

Warning

- Skin corrosion/irritation (chapter 3.2), Cat. 3

Eye damage/irritation (chapter 3.3), Cat. 2B

2.2 GHS label elements, including precautionary statements

Hazard statement(s)	
H316	Causes mild skin irritation
H320	Causes eye irritation
Precautionary statement(s)	
P332+P313	If skin irritation occurs: Get medical advice/attention.
P264	Wash hands thoroughly after handling.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P337+P313	If eye irritation persists: Get medical advice/attention.

SECTION 3: Composition/information on ingredients

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 1 of 6



3.1 Mixtures

This product does not contain any hazardous materials under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

Trade secret statement (OSHA 1910.1200(i))

Specific chemical identity and/or exact percentage of composition has been withheld as a trade secret.

SECTION 4: First-aid measures

Description of necessary first-aid measures

General advice Avoid contact with skin, eyes and clothing. Wash hands before breaks and

immediately after handling the product.

If inhaled Remove to fresh air. If not breathing, give artificial respiration. Get immediate

medical attention.

In case of skin contact Immediately remove clothing under safety shower. Flush skin with large

amounts of soap and water. Wash clothing separately before reuse.

In case of eye contact Flush eye with water for 15 minutes. Get medical attention.

If swallowed Do NOT induce vomiting. Give victim large quantities of water. Call a

physician or poison control center immediately.

Personal protective equipment for first-aid responders

No data available.

4.2 Most important symptoms/effects, acute and delayed

No data available.

Indication of immediate medical attention and special treatment needed, if necessary

No data available.

SECTION 5: Fire-fighting measures

Suitable extinguishing media

No data available.

5.2 Specific hazards arising from the chemical

No data available.

Special protective actions for fire-fighters

No special fire fighting procedures.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Wear appropriate personal protective equipment as specified in Section 8.

Environmental precautions

Do not flush to sewer.

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 2 of 6



Methods and materials for containment and cleaning up

No data available.

SECTION 7: Handling and storage

Precautions for safe handling

Use with adequate ventilation. Follow all SDS/label precautions even after container is emptied because they may retain product residues.

Conditions for safe storage, including any incompatibilities

Contents may develop pressure upon prolonged storage. Loosen closure cautiously before opening.

SECTION 8: Exposure controls/personal protection

Control parameters

No exposure limits noted for ingredient(s).

Appropriate engineering controls

Local exhaust ventilation may be necessary to control any air containments to within their PELs (TLVs) during the use of this product.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear safety glasses with side shields (or goggles) and a face shield.

Skin protection

Nitrile rubber, PVC, or Neoprene gloves are suitable protective materials.

Body protection

Where splashing is possible, full chemically resistant protective clothing, rubber apron and boots are required.

Respiratory protection

NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited.

Thermal hazards

No data available

Environmental exposure controls

No data available.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Clear pink liquid Appearance/form No appreciable odor. Odor Odor threshold No data available.

~6.5 Melting point/freezing point No data available.

212 F

Initial boiling point and boiling range

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 3 of 6

LA-UR-19-22215 Attachment E



Flash point No data available. <1 (butyl acetate = 1) Evaporation rate Flammability (solid, gas) No data available. No data available. Vapor pressure Vapor density No data available. Relative density 1.251 Solubility(ies) Water Soluble Partition coefficient: n-octanol/water No data available. No data available. Auto-ignition temperature Decomposition temperature No data available. Viscosity No data available. Explosive properties No data available. Oxidizing properties No data available.

SECTION 10: Stability and reactivity

10.1 Reactivity

No data available.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available.

10.4 Conditions to avoid

Generation of heat by reaction with water or acids.

10.5 Incompatible materials

Acids, oxidizing materials, halogen compounds, copper, zinc and galvanized metals.

10.6 Hazardous decomposition products

Carbon monoxide, carbon dioxide, ammonia, and oxides of nitrogen.

SECTION 11: Toxicological information

Information on toxicological effects

Acute toxicity

No data available.

Skin corrosion/irritation

No data available.

Serious eye damage/irritation

No data available.

Respiratory or skin sensitization

No data available.

Germ cell mutagenicity

No data available.

Carcinogenicity

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 4 of 6



This product's ingredients are not found in the federal or Cal OSHA NTP, or IARC lists of suspected cancer causing agents.

Reproductive toxicity

No data available.

STOT-single exposure

No data available.

STOT-repeated exposure

No data available.

Aspiration hazard

No data available.

SECTION 12: Ecological information

Toxicity

No data available.

Persistence and degradability

No data available.

Bioaccumulative potential

No data available.

Mobility in soil

No data available.

Results of PBT and vPvB assessment

No data available.

SECTION 13: Disposal considerations

Disposal of the product

Dispose of all waste in accordance with federal, state, and local regulations.

Disposal of contaminated packaging

Dispose of as unused product.

Waste treatment

No data available.

Sewage disposal

No data available.

SECTION 14: Transport information

DOT (US)

Proper Shipping Name: D.O.T. NONREGULATED WATER TREATMENT LIQUID COMPOUND

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 5 of 6



SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT) FIRE: NO PRESSURE GENERATING: NO REACTIVITY: NO ACUTE: YES CHRONIC: NO

SECTION 16: Other information

Further information/disclaimer

The information contained herein is provided in good faith and believed to be correct as of the date hereof. WEST, Inc. makes no representation as to the comprehensiveness or accuracy of the information. It is expected that the individuals receiving the information will exercise their independent judgment in determining its appropriateness for a particular purpose. Accordingly, WEST, Inc. will not be responsible for damages of any kind resulting in the use of or reliance upon such information. No representations, or warranties, either expressed or implied, of merchantability fitness for a particular purpose or of any other nature are made hereunder with respect to the information set fourth herein or to the product to which the information refers.

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 6 of 6



BRIGHT DYES FLT YELLOW/GREEN LIQUID





Safety Data Sheet

Issue Date: 04-Oct-2013 Revision Date: 06-Feb-2017 Version Number: 1.1

1. Identification

Product Identifiers

Product Name: Bright Dyes® FLT Yellow/Green Liquid

Product Number: 106001

Recommended Use & Restrictions on Use

Water tracing & leak detection dye

Manufacturer/Supplier

Kingscote Chemicals, Inc. 3334 South Tech Blvd. Miamisburg, OH 45342

U.S.A.

Emergency Telephone Number

Company Telephone Number: (937) 886-9100

Emergency Telephone (24 hr): INFOTRAC (800) 535-5053 (North America)

+1-352-323-3500 (International)

2. Hazards Identification

Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least

15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs:

 ${\it Get medical advice/attention}.$

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek

medical attention immediately.

Page 1 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Liquid

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give

anything by mouth to an unconscious person. Get medical attention if large

quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation.

Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the

system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media

Water spray (fog). Carbon dioxide (CO2). Dry chemical. Regular foam.

Unsuitable Extinguishing Media

Not determined

Specific Hazards Arising from the Chemical

Product is not flammable. Burning/combustion may produce oxides of carbon and nitrogen (NOx).

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or

groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area

with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices.

Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing

should be thoroughly washed before reuse.

Page 2 of 6

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry, and well-

ventilated area. Keep from freezing.

Incompatible Materials Acids

8. Exposure Controls / Personal Protection

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection Goggles.

Skin & Body Protection Rubber gloves. Suitable protective clothing.

No protection is ordinarily required under normal conditions of use. **Respiratory Protection**

Hygiene Measures Handle in accordance with good industrial hygiene and safety practices.

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

Physical State Liquid Odor None apparent Yellow/green liquid **Appearance Odor Threshold** Not determined Color Yellow/green

Property Values >8.0 ~32° F Melting/Freezing Point ~212° F **Boiling Point/Range** Flash Point Not applicable

Evaporation Rate

Flammability (solid, gas) Liquid - not applicable **Upper Flammability Limits** Not applicable **Lower Flammability Limits** Not applicable **Vapor Pressure** Not applicable

Vapor Density 0.6

Relative Density Not applicable **Specific Gravity** Not determined Solubility Highly soluble in water **Partition Coefficient** Not determined Not determined Auto-ignition Temperature **Decomposition Temperature** Not determined Viscosity Not determined

Page 3 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Liquid

10. Stability and Reactivity

Reactivity

Not reactive under normal conditions.

Chemical Stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials

Acids. Strong oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation Avoid breathing vapors or mists.

Ingestion Do not ingest.

Skin Contact May cause an allergic skin reaction.

None

Eye Contact Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure

May cause an allergic skin reaction.

Numerical Measures of Toxicity

Not determined

Symptoms Associated with Exposure

See Section 4 of this SDS for symptoms.

Carcinogenicity

OSHA

NTP None

IARC None

Page 4 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Liquid

12. Ecological Information

Ecotoxicity

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Not available

Persistence/Degradability

Not determined

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. Disposal Considerations

Waste Disposal Methods

Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

Note

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

OMDG Not regulated

15: Regulatory Information

International Inventories

TASCA This product is not subject to TSCA 12(b) reporting requirements.

U.S. Federal Regulations

CERCLA This material, as supplied, does not contain any substances regulated as

hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Page 5 of 6



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization

Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of

Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants

pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable

state right-to-know regulations.

16: Other Information

	A CONTRACT OF THE CONTRACT OF		
HMIS Health Hazards	Flammability 0	Instability 0	Special Hazards Not determined
<u>NFPA</u> Health Hazards 1	Flammability 0	Physical Hazards O	Personal Protection B
Issue Date	04-Oct-2013		
Revision Date	06-Feb-2017		
Revision Note	Content Review		

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Page 6 of 6



BRIGHT DYES FLT YELLOW/GREEN TABLET





Safety Data Sheet

Issue Date: 09-Nov-2013 Revision Date: 06-Feb-2017 Version Number: 2.1

1. Identification

Product Identifiers

Product Name: Bright Dyes® FLT Yellow/Green Tablet

Product Number: 101101

Recommended Use & Restrictions on Use

Water tracing & leak detection dye

Manufacturer/Supplier

Kingscote Chemicals, Inc. 3334 South Tech Blvd. Miamisburg, OH 45342

U.S.A.

Emergency Telephone Number

Company Telephone Number: (937) 886-9100

Emergency Telephone (24 hr): INFOTRAC (800) 535-5053 (North America)

+1-352-323-3500 (International)

2. Hazards Identification

Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least

15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs:

Get medical advice/attention.

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek

medical attention immediately.

Page 1 of 6



Revision Date: 06-Feb-2017

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give

anything by mouth to an unconscious person. Get medical attention if large

quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation.

Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the

system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media

Water spray (fog). Carbon dioxide (CO2). Dry chemical.

Unsuitable Extinguishing Media

Not determined

Specific Hazards Arising from the Chemical

Remote possibility of dust explosion. Burning may produce oxides of carbon and nitrogen (NOx).

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or

groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area

with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices.

Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing

should not be allowed out of the workplace.

Page 2 of 6

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



Revision Date: 06-Feb-2017

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry, and well-

ventilated area. Store away from heat, sparks, open flame or any other

ignition source.

Incompatible Materials Bromine trifluoride. Lithium. Strong acids, bases, and oxidizing agents.

8. Exposure Controls / Personal Protection

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection Avoid contact with eyes.

Skin & Body Protection Rubber gloves. Suitable protective clothing.

Respiratory Protection Use NIOSH-approved dust mask if dusty conditions exist.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practices.

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

Physical StateSolidOdorNone apparentAppearanceOrange tabletOdor ThresholdNot determined

Color Orange

Property **Values** Not applicable pН Melting/Freezing Point Not applicable Not applicable **Boiling Point/Range** Flash Point Not applicable Not applicable **Evaporation Rate** Flammability (solid, gas) Not flammable **Upper Flammability Limits** Not applicable **Lower Flammability Limits** Not applicable Vapor Pressure Not applicable Vapor Density Not applicable Not applicable **Relative Density Specific Gravity** Not applicable

Solubility Highly soluble in water with small amounts of insoluble residue

 Partition Coefficient
 Not determined

 Auto-ignition Temperature
 Not determined

 Decomposition Temperature
 Not determined

 Viscosity
 Not determined

Page 3 of 6



Revision Date: 06-Feb-2017

10. Stability and Reactivity

Reactivity

Not reactive under normal conditions.

Chemical Stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials

Bromine trifluoride. Lithium. Strong acids, bases, and oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation Avoid inhalation of dust.

Ingestion Do not ingest.

Skin Contact May cause an allergic skin reaction.

Eye Contact Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure

May cause an allergic skin reaction.

Numerical Measures of Toxicity

Not determined

Symptoms Associated with Exposure

See Section 4 of this SDS for symptoms.

Carcinogenicity

NTP None

IARC None

OSHA None

Page 4 of 6



Revision Date: 06-Feb-2017

12. Ecological Information

Ecotoxicity

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Not available

Persistence/Degradability

This product is biodegradable.

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. Disposal Considerations

Waste Disposal Methods

Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

Note

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

OMDG Not regulated

15: Regulatory Information

International Inventories

Not determined

U.S. Federal Regulations

CERCLA This material, as supplied, does not contain any substances regulated as

hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Page 5 of 6



Revision Date: 06-Feb-2017

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization

Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of

Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants

pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable

state right-to-know regulations.

16: Other Information

<u>HMIS</u> Health Hazards 1	Flammability O	Instability O	Special Hazards Not determined	
<u>NFPA</u> Health Hazards 1	Flammability 0	Physical Hazards O	Personal Protection B	
Issue Date	09-Nov-2013			
Revision Date	06-Feb-2017	06-Feb-2017		
Revision Note	Content Review			

<u>Disclaimer</u>

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End of Safety Data Sheet

Page 6 of 6



Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application Outfall 001 Fact Sheet

Utilities and Infrastructure (U&I)

Power Plant, Sanitary Wastewater System (SWWS) Facility, Sanitary Effluent Reclamation Facility (SERF), and Strategic Computing Complex (SCC) Cooling Towers





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Table of Contents

1.0	OUTFALL LOCATION [Section I]	5
2.0	FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]	5
2.1	Process Schematic and Water Balance [II.A]	5
2.2	Water Treatment Processes [II.B]	5
2.3	Discharge Rate and Frequency [II.C]	9
3.0	PRODUCTION [Section III]	9
4.0	IMPROVEMENTS [Section IV]	10
5.0	INTAKE AND EFFLUENT CHARACTERISTICS [Section V]	10
5.1	Analytical Data [V.A, B, and C]	10
5.2	Potential Pollutants [V.D]	10
6.0	POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]	12
7.0	BIOLOGICAL TOXICITY TESTING DATA [Section VII]	12
8.0	CONTRACT ANALYSIS INFORMATION [Section VIII]	12
ATTAC	CHMENT A: Location Map for Outfall 001	A-1
ATTAC	CHMENT B: Process Schematics and Water Balances for Outfall 001 Discharges	B-1
ATTAC	CHMENT C: Photographs	C-1
ATTAC	CHMENT D: Discharge Monitoring Report (DMR) Summary October 2014 – September 2018	D-1
ATTAC	CHMENT E: Safety Data Sheets	E-1

List of Tables

- 1 Sources for Discharges to Outfall 001
- 2 Wastewater Treatment Codes Assigned to Outfall 001
- 3 List of Treatment Chemicals used in the Operations that Contribute to Outfall 001
- 4 Rates and Frequencies for Discharge Sources to Outfall 001
- 5 Potential Future Flow Rates and Frequencies for Discharges to Outfall 001
- 6 Potential Pollutants by Source for Outfall 001
- 7 List of Independent Laboratories Used for NPDES Water Analysis



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INDUSTRIAL AND SANITARY OUTFALLS 2019 NPDES PERMIT RE-APPLICATION OUTFALL 001 FACT SHEET

1.0 OUTFALL LOCATION [Section I]

Outfall ID No.:	001	Outfall Location:	Technical Area 3
Category:	Power Plant Discharges	Originating Structure	TA-3-22, Power Plant
	_	for the Discharge:	
Flow Type:	Continuous	Receiving Stream: Perennial Reach of Sandia Canyon, Water	
		_	Quality Segment 20.6.4.126 NMAC
Longitude:	106° 19' 09" W	Latitude:	35° 52' 26" N

2.0 FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]

Outfall 001 is located at Technical Area (TA) 3 and discharges to a perennial reach of Sandia Canyon in Water Quality Segment 20.6.4.126 NMAC. The outfall discharges cooling water from the power plant, treated sanitary wastewater effluent from the Sanitary Wastewater System (SWWS) Facility, recycled sanitary effluent from the Sanitary Effluent Reclamation Facility (SERF), and treated cooling tower blowdown from the Strategic Computing Complex (SCC). Attachment A provides a location map. Table 1 identifies the discharge sources, locations, and composition.

	Table 1 Sources for Discharges to Outfall 001					
TA	Building	Source Type	Transportation Mode (Piping, Truck etc.)	Discharge Source	Source Composition	
3	22, 24, 336, 592	Cooling	Piping	Power Plant	Once Through Cooling Water	
46	333, 334,431, 336, 335, 337, 338, 375, 347, 339, 340, 477	Sanitary	Piping	SWWS Facility	Treated Sanitary Effluent from SWWS	
3	1398, 3093, 3085	Process	Piping	SERF	Treated SERF Effluent	
3	2327	Cooling	Piping	SCC Cooling Towers	Treated Cooling Tower Blowdown Potable Water Used as Makeup Water SERF Effluent Used as Makeup Water - SERF Treatment Chemicals - SWWS Facility Treatment Chemicals and Chemicals identified on Influent Waste Stream Profile Forms	

SCC = Strategic Computing Complex; SERF = Sanitary Effluent Reclamation Facility; SWWS = Sanitary Wastewater System

2.1 Process Schematic and Water Balance [II.A]

A process schematic line drawing that shows the outfall sources and route taken by water is provided in Attachment B. This drawing includes all operations that contribute process, sanitary, and/or cooling water to the discharge at Outfall 001. A water balance is also provided on the process schematic with daily average flows. The water balance is based upon data collected from operations personnel.

2.2 Water Treatment Processes [II.B]

The following bullets provide a description of the facilities with water treatment processes that discharge to Outfall 001:

1. Power Plant: The Co-Generation Power and Steam Plant provides steam heating to most of the buildings at TA-3. Makeup water is supplied to the pump/fan bearings to provide once through cooling. The cooling water is routed to the power plant cooling towers and allowed to cool. There are currently no chemicals added to the makeup water or cooling towers. The cooled water overflows from the cooling tower basin and is routed to Manhole A and de-

chlorinated prior to discharge to Outfall 001. A schematic for the operations at the power plant is provided in Attachment B and photographs are provided in Attachment C.

- 2. Sanitary Wastewater System (SWWS): The SWWS Facility treats sanitary wastewater, process water, and cooling water discharged to the sanitary sewer and/or collected in storage containers/tanks from all technical areas at the Laboratory. All wastewater discharged to the SWWS Facility for treatment must comply with the facility's Waste Acceptance Criteria and, if it is something other than sanitary waste (i.e., cooling water, process water), must have a completed/approved Waste Stream Profile Form. The following bullets summarize the treatment process at the SWWS Facility.
 - 1. Wastewater flows to the SWWS Facility by gravity through the collection system and into a mechanical Bar Screen that is used to remove large inert solids (i.e., gloves, mop strings, paper towels, sand, asphalt, gravel) from the wastewater prior to treatment. This protects the pumps, valves, pipelines, and other downstream appurtenances from damage and/or clogging.
 - 2. The screened wastewater from the mechanical bar screen is routed through a Grit Chamber to remove heavy suspended solids such as sand, gravel, seeds, and coffee grounds from the wastewater. Wastewater from the grit chamber is routed to a splitter box where glycerin and soda ash are added. The glycerin is used to provide a carbon food source to the microorganisms and the soda ash is used to adjust the alkalinity. The wastewater from the splitter box is routed to the Equalization Basins (2) to stabilize the flow of wastewater being treated through the facility.
 - 3. Wastewater from the Equalization Basins (2) is routed to the Aeration Basins (4) and sparged/mixed with air at different rates to mix the water with microorganisms and promote biological growth. Dog food is added to the Aeration Basis to promote microorganism health and growth as needed. From the Aerations Basins the wastewater is routed to the Secondary Clarifiers. At this time one clarifier is being used as a Digester (for waste microorganisms) and the second is used as a Clarifier.
 - 4. Clarified water is routed to the Chlorine Contact Chamber to be disinfected. The chlorine is generated by a mixed oxidant (MIOX) treatment unit that uses brine water and electrophoresis to create a mixed oxidant solution that is used for disinfection.
 - 5. Disinfected water is discharged from the chlorine contact chamber to the Effluent Holding Pond for storage until it can be pumped to the Reuse Tank at the Power Plant or discharged to Outfall 13S.
 - 6. Disinfected water that is discharged to an outfall is disinfected as follows:
 - Disinfected water pumped to the Reuse Tank is dechlorinated at the Power Plant Manhole A as it is discharged to Outfall 001.
 - Disinfected water will be dechlorinated at the SWWS Facility ONLY if it is discharged to Outfall 13S.
 - 7. Secondary wastewater, sludge, debris, and solids generated due to treatment at the SWWS Facility are managed as follows:
 - Solids from the bar screen and grit chamber are removed and disposed of at an approved landfill.
 - Waste sludge (from the clarifier and/or digester) is mixed with a polymer to help flocculate the sludge into large pieces, and discharged to the sludge drying beds. Decanted water from the digester and/or sludge drying beds is recycled to the head works for treatment. Dried sludge is either composted and land applied or packaged into roll off bins and shipped to an approved landfill.

NOTE: The land application of compost (biosolids) at LANL is subject to 40 CFR Part 503 Subpart B and Part IV of LANL's NPDES Industrial Outfall Permit NM0028355 — Sewage Sludge Requirements. Biosolids applied to land must meet risk-based pollutant limits specified in Part 503. Operational standards to control disease-causing organisms (pathogens) and reduce the attraction of vectors (e.g., flies and mosquitoes) to biosolids must also be met. The SWWS Compost Facility is registered pursuant to the requirements in 20.9.3.27 NMAC under Certificate No. 0215151C.

See the permit section provided for Outfall 13S for a schematic and photographs for the operations at the SWWS Facility.

• Sanitary Effluent Reclamation Facility (SERF): The SERF provides tertiary treatment of Treated SWWS effluent so that it can be reused/recycled as makeup water in the cooling towers at the Laboratory. The SWWS effluent is collected in the Reuse Tank located at the Power Plant where routed to SERF. At the SERF the SWWS effluent is treated to remove naturally occurring silica using precipitation, pH control, microfilters, and reverse osmosis. The treated water is stored in a tank and then blended with untreated SWWS effluent prior to being discharged to Outfall 001 and/or to the SCC Cooling Towers for use as makeup water. At the SCC Cooling Towers the SERF Effluent is used as makeup water and circulated through the towers, chillers, and then blown down to Outfall 03A027 and/or to Outfall 001. The blowdown can also be discharged to the SWWS Facility or back to the SERF for treatment. A schematic for the operations at the SERF Facility are provided in Attachment B and photographs are provided in Attachment C.

Strategic Computing Complex (SCC): The SCC currently has ten cooling towers that provide cooling water to the chillers and heat exchangers to support cooling of computers, equipment, and the building office areas. Makeup water is fed to the tower basins, circulated through the facility chillers and heat exchangers, and routed back to the cooling towers approximately 2-3 times before it is blown down and recharged with fresh makeup water. The cooling towers are maintained by two identical water treatment systems that draw a small amount of water from the basin discharge line (for circulation and/or blowdown) into a process logic controller and monitoring system to determine conductivity and chlorine content. This system determines the amount of water treatment chemicals and makeup water added to the tower basins. It also determines the amount and rate of blowdown from the tower. Table 2 identifies the wastewater treatment codes associated with the water treatment system. See the permit section provided for Outfall 03A027 for a schematic and photographs for the operations at the SWWS Facility.

	Table 2 Wastewater Treatment Codes Assigned to Outfall 001					
Source	Treatme nt Code	Description	Justification			
Power Plant	2-E	Dechlorination	Chlorine Scavenger is added to Manhole A at the Power Plant			
SWWS	1-M	Grit Removal	Grit Chamber			
Facility	1-0	Mixing	Grit Chamber with Splinter Box			
	1-T	Screening	Use of Bar Screen to Remove Solids			
	1-U	Sedimentation (settling)	Sludge is Settled in Clarifier and Digester			
	2-E	Dechlorination	Dechlorination chemical (SO2) used at SWWS if effluent is discharged to Outfall 13S			
	2-F	Disinfection (chlorine)	Chlorine is Generated Using a MIOX System			
	3-A	Activated Sludge	Activated Sludge is Used to Treat Water			
	3-E	Pre-Aeration	Aeration Basins			
	5-G	Composting	Composting of Sludge			
	5-H	Drying Beds	Sludge Drying Beds on Site			
	5-Q	Landfill	Sludge is disposed of at an Approved Landfill or Land Applied. Screened solids are disposed of at an approved Landfill.			
SERF	1-F	Evaporation	RO Concentrate that Cannot be reused			
	1-S	Reverse Osmosis (Hyper-filtration)	Secondary Filtration/Polish of SWWS Effluent for Reuse			
	2-C	Chemical Precipitation	Treatment of SWWS Effluent			
	2-E	Dechlorination	Chlorine Scavenger Chemical is added to maintain the RO units at SERF			
	2-K	Neutralization	Adjust pH Prior to treatment in the RO Units			
	2-L	Reduction	Corrosion Inhibitor is Added to SERF Effluent prior to Pumping it for Reuse at the SCC Cooling Towers			
	4-C	Reuse/Recycle of Treated Effluent	SWWS Effluent is treated at SERF and reused/recycled in the SCC Cooling Towers.			
	5-Q	Landfill	Sludge and Solids from SWWS and SERF disposed of at an Approved Landfill			
	5-R	Pressure Filtration	Solids Dewatering			

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	Table 2 Wastewater Treatment Codes Assigned to Outfall 001					
Source Treatme Description Justification						
SCC	2-E	Dechlorination	Chlorine Scavenger Chemicals are Added			
Cooling 2-H Disinfection (other) Chemicals are added to Control Microorganisms						
Towers	2-L	Reduction	Chemicals that are Antiscalant and Corrosion Inhibitors are Added			

MIOX = mixed oxidation; RO = reverse osmosis; SCC = Strategic Computing Complex; SERF = Sanitary Effluent Reclamation Facility; SWWS = Sanitary Wastewater System

The water treatment processes identified in Table 2 utilize the chemicals identified in Table 3.

Table 3 List of Treatment Chemicals used in the Operations that Contribute to Outfall 001						
Source	Chemical Name	Reason for Use	Toxic Pollutant and/or Hazardous Substances Table 2C-3 or 2C-4			
Power Plant	Nalco 7408	Chlorine Scavenger Dechlorination	Sodium bisulfite	2C-4		
	Bright Dyes FLT Yellow/Green Liquid	Water Line & Drain Tracing Dye	NA	NA		
	Bright Dyes FLT Yellow/Green Tablet	Water Line & Drain Tracing Dye	NA	NA		
SWWS	Clarifloc C-6265	Polymer Flocculation Agent	NA	NA		
Facility ^a	Dog Food	Food Source for Microorganisms	NA	NA		
•	Glycerin	Carbon Source for Microorganisms	NA	NA		
	Sodium Bisulfite	Dechlorination	sodium bisulfite	2C-4		
	Soda Ash	Add Alkalinity	NA	NA		
	Sodium Chloride	Chlorine Source for Disinfection Using the MIOX System	Chlorine	2C-4		
	Sulfur Dioxide	Dechlorination	NA	NA		
	Bright Dyes FLT Yellow/Green Liquid	Water Line & Drain Tracing Dye	NA	NA		
	Bright Dyes FLT Water Line & Drain Tracing Dye Yellow/Green Tablet		NA	NA		
SERF	40% Ferric Chloride	Promote Precipitation	Ferric Chloride	2C-4		
	25% Magnesium Chloride Promote Precipitation		Magnesium Chloride	NA		
	33% Hydrochloric Acid	pH Adjustment	Hydrochloric Acid	2C-4		
	35% Sodium Hypochlorite	Clean/Disinfect RO Units	Sodium Hypochlorite	2C-4		
	25% Sodium Hydroxide	pH Adjustment	Sodium Hydroxide	2C-4		
	38% Sodium Bisulfite	Injected prior to the RO Unit as a de-chlorinating Agent.	Sodium Bisulfite	2C-4		
	Perma Treat PC-510T	RO Unit Antiscalant Polymer	Sodium Nitrite	2C-4		
	Bright Dyes FLT Yellow/Green Liquid	Water Line & Drain Tracing Dye	NA	NA		
	Bright Dyes FLT Yellow/Green Tablet Water Line & Drain Tracing Dy		NA	NA		
SCC Cooling Towers ^b	Bromine Tablets	Biocide	Bromo-chloro-5,5-dimethyl hydantoin (chlorine source)	2C-4		
	HACH 203832	Sulfuric Acid Solution 19.2 N	Sulfuric Acid	2C-4		
	HACH 1407028	Free Chorine Reagent	Sodium Phosphate Dibasic EDTA	2C-4 2C-4		
	HACH 2076053	Molybdovanadate Reagent	Sulfuric Acid	2C-4		
	HACH 2105669	Total Chlorine Reagent	Sodium Phosphate Dibasic	2C-4		
	HACH 2263411	Total Chlorine Indicator	Sulfuric Acid	2C-4		
	HACH 2263511	Total Chlorine Buffer Solution	Sodium Hydroxide	2C-4		
	1.7.0112200011	Total Officiale Ballot Goldfort	EDTA	2C-4		

	Table 3 List of Treatment Chemicals used in the Operations that Contribute to Outfall 001						
Source	Chemical Name	Toxic Pollutant and/or Haz Substances Table 2C-3 or	itant and/or Hazardous				
	HACH 2297255	Compound for Free and Total Chlorine Analyzers	NA	NA			
	HACH 2314011	Free Chlorine Indicator Solution for CL-17 Analyzer	Toluene	2C-4			
	HACH 2314111	Free Chlorine Buffer for CL-117 Analyzer	NA	NA			
	HACH 2756549 pH Storage Solution		Sodium Phosphate Dibasic	2C-4			
	WEST C-358P	Corrosion Inhibitor and Antiscalant	Potassium Hydroxide	2C-4			
	WEST C-825	pH control (neutralization)	Sodium Bisulfite	2C-4			
	WEST R-630	De-Chlorination	Sodium Bisulfite	2C-4			
	Bright Dyes FLT	Water Line & Drain Tracing Dye	NA	NA			
	Yellow/Green Liquid						
	Bright Dyes FLT Yellow/Green Tablet	Water Line & Drain Tracing Dye	NA	NA			

- a. See the permit application section provided for Outfall 13S for the Safety Data Sheets associated with SWWS.
- See the permit application section provided for Outfall 03A027 for the Safety Data Sheets associated with the SCC Cooling Towers.

EDTA = Ethylene Diamine Tetraacetic Acid; MIOX = mixed oxidation; RO = reverse osmosis; SCC = Strategic Computing Complex; SERF = Sanitary Effluent Reclamation Facility; SWWS = Sanitary Wastewater System

2.3 Discharge Rate and Frequency [II.C]

The discharge rates and frequencies for Outfall 001 and its sources are provided in Table 4.

Table 4 Rates and Frequencies for Discharge Sources to Outfall 001							
	Frequency			Flow Rates and Volumes			
Source ^a	Days/Week	Months	Average (MGD)	Maximum (MGD)	Average Volume (GPD)	Maximum Volume (GPD)	Duration (days)
Power Plant	7	12	0.050	0.195	49,652	194,524	365
SWWS Facility b, c	7	12	0.026	0.209	26,432	209,173	365
SERF	7	12	0.040	0.122	39,807	121,914	365
SCC Cooling Towers d, e	7	12	0.051	0.105	50,679	104,804	365
Total Outfall 001	7	12	0.154	0.333	153,931	332,600	365

- a. Calculated between October 2017 and September 2018.
- b. The average volume of SWWS effluent discharged to Outfall 001 is significantly less on average due to reuse at the SCC after being treated at SERF.
- c. See the permit section provided for Outfall 13S for a schematic.
- d. Cooling tower blowdown calculated for the operation of 10 cooling towers.
- e. See the permit section provided for Outfall 03A027 for a schematic.

GPD = gallons per day; MGD = million gallons per day; SCC = Strategic Computing Complex; SERF = Sanitary Effluent Reclamation Facility; SWWS = Sanitary Wastewater System

3.0 PRODUCTION [Section III]

Section III is not applicable to Outfall 001.

4.0 IMPROVEMENTS [Section IV]

The following future changes may impact the flow rate and composition of Consolidated Outfall 001 after the NPDES 2019 Permit Reapplication is submitted and/or the new permit is implemented:

- The SCC is currently adding 5 more cooling towers to its cooling system. These towers will utilize the existing water treatment system and makeup water supply as described in Section 2.2 and the fact sheet for Outfall 03A027. See the fact sheet provided for Outfall 03A027 for a schematic of the change. This project is currently under construction.
- Future changes to Outfall 001 may include the routing of the TA-55 Cooling Tower blowdown, currently discharging through Outfall 03A181, to the Reuse Tank at TA-3. If implemented, the discharge will either be recycled to SERF or discharged to Outfall 001. See the fact sheet provided for Outfall 03A181 for a schematic of the change. This project has not been started and is not yet scheduled.

A Notice of Change will be submitted for these future changes prior to their implementation and impact to the outfall. Table 5 provides an estimate for the future flow rates and frequencies should these projects be implemented. Attachment B provides a proposed schematics and water balance information for each of the future configurations.

Table 5 Potential New Future Flow Rates and Frequencies for Discharges to Outfall 001							
Potential Future Source	Frequency		Flow Rates and Volumes				
	Days/Week	Months	Average (MGD)	Maximum (MGD)	Average Volume (GPD)	Maximum Volume (GPD)	Duration (days)
SCC Cooling Towers a, b	7.0	12	0.074	0.201	74,436	201,056	365
TA-55-006 Cooling Towers ^c	7.0	12	0.009	0.032	9,365	31,986	365
Future Outfall 001	7.0	12	0.199	0.439	199,320	438,586	365

- a. See the permit section provided for Outfall 03A027 for a schematic showing this change.
- b. Cooling tower blowdown calculated for the operation of 15 towers.
- c. See the permit section provided for Outfall 03A181 for a schematic showing this change.

GPD = gallons per day; MGD = million gallons per day; SCC = Strategic Computing Complex; LDCC = Laboratory Data Communications Center

5.0 INTAKE AND EFFLUENT CHARACTERISTICS [Section V]

5.1 Analytical Data [V.A, B, and C]

The analytical results provided for the Outfall 001 Permit Reapplication on the Form 2C were provided from the following sources:

- Samples collected on August 21, 2018 August 23, 2018 that were shipped to an independent laboratory for analysis.
- Field samples collected and analyzed on August 21, 2018 August 23, 2018 for temperature, residual chlorine, and pH.
- Field samples collected and analyzed on January 15, 2018 for sulfite.
- Discharge monitoring report summary for Outfall 001 from October 2014 to September 2018 (Attachment D).
- Hardness = 37.5 mg/L (CaCO₃)

5.2 Potential Pollutants [V.D]

The treatment chemicals associated with the water treatment operations at the power plant, SWWS, SERF, and the SCC Cooling Towers constitute the potential pollutant load of the discharges to Outfall 001. Table 6 identifies the Table 2C-3 and 2C-4 pollutants by discharge source. It also identifies those pollutants (if any) that were detected in the analytical results from the samples collected for the 2019 Permit Renewal Application.



	Table 6 Potential Pollutants by Sour	rco for Outfall (001
Source Description	POTENTIAL Toxic Pollutant and/or F Substances Table 2C-	lazardous	Analytical Data Results from Outfall 001 ^a
Power Plant	Sodium Bisulfite	2C-4	Sulfite = 1 mg/L
SWWS Facility Treatment	Chlorine	2C-4 2C-4	Residual Chlorine = 0
Chemicals	Sodium Bisulfite	2C-4 2C-4	Sulfite = 1 mg/L
SWWS Chemicals identified on		2C-4 2C-4	
Influent Waste Stream Profile	Acetic Acid Acetone		pH = 7 to 8.5 S.U.
Forms		2C-4	Not Analyzed °
FOITIS	Ammonia	2C-4	0.207 mg/L
	Aniline	2C-3 & 2C-4	Not Analyzed °
	Benzene	2C-4	1.81 ug/L
	Benzoic Acid	2C-4	pH = 7 to 8.5 S.U.
	Calcium Hypochlorite	2C-4	Chloride = 45.5 mg/L
	Carbon Disulfide	2C-3 & 2C-4	Not Analyzed c
	Chlorine	2C-4	Residual chlorine = 0
	Chloroform	2C-4	0.82 ug/L
	Cresol	2C-3 & 2C-4	Not Analyzed ^c
	Ethylbenzene	2C-4	Not Detected (VOC)
	Polychlorinated Biphenyls ^b	2C-4	Not Detected
	Phenol	2C-4	Not Detected (SVOC)
	Phosphoric Acid	2C-4	pH = 7 to 8.5 S.U.
			Total Phosphorus = 1.83 mg/L
	Potassium Hydroxide	2C-4	pH = 7 to 8.5 S.U.
	Sodium	2C-4	Not Analyzed ^c
	Sodium Bisulfite	2C-4	Sulfite = 1 mg/L
	Sodium Hydroxide	2C-4	pH = 7 to 8.5 S.U.
	Sodium Hypochlorite	2C-4	Chloride = 45.5 mg/L
	Sodium Nitrite	2C-4	Nitrate/nitrite = 1.69 mg/L
	Strontium	2C-3	Not Analyzed ^c
	Styrene	2C-3 & 2C-4	Not Analyzed ^c
	Toluene	2C-4	Not Detected (VOC)
	Uranium	2C-3	Not Analyzed ^c
	Vanadium	2C-3	Not Analyzed ^c
SERF Treatment Chemicals	Ferric Chloride	2C-4	Chloride = 45.5 mg/L
_			Iron = 37.9 mg/L
	Hydrochloric Acid	2C-4	pH = 7 to 8.5 S.U.
	Magnesium Chloride	2C-4	Magnesium = 2,930 mg/L
	9		Chloride = 45.5 mg/L
	Sodium Bisulfite	2C-4	Sulfite = 1 mg/L
	Sodium Hydroxide	2C-4	pH = 7 to 8.5 S.U.
	Sodium Hypochlorite	2C-4	Chloride = 45.5 mg/L
	Sodium Nitrite	2C-4	Nitrate/Nitrite = 1.69 mg/L
SCC Cooling Towers Treatment	EDTA	2C-4	pH = 7 to 8.5 S.U.
Chemicals	Potassium Hydroxide	2C-4	pH = 7 to 8.5 S.U.
Chambalo	Sodium Bisulfite	2C-4	Sulfite = 1 mg/L
	Sodium Hydroxide	2C-4 2C-4	pH = 7 to 8.5 S.U.
	Sodium Phosphate Dibasic	2C-4 2C-4	Total Phosphorus = 1.83 mg/L
	Sulfuric Acid	2C-4 2C-4	
			pH = 7 to 8.5 S.U.
	Toluene	2C-4	Not Detected (VOC)
	Chlorine	2C-4	Total Residual Chlorine = 0

a. Results are from the representative sample collected at Outfall 001 on August 21, 2018 – August 23, 2019.

EPA ID No. NM0890010515

	Table 6	
	Potential Pollutants by Source for Outfall (001
Source	POTENTIAL	Analytical Data
Description	Toxic Pollutant and/or Hazardous	Results from Outfall 001 ^a
	Substances Table 2C-3 or 2C-4	

b. Results were obtained using the EPA Aroclor Method 608.3 as required by the Form 2C. Low concentrations of PCBs have been detected in the discharged to Outfall 001 using the Congener Method. These results are provided with the DMR Summary provided in Attachment D.

EDTA = Ethylene Diamine Tetra-Acetic Acid; PCB = polychlorinated biphenyls; SCC = Strategic Computing Center; SERF = Sanitary Effluent Reclamation Facility; SVOC = semi-volatile organic compounds; S.U. = Standard Units; SWWS = Sanitary Wastewater System; VOC = Volatile Organic Compound

The safety data sheets associated with the chemicals used to treat water at the Power Plant, SWWS, SERF, and SCC are provided in Attachment E.

6.0 POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]

Section VI is not applicable to Outfall 001.

7.0 BIOLOGICAL TOXICITY TESTING DATA [Section VII]

Whole Effluent Toxicity (WET) 7 Day Chronic Toxicity was performed on May 23, 25, and 27 of 2015 to determine the results at a critical dilution of 100% using a dilution series of 32%, 42%, 56%, 75%, and 100%. The WET including the following criteria as required by the permit:

- Ceriodaphnia dubia, 24-hr composite, 1/5 Years (term)
- Pimephales promelas, 24-hr composite, 1/5 Years (term)

The WET test results indicated that the effluent from Outfall 001 passed the test for Pimephales promelas and no further testing has been performed. The effluent did not pass the test for reproduction of Ceriodaphnia dubia which required that additional testing be performed. See the WET Test Summary Report provided in Attachment D of the Fact Sheet provided with the permit application.

8.0 CONTRACT ANALYSIS INFORMATION [Section VIII]

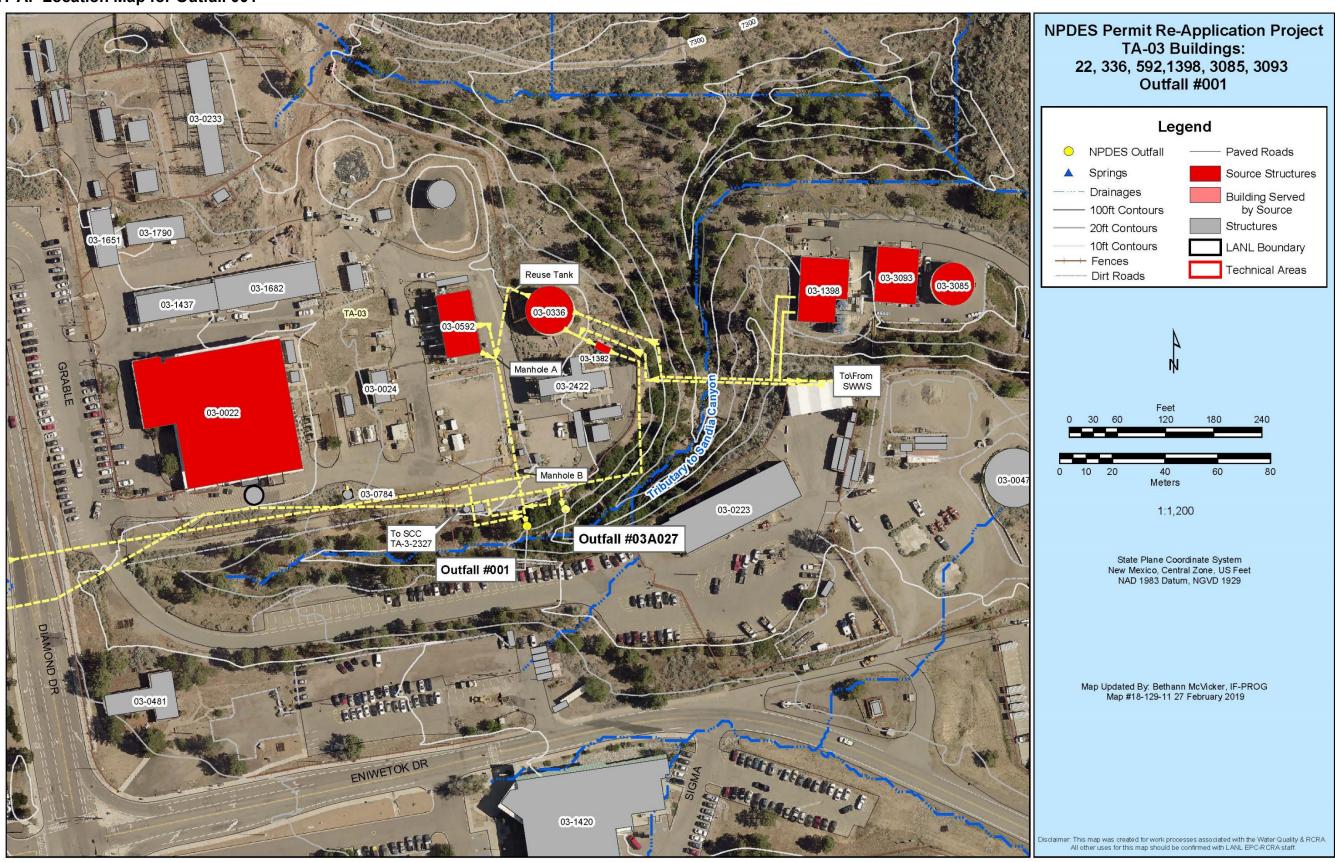
Samples from Outfall 001 were collected on August 21, 2018 – August 23, 2018 for the Form 2C constituents required by the permit application forms. These samples were field analyzed and/or submitted to independent laboratories (Table 7) as summarized in Section 5.1.

	- ·	able 7 es Used for NPDES Water Analysis
Laboratory Name	Address and Contact Info	Analytes
GEL Laboratories LLC	2040 Savage Road Charleston SC 29407 (843) 556-8171	Biological Oxygen Demand, General Chemistry, Pesticides, Polychlorinated Biphenyls, Radiochemistry, Semi-volatile Organic Compounds, Total Metals, Total Suspended Solids, Volatile Organic Compounds
New Mexico Water Testing Laboratory, Inc.	401 North Coronado Ave Espanola, NM 87532 (505) 929-4545	E.coli
Cape Fear Analytical LLC	3306 Kitty Hawk Road Suite 120 Wilmington, NC 28405 (910) 795-0421	TCDD (Dioxin)
Pacific EcoRisk	2250 Cordelia Rd. Fairfield, CA 94534 (707) 207-7760	Whole Effluent Toxicity

c. The potential pollutant was not analyzed because it is not specifically called out on the Form 2C.

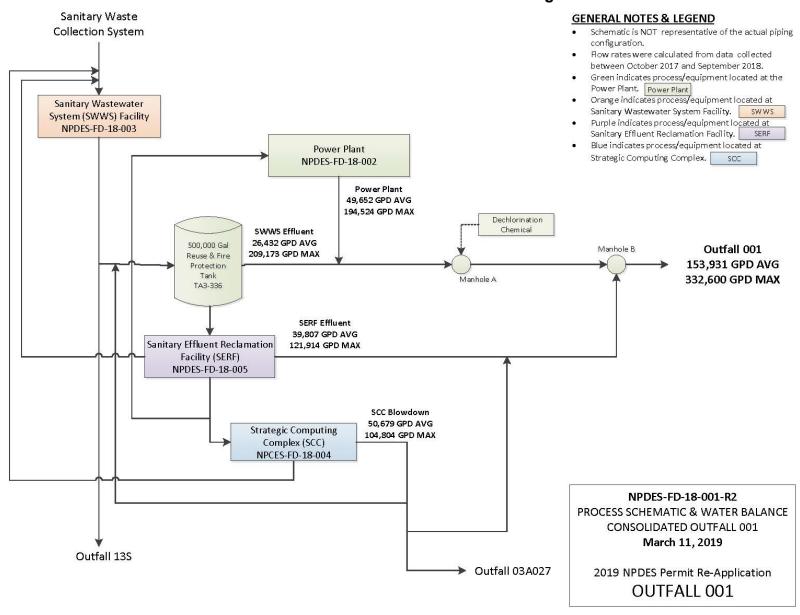


ATTACHMENT A: Location Map for Outfall 001

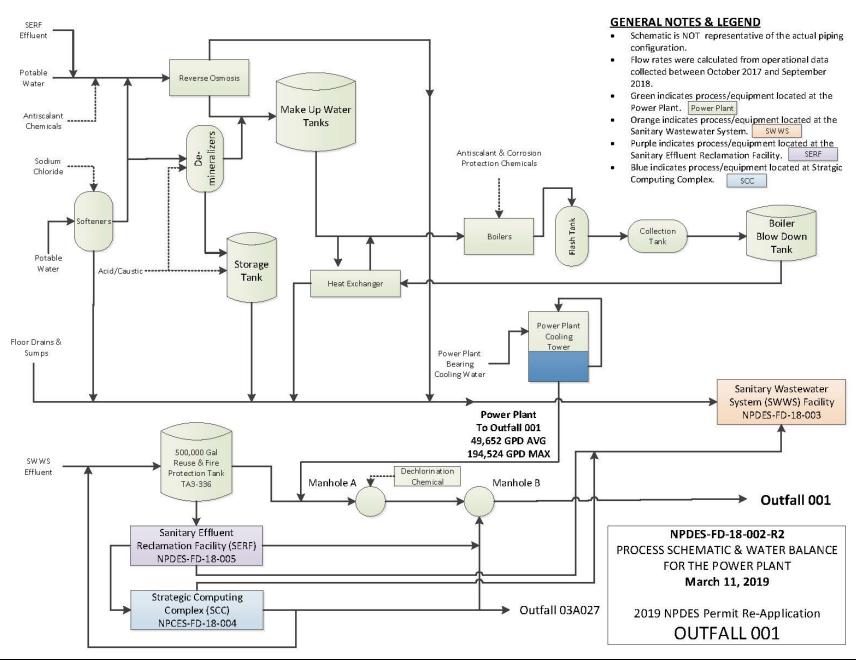




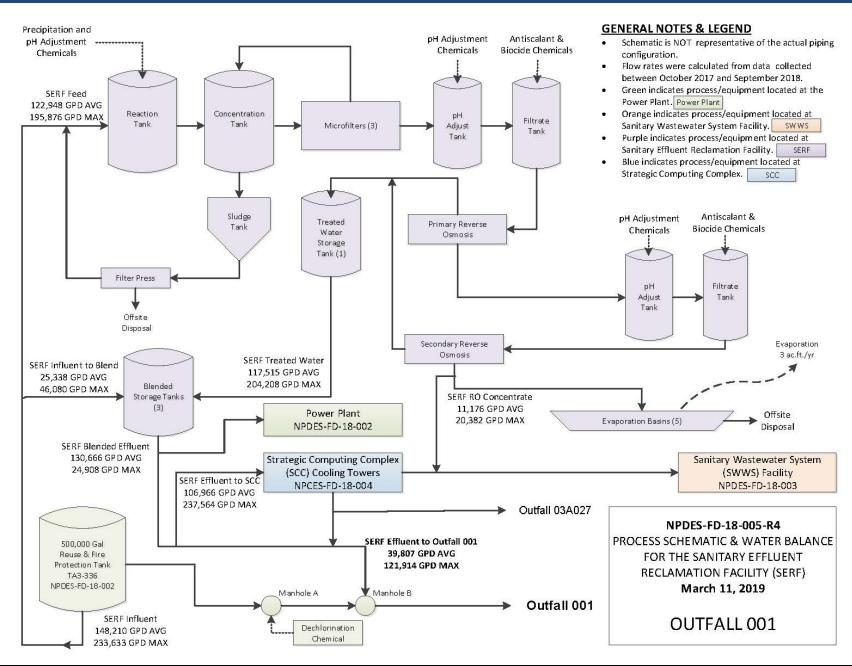
ATTACHMENT B: Process Schematics and Water Balances for Outfall 001 Discharges















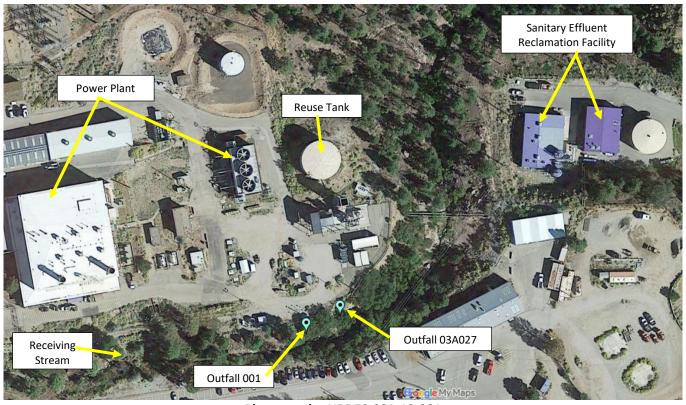
ATTACHMENT C: Photographs

Photograph ID No.	Photograph Title
NPDES-001-18-001	Outfall 001 Location
NPDES-001-18-002	Outfall 001 Condition from Above
NPDES-001-18-003	Outfall 001 Condition at Discharge Location
NPDES-001-18-004	Outfall 001 Access and ISOCs Automatic Sampler
NPDES-001-18-005	Outfall 001 Receiving Stream Perennial Reach of Sandia Canyon, Segment Number 20.6.4.126 NMAC
NPDES-001-18-007	Power Plant - Induced Draft Fan with Bearings Cooled by Cooling Tower Water
NPDES-001-18-008	Power Plant - Cooling Towers
NPDES-001-18-009	Power Plant - Effluent Reuse Tank
NPDES-001-18-010	Power Plant - Manhole A
NPDES-001-18-011	Power Plant - Dechlorination Feed System at Manhole A
NPDES-001-18-012	Power Plant - Manhole B
NPDES-001-18-014	SERF - Treatment Building 1398
NPDES-001-18-015	SERF - Treatment Building 3093
NPDES-001-18-016	SERF – 1st Stage Reaction Tank Building 1398
NPDES-001-18-017	SERF – 2nd Stage Reaction Tank Building 1398
NPDES-001-18-018	SERF – Concentration Tank Building 1398
NPDES-001-18-019	SERF – Three (3) Microfilters in Building 3093
NPDES-001-18-020	SERF – Original Reverse Osmosis Unit in Building 1398
NPDES-001-18-021	SERF – Three (3) Reverse Osmosis Units in Building 3093
NPDES-001-18-022	SERF – pH Adjustment Tank
NPDES-001-18-023	SERF – Treated Water Storage
NPDES-001-18-024	SERF – Treated/Blended Water Effluent Tank
NPDES-001-18-025	SERF – Concentrate Thickener

LA-UR-19-22215 **Attachment C** C-1 of 14







Photograph - NPDES-001-18-001 Outfall 001 Location



Photograph - NPDES-001-18-002 Outfall 001 Condition from Above





Photograph – NPDES-001-18-003
Outfall 001 Condition at Discharge Location



Photograph – NPDES-001-18-004
Outfall 001 Access and ISOCs Automatic Sampler

C-5 of 14





Photograph - NPDES-001-18-005 Outfall 001 Receiving Stream Perennial Reach of Sandia Canyon, Segment Number 20.6.4.126 NMAC



Photograph - NPDES-001-18-007 **Power Plant - Induced Draft Fan with Bearings Cooled by Cooling Tower Water**

LA-UR-19-22215 **Attachment C** Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application





Photograph - NPDES-001-18-008 Power Plant - Cooling Towers



Photograph - NPDES-001-18-009 Power Plant - Effluent Reuse Tank





Photograph - NPDES-001-18-010 Power Plant - Manhole A



Photograph - NPDES-001-18-011
Power Plant - Dechlorination Feed System at Manhole A





Photograph - NPDES-001-18-012 Power Plant - Manhole B



Photograph - NPDES-001-18-014 SERF - Treatment Building 1398





Photograph - NPDES-001-18-015 SERF - Treatment Building 3093



Photograph - NPDES-001-18-016
SERF — 1st Stage Reaction Tank Building 1398





Photograph - NPDES-001-18-017 SERF - 2nd Stage Reaction Tank Building 1398



Photograph - NPDES-001-18-018
SERF - Concentration Tank Building 1398





Photograph - NPDES-001-18-019
SERF – Three (3) Microfilters in Building 3093



Photograph - NPDES-001-18-020 SERF - Original Reverse Osmosis Unit in Building 1398





Photograph - NPDES-001-18-021 SERF – Three (3) Reverse Osmosis Units in Building 3093



Photograph - NPDES-001-18-022 SERF - pH Adjustment Tank



Photograph - NPDES-001-18-023 SERF - Treated Water Storage



Photograph - NPDES-001-18-024
SERF - Treated/Blended Water Effluent Tank





Photograph - NPDES-001-18-025 SERF - Concentrate Thickener Tank



ATTACHMENT D: Discharge Monitoring Report (DMR) Summary October 2014 – September 2018

					Quantity o	r Loading		Quality or C	oncentratio	on						
					, , , , , ,									Number		
OUTFALL	TA -		Monitoring											of		
No.	Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency	Notes
001	TA3-22	2014	Oct	Flow (Totalized Est.)	0.121161	0.184000	MGD							31	Daily	Required by Permit
001	TA3-22	2014	Nov	Flow (Totalized Est.)	0.159133	0.326000	MGD							30	Daily	Required by Permit
001	TA3-22	2014	Dec	Flow (Totalized Est.)	0.176645	0.340000	MGD							31	Daily	Required by Permit
001	TA3-22	1	Jan	Flow (Totalized Est.)	0.179710	0.320000	MGD							31	Daily	Required by Permit
001	TA3-22	2015	Feb	Flow (Totalized Est.)	0.181404	0.245800	MGD							28	Daily	Required by Permit
001	TA3-22		Mar	Flow (Totalized Est.)	0.197826	0.341500	MGD							31	Daily	Required by Permit
001	TA3-22	2015	Apr	Flow (Totalized Est.)	0.153953	0.250600	MGD							30	Daily	Required by Permit
001	TA3-22	2015	•	Flow (Totalized Est.)	0.120032	0.246800	MGD							31	Daily	Required by Permit
001	TA3-22	2015	Jun	Flow (Totalized Est.)	0.141360	0.280400	MGD							30	Daily	Required by Permit
001	TA3-22	2015		Flow (Totalized Est.)	0.157226	0.231500	MGD							31	Daily	Required by Permit
001	TA3-22	2015	Aug	Flow (Totalized Est.)	0.169400	0.386100	MGD							31	Daily	Required by Permit
001	TA3-22	2015	Sept	Flow (Totalized Est.)	0.165970	0.210500	MGD							30	Daily	Required by Permit
001	TA3-22	2015	Oct	Flow (Totalized Est.)	0.239123	0.467700	MGD							31	Daily	Required by Permit
001	TA3-22	2015	Nov	Flow (Totalized Est.)	0.248140	0.307100	MGD							30	Daily	Required by Permit
001	TA3-22	2015	Dec	Flow (Totalized Est.)	0.283081	0.375100	MGD							31	Daily	Required by Permit
001	TA3-22	2016	Jan	Flow (Totalized Est.)	0.268674	0.344800	MGD							31	Daily	Required by Permit
001	TA3-22	2016	Feb	Flow (Totalized Est.)	0.287155	0.383800	MGD							29	Daily	Required by Permit
001	TA3-22	2016	Mar	Flow (Totalized Est.)	0.186881	0.289300	MGD							31	Daily	Required by Permit
001	TA3-22	2016	Apr	Flow (Totalized Est.)	0.148597	0.182900	MGD							30	Daily	Required by Permit
001	TA3-22	2016	May	Flow (Totalized Est.)	0.131665	0.174500	MGD							31	Daily	Required by Permit
001	TA3-22	2016	Jun	Flow (Totalized Est.)	0.074790	0.122200	MGD							30	Daily	Required by Permit
001	TA3-22	2016	Jul	Flow (Totalized Est.)	0.073061	0.122200	MGD							31	Daily	Required by Permit
001	TA3-22	2016	Aug	Flow (Totalized Est.)	0.169852	0.273000	MGD							31	Daily	Required by Permit
001	TA3-22	2016	Sept	Flow (Totalized Est.)	0.167600	0.276400	MGD							30	Daily	Required by Permit
001	TA3-22	2016	Oct	Flow (Totalized Est.)	0.166197	0.213300	MGD							31	Daily	Required by Permit
001	TA3-22	2016	Nov	Flow (Totalized Est.)	0.200943	0.257300	MGD							30	Daily	Required by Permit
001	TA3-22	2016	Dec	Flow (Totalized Est.)	0.224358	0.288500	MGD							31	Daily	Required by Permit
001	TA3-22	2017	Jan	Flow (Totalized Est.)	0.214345	0.288900	MGD							31	Daily	Required by Permit
001	TA3-22	2017	Feb	Flow (Totalized Est.)	0.195721	0.225700	MGD							28	Daily	Required by Permit
001	TA3-22	2017	Mar	Flow (Totalized Est.)	0.186019	0.246300	MGD							31	Daily	Required by Permit
001	TA3-22	2017	Apr	Flow (Totalized Est.)	0.188813	0.249300	MGD							30	Daily	Required by Permit
001	TA3-22	2017	May	Flow (Totalized Est.)	0.175574	0.280300	MGD							31	Daily	Required by Permit
001	TA3-22	2017	Jun	Flow (Totalized Est.)	0.150203	0.319000	MGD							30	Daily	Required by Permit
001	TA3-22	2017	Jul	Flow (Totalized Est.)	0.116726	0.185900	MGD							31	Daily	Required by Permit
001	TA3-22	2017	Aug	Flow (Totalized Est.)	0.129948	0.353700	MGD							31	Daily	Required by Permit
001	TA3-22		Sept	Flow (Totalized Est.)	0.136657	0.355900	MGD							30	Daily	Required by Permit
001	TA3-22		Oct	Flow (Totalized Est.)	0.184587	0.269000	MGD							31	Daily	Required by Permit
001	TA3-22	2017	Nov	Flow (Totalized Est.)	0.186037	0.229800	MGD							30	Daily	Required by Permit



					Quantity o	r Loading		Quality or C	oncentratio	on						
OUTFALL No.	TA - Bldg.	Year	Monitoring Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Number of Samples	Frequency	Notes
001	TA3-22	2017	Dec	Flow (Totalized Est.)	0.161406	0.258300	MGD							31	Daily	Required by Permit
001	TA3-22	2018	Jan	Flow (Totalized Est.)	0.113845	0.170400	MGD							31	Daily	Required by Permit
001	TA3-22	2018	Feb	Flow (Totalized Est.)	0.184782	0.275600	MGD							28	Daily	Required by Permit
001	TA3-22	2018	Mar	Flow (Totalized Est.)	0.176335	0.298100	MGD							31	Daily	Required by Permit
001	TA3-22	2018	Apr	Flow (Totalized Est.)	0.133397	0.197500	MGD							30	Daily	Required by Permit
001	TA3-22	2018	May	Flow (Totalized Est.)	0.217081	0.332600	MGD							31	Daily	Required by Permit
001	TA3-22	2018	Jun	Flow (Totalized Est.)	0.152293	0.239300	MGD							30	Daily	Required by Permit
001	TA3-22	2018	Jul	Flow (Totalized Est.)	0.099513	0.126500	MGD							31	Daily	Required by Permit
001	TA3-22	2018	Aug	Flow (Totalized Est.)	0.117100	0.217900	MGD							31	Daily	Required by Permit
001	TA3-22	2018	Sept	Flow (Totalized Est.)	0.123107	0.304300	MGD							30	Daily	Required by Permit
				Flow (Totalized Est.)	Ma	ximum 30 Day	y Average		0.2872					1461		
				Flow (Totalized Est.)		r	Maximum			0.4677				1461		
001	TA3-22	2014	Oct	рН				7.7	****	8.0	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2014	Nov	рН				7.6	****	7.9	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2014	Dec	рН				7.4	****	7.8	S.U.	6.6-8.8	S.U.	5.0	Weekly	Required by Permit
001	TA3-22	2015	Jan	рН				7.7	****	7.9	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2015	Feb	рН				7.6	****	7.8	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2015	Mar	pH				7.6	****	7.8	S.U.	6.6-8.8	S.U.	5.0	Weekly	Required by Permit
001	TA3-22	2015	Apr	pH				7.7	****	8.1	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2015	May	pH				7.7	****	8.0	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2015	Jun	pH				7.7	****	7.9	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2015	Jul	pH				7.6	****	7.9	S.U.	6.6-8.8	S.U.	5.0	Weekly	Required by Permit
001	TA3-22	2015	Aug	pH				7.7	****	7.8	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2015	Sept	pH				7.6	****	8.0	S.U.	6.6-8.8	S.U.	5.0	Weekly	Required by Permit
001	TA3-22	2015	Oct	pH				7.5	****	7.7	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2015		pH				7.4	****	7.7	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2015		pH				7.2	****	7.7	S.U.	6.6-8.8	S.U.	5.0	Weekly	Required by Permit
001	TA3-22	2016		рН				7.6	****	7.7	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2016		рН				7.5	****	7.7	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2016		рН				7.4	****	7.7	S.U.	6.6-8.8	S.U.	5.0	Weekly	Required by Permit
001	TA3-22	2016	-	рН				7.5	****	7.6	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2016	-	pH				7.6	****	7.7	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2016		pH				7.5	****	7.7	S.U.	6.6-8.8	S.U.	5.0	Weekly	Required by Permit
001	TA3-22	2016		pH				7.6	****	7.9	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2016	_	pH				7.6	****	7.8	S.U.	6.6-8.8	S.U.	5.0	Weekly	Required by Permit
001	TA3-22	2016	-	pH				7.7	****	8.0	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2016		pH				7.5	****	8.0	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2016		pH				7.6	****	7.8	S.U.	6.6-8.8	S.U.	5.0	Weekly	Required by Permit
001	TA3-22	2016		pH				7.5	****	7.9	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2017	Jan	рН				7.6	****	7.9	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit



					Quantity o	r Loading		Quality or C	oncentrati	on						
OUTFALL No.	Bldg.	Year	Monitoring Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Number of Samples	Frequency	Notes
001	TA3-22	2017	Feb	рН				7.5	****	7.7	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2017		рH				7.5	****	8.1	S.U.	6.6-8.8	S.U.	5.0	Weekly	Required by Permit
001	TA3-22	2017		pH				7.4	****	8.0	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2017	· ·	pH				7.6	****	7.9	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2017		pH				7.7	****	8.5	S.U.	6.6-8.8	S.U.	5.0	Weekly	Required by Permit
001	TA3-22	2017		рH				7.9	****	8.0	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2017	_	рH				7.6	****	7.8	S.U.	6.6-8.8	S.U.	5.0	Weekly	Required by Permit
001	TA3-22	2017	Sept	рH				7.6	****	7.9	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2017	Oct	рH				7.4	****	7.7	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2017	Nov	pH				7.3	****	7.8	S.U.	6.6-8.8	S.U.	5.0	Weekly	Required by Permit
001	TA3-22	2017	Dec	pH				7.2	****	7.8	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2018	Jan	pH				7.2	****	7.6	S.U.	6.6-8.8	S.U.	5.0	Weekly	Required by Permit
001	TA3-22	2018	Feb	pH				7.2	****	7.6	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2018	Mar	pH				7.0	****	7.6	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2018	Apr	рН				7.3	****	7.6	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2018	May	рН				7.6	****	7.9	S.U.	6.6-8.8	S.U.	5.0	Weekly	Required by Permit
001	TA3-22	2018	Jun	рН				7.5	****	7.7	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2018	Jul	рН				7.5	****	7.8	S.U.	6.6-8.8	S.U.	5.0	Weekly	Required by Permit
001	TA3-22	2018	Aug	рН				7.5	****	7.5	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
001	TA3-22	2018	Sept	рН				7.5	****	7.8	S.U.	6.6-8.8	S.U.	4.0	Weekly	Required by Permit
				рН		l	Minimum	7.0			S.U.		S.U.	208		
				рН	Ma	ximum 30 Day			7.94		S.U.		S.U.	208		
	1		T	рН		<u> </u>	/laximum			8.5	S.U.		S.U.	208		
001	TA3-22	2014		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2014		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2014	Dec	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
001	TA3-22	2015	Jan	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2015	Feb	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2015		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
001	TA3-22	2015	Apr	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2015	May	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2015	Jun	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2015	Jul	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
001	TA3-22	2015	Aug	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2015	Sept	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
001	TA3-22	2015	Oct	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2015	Nov	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2015	Dec	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
001	TA3-22	2016	Jan	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2016	Feb	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit



					Quantity o	r Loading		Quality or C	oncentration	on						
OUTFALL No.	Bldg.	Year	Monitoring Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Number of Samples	Frequency	Notes
001	TA3-22	2016	Mar	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
001	TA3-22	2016	•	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2016	•	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2016		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
001	TA3-22	2016		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2016		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
001	TA3-22	2016	Sept	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22		Oct	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2016		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
001	TA3-22	2016	Dec	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2017	Jan	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2017	Feb	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2017	Mar	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
001	TA3-22	2017	Apr	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2017	May	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2017	Jun	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
001	TA3-22	2017	Jul	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2017	Aug	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
001	TA3-22	2017	Sept	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2017	Oct	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2017	Nov	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
001	TA3-22	2017	Dec	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2018	Jan	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
001	TA3-22	2018	Feb	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2018	Mar	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2018	Apr	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2018	May	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
001	TA3-22	2018	Jun	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2018	Jul	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
001	TA3-22	2018	Aug	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
001	TA3-22	2018	Sept	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
				Total Residual Chlorine	Ma	ximum 30 Day	/ Average		0		mg/L		mg/L	208		
				Total Residual Chlorine		N	Naximum			0	mg/L		mg/L	208		
001	TA3-22	2014	Oct	Temperature				****	****	****	deg C	24 Monthly Ave & Daily Max	deg C	0	NA	Required by Permit
001	TA3-22	2014	Nov	Temperature				****	****	****	deg C	24 Monthly Ave & Daily Max	deg C	0	NA	Required by Permit
001	TA3-22	2014	Dec	Temperature				****	****	****	deg C	24 Monthly Ave & Daily Max	deg C	0	NA	Required by Permit
001	TA3-22	2015	Jan	Temperature				****	****	****	deg C	24 Monthly Ave & Daily Max	deg C	0	NA	Required by Permit
001	TA3-22	2015	Feb	Temperature				****	****	****	deg C	24 Monthly Ave & Daily Max	deg C	0	NA	Required by Permit
001	TA3-22	2015	Mar	Temperature				****	****	****	deg C	24 Monthly Ave & Daily Max	deg C	0	NA	Required by Permit
001	TA3-22	2015	Apr	Temperature				****	****	****	deg C	24 Monthly Ave & Daily Max	deg C	4	Weekly	Required by Permit



Fig. 2						Quantity o	r Loading		Quality or C	oncentration	on						
17.4 22 2015 Jul Temperature 2015 2015 Jul Temperature 2015 21.5 22.7 dog C 2.4 Monthly-live B Dully Mass dig C 4 Weekly Required by Iven 2015 21.5 22.7 dog C 2.4 Monthly-live B Dully Mass dig C 4 Weekly Required by Iven 2015 21.5 22.7 dog C 2.4 Monthly-live B Dully Mass dig C 4 Weekly Required by Iven 2015 21.5 22	No.	Bldg.		Period	Parameter	Average	Maximum	Units							of	-	
No. 1.2 2.0 1.3 1.5	001	ł	1	-	Temperature						20.1	deg C	24 Monthly Ave & Daily Max	deg C	4	Weekly	Required by Permit
100 1743-27 2015 Sug. Temperature **** 2016 21.5 Sug. C. 24 Monthly, Area B. Daily Max deg. C. 24 Weely Required by Period 1743-22 2015 Sug. C. C. C. C. C. C. C.	001	ł	1		Temperature					22.0	23.0	deg C	24 Monthly Ave & Daily Max	deg C	4	Weekly	Required by Permit
001 17.3-22 20.15 Sept Temperature	001	ł	+		Temperature						22.7	deg C	24 Monthly Ave & Daily Max	deg C	5	Weekly	Required by Permit
OOI TA3-22 2015 OOT Temperature			1		Temperature						 	deg C	,	deg C	4	Weekly	Required by Permit
1.73 1.75	001			-	Temperature					19.9		deg C	24 Monthly Ave & Daily Max	deg C	5	Weekly	Required by Permit
1.7.5 1.7.	001		2015	Oct	Temperature					19.0		deg C	24 Monthly Ave & Daily Max	deg C	4	Weekly	Required by Permit
Onl TA3-22 2016 On Temperature	001		1		Temperature							deg C	24 Monthly Ave & Daily Max	deg C	4	Weekly	Required by Permit
1.00 17.43-22 2016 Feb Temperature	001	TA3-22	2015	Dec	Temperature				****	12.1	14.0	deg C	24 Monthly Ave & Daily Max	deg C	5	Weekly	Required by Permit
1.00 17.43-22 2016 Mar Temperature	001	TA3-22	2016	Jan	Temperature				****	10.9	11.1	deg C	24 Monthly Ave & Daily Max	deg C	4	Weekly	Required by Permit
DOI	001	TA3-22	2016	Feb	Temperature				****	12.0	13.8	deg C	24 Monthly Ave & Daily Max	deg C	4	Weekly	Required by Permit
001 TA3-22 2016 May Temperature	001	TA3-22	2016	Mar	Temperature				****	14.2	16.1	deg C	24 Monthly Ave & Daily Max	deg C	5	Weekly	Required by Permit
001 Ta3-22 2016 un	001	TA3-22	2016	Apr	Temperature				****	15.7	16.6	deg C	24 Monthly Ave & Daily Max	deg C	4	Weekly	Required by Permit
001 TA3-22 2016 Aug Temperature	001	TA3-22	2016	May	Temperature				****	17.5	19.1	deg C	24 Monthly Ave & Daily Max	deg C	4	Weekly	Required by Permit
1.00 17.3-22 20.16 Aug Temperature	001	TA3-22	2016	Jun	Temperature				****	20.6	22.4	deg C	24 Monthly Ave & Daily Max	deg C	5	Weekly	Required by Permit
DOI TA3-22 2016 Sept Temperature	001	TA3-22	2016	Jul	Temperature				***	22.6	24.1	deg C	24 Monthly Ave & Daily Max	deg C	4	Weekly	Required by Permit
19.3 19.7 19.8 19.7 19.8 19.7 19.8 19.7 19.8 19.7 19.8 19.7 19.8 19.7 19.8 19.7 19.8 19.7 19.8 19.7 19.8 19.7 19.8	001	TA3-22	2016	Aug	Temperature				****	21.6	23.8	deg C	24 Monthly Ave & Daily Max	deg C	5	Weekly	Required by Permit
1.5 1.5	001	TA3-22	2016	Sept	Temperature				****	18.9	20.1	deg C	24 Monthly Ave & Daily Max	deg C	4	Weekly	Required by Permit
1.001 TA3-22 2016 Dec Temperature	001	TA3-22	2016	Oct	Temperature				****	19.3	19.7	deg C	24 Monthly Ave & Daily Max	deg C	4	Weekly	Required by Permit
1.4 12.3 deg C 24 Monthly Ave & Daily Max deg C 4 Weekly Required by Perr	001	TA3-22	2016	Nov	Temperature				****	16.4	18.3	deg C	24 Monthly Ave & Daily Max	deg C	5	Weekly	Required by Permit
12.3 13.0 deg C 24 Monthly Ave & Daily Max deg C 4 Weekly Required by Perr	001	TA3-22	2016	Dec	Temperature				****	12.5	13.0	deg C	24 Monthly Ave & Daily Max	deg C	4	Weekly	Required by Permit
1.5 16.9	001	TA3-22	2017	Jan	Temperature				****	11.4	12.3	deg C	24 Monthly Ave & Daily Max	deg C	4	Weekly	Required by Permit
15.9	001	TA3-22	2017	Feb	Temperature				****	12.3	13.0	deg C	24 Monthly Ave & Daily Max	deg C	4	Weekly	Required by Permit
TA3-22 2017 May Temperature	001	TA3-22	2017	Mar	Temperature				****	13.6	16.9	deg C	24 Monthly Ave & Daily Max	deg C	5	Weekly	Required by Permit
19.1 19.1	001	TA3-22	2017	Apr	Temperature				****	15.9	16.6	deg C	24 Monthly Ave & Daily Max	deg C	4	Weekly	Required by Permit
1	001	TA3-22	2017	May	Temperature				****	15.8	17.5	deg C	24 Monthly Ave & Daily Max	deg C	4	Weekly	Required by Permit
21.1 22.1 3.2 2.2 3.2 3.2 3.3 3.3 3.2 2.2 3.3 3.	001	TA3-22	2017	Jun	Temperature				****	19.1	20.0	deg C	24 Monthly Ave & Daily Max	deg C	5	Weekly	Required by Permit
001 TA3-22 2017 Sept Temperature ***** 20.0 20.5 deg C 24 Monthly Ave & Daily Max deg C 4 Weekly Required by Perr Onling 001 TA3-22 2017 Oct Temperature ***** 17.9 18.7 deg C 24 Monthly Ave & Daily Max deg C 4 Weekly Required by Perr Onling 001 TA3-22 2017 Dec Temperature ***** 16.4 17.7 deg C 24 Monthly Ave & Daily Max deg C 5 Weekly Required by Perr Onling 001 TA3-22 2017 Dec Temperature ***** 14.1 15.6 deg C 24 Monthly Ave & Daily Max deg C 4 Weekly Required by Perr Onling 001 TA3-22 2018 Feb Temperature ***** 12.9 14.1 deg C 24 Monthly Ave & Daily Max deg C 4 Weekly Required by Perr Onling 001 TA3-22 2018 Mar Temperature ***** <	001	TA3-22	2017	Jul	Temperature				****	21.1	22.1	deg C	24 Monthly Ave & Daily Max	deg C	4	Weekly	Required by Permit
001 TA3-22 2017 Oct Temperature ***** 17.9 18.7 deg C 24 Monthly Ave & Daily Max deg C 4 Weekly Required by Perr Perr Perr Perr Perr Perr Perr Per	001	TA3-22	2017	Aug	Temperature				****	20.8	21.3	deg C	24 Monthly Ave & Daily Max	deg C	5	Weekly	Required by Permit
001 TA3-22 2017 Nov Temperature **** 16.4 17.7 deg C 24 Monthly Ave & Daily Max deg C 5 Weekly Required by Perr Require	001	TA3-22	2017	Sept	Temperature				****	20.0	20.5	deg C	24 Monthly Ave & Daily Max	deg C	4	Weekly	Required by Permit
10.1	001	TA3-22	2017	Oct	Temperature				****	17.9	18.7	deg C	24 Monthly Ave & Daily Max	deg C	4	Weekly	Required by Permit
14.1 13.0 14.2 2018 Jan Temperature 14.1 13.0 15.2 24 Monthly Ave & Daily Max deg C 4 Weekly Required by Perr 14.1 15.0 15.0 15	001	TA3-22	2017	Nov	Temperature				****	16.4	17.7	deg C	24 Monthly Ave & Daily Max	deg C	5	Weekly	Required by Permit
001 TA3-22 2018 Jan Temperature **** 13.3 15.2 deg C 24 Monthly Ave & Daily Max deg C 5 Weekly Required by Perr Require	001	TA3-22	2017	Dec	Temperature				****	14.1	15.6	deg C	24 Monthly Ave & Daily Max	deg C	4	Weekly	Required by Permit
001 TA3-22 2018 Feb Temperature ***** 12.9 14.1 deg C 24 Monthly Ave & Daily Max deg C 4 Weekly Required by Perr Requir	001	TA3-22	2018	Jan	Temperature				****	13.3	15.2	deg C	24 Monthly Ave & Daily Max		5	Weekly	Required by Permit
001 TA3-22 2018 Mar Temperature **** 13.5 13.8 deg C 24 Monthly Ave & Daily Max deg C 4 Weekly Required by Perr Require		TA3-22	1		•				****	12.9	14.1	_	,		4	•	Required by Permit
001 TA3-22 2018 Apr Temperature **** 15.3 16.0 deg C 24 Monthly Ave & Daily Max deg C 4 Weekly Required by Perr 001 TA3-22 2018 May Temperature **** 17.6 18.8 deg C 24 Monthly Ave & Daily Max deg C 5 Weekly Required by Perr 001 TA3-22 2018 Jun Temperature ***** 19.2 19.8 deg C 24 Monthly Ave & Daily Max deg C 4 Weekly Required by Perr		TA3-22	2018	Mar	•				****	13.5	13.8	_	,		4	Weekly	Required by Permit
001 TA3-22 2018 May Temperature **** 17.6 18.8 deg C 24 Monthly Ave & Daily Max deg C 5 Weekly Required by Perr 001 TA3-22 2018 Jun Temperature **** 19.2 19.8 deg C 24 Monthly Ave & Daily Max deg C 4 Weekly Required by Perr		1			•				****			_	, ,	_	4	•	Required by Permit
001 TA3-22 2018 Jun Temperature **** 19.2 19.8 deg C 24 Monthly Ave & Daily Max deg C 4 Weekly Required by Perr		1		-	•				****			_	•		5	•	Required by Permit
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					Quantity o	r Loading		Quality or C	oncentration	on						
														Number		
OUTFALL	TA -		Monitoring											of		
No.	Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency	Notes
001	TA3-22	2018	Sept	Temperature				****	19.0	20.5	deg C	24 Monthly Ave & Daily Max	deg C	4	Weekly	Required by Permit
				Temperature	Ma	ximum 30 Day			22.625					182		
	T	1	_	Temperature			/laximum	to the the		24.1				182	T	
001	TA3-22		Oct	E.Coli				****	<8.47	71.7	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2014	Nov	E.Coli				****	<1	1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22		Dec	E.Coli				****	<1	<1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2015		E.Coli				****	<1	<1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2015		E.Coli				****	<1	1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22		Mar	E.Coli				****	<1	<1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	1	Apr	E.Coli				****	1	1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2015	-	E.Coli				****	<1	<1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2015		E.Coli				****	<1	<1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2015		E.Coli				****	<1.761	3.1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22		Aug	E.Coli				****	4.1	8.5	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22		Sept	E.Coli				****	3.6	4.1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	1	Oct	E.Coli				****	<3.1	9.8	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22		Nov	E.Coli				****	<1	<1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2015	Dec	E.Coli				****	<1	1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22		Jan	E.Coli				****	<1	<1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22		Feb	E.Coli				****	<1	<1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22		Mar	E.Coli				****	<1	1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	1	Apr	E.Coli				****	<1	1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2016	May	E.Coli				****	1	1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22		Jun	E.Coli				****	<1.732	3	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2016	Jul	E.Coli				****	1.732	3	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2016	Aug	E.Coli				****	<1	2	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2016	Sept	E.Coli				****	<2.7	7.3	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2016	Oct	E.Coli				****	1.4	2	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2016	Nov	E.Coli				****	2.3	5.2	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2016	Dec	E.Coli				****	<1	<1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2017	Jan	E.Coli				***	<1	<1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2017	Feb	E.Coli				****	<1	<1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2017	Mar	E.Coli				****	<1.414	2	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2017	Apr	E.Coli				****	<1	1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2017	May	E.Coli				****	<1	<1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2017	Jun	E.Coli				****	<1.761	3.1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2017	Jul	E.Coli				****	6.3	9.7	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2017	Aug	E.Coli				****	2.5	3.1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2017	Sept	E.Coli				****	2.25	5.1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2017	Oct	E.Coli				****	<1	1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit



					Quantity o	r Loading		Quality or 0	Concentrati	on						
OUTFALL No.	TA - Bldg.	Year	Monitoring Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Number of Samples	Frequency	Notes
001	TA3-22	2017	Nov	E.Coli				****	2	2	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2017	Dec	E.Coli				****	3.6	4.1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2018	Jan	E.Coli				****	<1	1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2018	Feb	E.Coli				****	<1	<1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2018	Mar	E.Coli				****	<1	<1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2018	Apr	E.Coli				****	<1	1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2018	May	E.Coli				****	<1	1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2018	Jun	E.Coli				****	10.5	21.1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2018	Jul	E.Coli				****	15.3	21.3	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2018	Aug	E.Coli				****	5	9.7	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
001	TA3-22	2018	Sept	E.Coli				****	15.4	33.1	cfu/100ml	126 Monthly Ave 410 Daily Max	cfu/100mL	2	Monthly	Required by Permit
				E.Coli		Daily	y Average		6.9		cfu/100ml		cfu/100mL	96		
				E.Coli	Ma	ximum 30 Day	y Average		15.4		cfu/100ml		cfu/100mL	96		
				E.Coli		ſ	Maximum			71.7	cfu/100ml		cfu/100mL	96		
001	TA3-22	2014	Oct	Total Suspended Solids	0.77	0.77	lbs/day	****	1.2	1.2	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2014	Nov	Total Suspended Solids	0.73	0.73	lbs/day	****	1.5	1.5	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2014	Dec	Total Suspended Solids	2.42	2.42	lbs/day	****	5	5	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2015	Jan	Total Suspended Solids	7.03	7.03	lbs/day	****	4.53	4.53	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2015	Feb	Total Suspended Solids	3.28	3.28	lbs/day	****	2.2	2.2	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2015	Mar	Total Suspended Solids	0.72	0.72	lbs/day	****	0.6	0.6	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2015	Apr	Total Suspended Solids	3.94	3.94	lbs/day	****	2.5	2.5	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2015	May	Total Suspended Solids	0.53	0.53	lbs/day	****	1.3	1.3	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2015	Jun	Total Suspended Solids	1.15	1.15	lbs/day	****	0.9	0.9	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2015	Jul	Total Suspended Solids	1.72	1.72	lbs/day	****	1.3	1.3	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2015	Aug	Total Suspended Solids	2	2	lbs/day	****	1.3	1.3	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2015	Sept	Total Suspended Solids	3.48	3.48	lbs/day	****	3.1	3.1	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2015	Oct	Total Suspended Solids	3.99	3.99	lbs/day	****	2.5	2.5	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2015	Nov	Total Suspended Solids	1.87	1.87	lbs/day	****	0.8	0.8	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2015	Dec	Total Suspended Solids	1.83	1.83	lbs/day	****	0.7	0.7	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2016	Jan	Total Suspended Solids	<2.17	<2.17	lbs/day	****	<1.14	<1.14	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2016	Feb	Total Suspended Solids	3.38	3.38	lbs/day	****	1.4	1.4	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2016	Mar	Total Suspended Solids	8.22	8.22	lbs/day	****	5.6	5.6	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2016	Apr	Total Suspended Solids	<1.55	<1.55	lbs/day	****	<1.14	<1.14	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2016	May	Total Suspended Solids	1	1	lbs/day	****	1.1	1.1	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2016	Jun	Total Suspended Solids	1.37	1.37	lbs/day	****	7.2	7.2	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2016	Jul	Total Suspended Solids	<0.41	<0.41	lbs/day	****	<1.14	<1.14	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2016	Aug	Total Suspended Solids	<1.26	<1.26	lbs/day	****	<0.570	<0.570	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2016	Sept	Total Suspended Solids	<8.92	<8.92	lbs/day	****	<5.7	<5.7	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2016	Oct	Total Suspended Solids	2.8	2.8	lbs/day	****	1.8	1.8	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2016	Nov	Total Suspended Solids	0.988	0.988	lbs/day	****	0.6	0.6	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit



					Quantity o	r Loading		Quality or C	oncentration	on						
OUTFALL No.	TA - Bldg.	Year	Monitoring Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Number of Samples	Frequency	Notes
001	TA3-22	2016	Dec	Total Suspended Solids	2.59	2.59	lbs/day	****	1.26	1.26	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2017	Jan	Total Suspended Solids	4.185	4.185	lbs/day	****	2	2	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2017	Feb	Total Suspended Solids	3.66	3.66	lbs/day	****	2	2	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2017	Mar	Total Suspended Solids	4.698	4.698	lbs/day	****	2.4	2.4	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2017	Apr	Total Suspended Solids	6.613	6.613	lbs/day	****	5.9	5.9	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2017	May	Total Suspended Solids	1.4	1.4	lbs/day	****	0.9	0.9	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2017	Jun	Total Suspended Solids	1.47	1.47	lbs/day	****	1.2	1.2	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2017	Jul	Total Suspended Solids	0.146	0.146	lbs/day	****	1.5	1.5	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2017	Aug	Total Suspended Solids	2.85	2.85	lbs/day	****	1.7	1.7	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2017	Sept	Total Suspended Solids	0.898	0.898	lbs/day	****	1.2	1.2	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2017	Oct	Total Suspended Solids	1.169	1.169	lbs/day	****	0.753	0.753	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2017	Nov	Total Suspended Solids	2.03	2.03	lbs/day	****	1.4	1.4	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2017	Dec	Total Suspended Solids	1.087	1.087	lbs/day	****	0.7	0.7	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2018		Total Suspended Solids	0.756	0.756	lbs/day	****	0.8	0.8	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2018		Total Suspended Solids	2.29	2.29	lbs/day	****	1.5	1.5	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2018	Mar	Total Suspended Solids	<0.708	<0.708	lbs/day	****	<0.57	<0.57	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2018		Total Suspended Solids	<0.632	<0.632	lbs/day	****	<0.57	<0.57	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2018	•	Total Suspended Solids	<0.632	<0.632	lbs/day	****	<0.57	<0.57	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2018	•	Total Suspended Solids	2.3	2.3	lbs/day	****	1.3	1.3	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2018		Total Suspended Solids	2.05	2.05	lbs/day	****	2.42	2.42	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
001	TA3-22	2018		Total Suspended Solids	0.801	1.05	lbs/day	****	1	1.2	mg/L	30 Monthly Ave 100 Daily Max	mg/L	2	Monthly	Required by Permit
001	TA3-22	2018		Total Suspended Solids	8.63	8.63	lbs/day	****	3.4	3.4	mg/L	30 Monthly Ave 100 Daily Max	mg/L	1	Monthly	Required by Permit
				Total Suspended Solids			y Average		1.99		mg/L	, , , , , , , , , , , , , , , , , , , ,	mg/L	49		Troquir ou sy to similar
				Total Suspended Solids	Ma	ximum 30 Da			7.2		mg/L		mg/L	49		
				Total Suspended Solids			, <u> </u>			7.2	mg/L		mg/L	49		
001	TA3-22	2015	Sept	Aluminum, Total				****	****	<0.015	mg/L	0.9889	mg/L	1	Yearly	Required by Permit
001	TA3-22	2016		Aluminum, Total				****	****	0.02440	mg/L	0.9889	mg/L	1	Yearly	Required by Permit
001	TA3-22	2017		Aluminum, Total				****	****	<0.0193	mg/L	0.9889	mg/L	3	Yearly	Required by Permit
001	TA3-22	2018		Aluminum, Total				****	****	<0.0193	mg/L	0.9889	mg/L	4	Yearly	Required by Permit
			1 3 3 4 1	Aluminum		Dail	y Average		0.0244		mg/L		<u> </u>		,	
				Aluminum	Ma	ximum 30 Da			0.02440		mg/L					
				Aluminum			,			0.0244	mg/L			9		
001	TA3-22	2015	Sept	Copper, Dissolved				****	****	0.00120	mg/L	0.0073	mg/L	1	Yearly	Required by Permit
001	TA3-22	2016		Copper, Dissolved				****	****	0.00174	mg/L	0.0073	mg/L	1	Yearly	Required by Permit
001	TA3-22	2017		Copper, Dissolved				****	****	0.00579	mg/L	0.0073	mg/L	6	Yearly	Required by Permit
001	TA3-22	2018	•	Copper, Dissolved				****	****	0.00622	mg/L	0.0073	mg/L	2	Yearly	Required by Permit
	Copper					Dail	y Average			-	mg/L		<u> </u>		,	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	Copper					ximum 30 Da					mg/L					
	Сорре						Maximum			0.00622	mg/L			10		
001	TA3-22	2015	Sept	PCB ^a				****	0.00257	0.00257	ug/L	0.00064 Monthly Ave & Daily Max	ug/L	1	Yearly	Required by Permit



Quantity or Loading							Quality or Concentration									
OUTFALL No.	TA - Bldg.	Year	Monitoring Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Number of Samples	Frequency	Notes
001	TA3-22	2016	Sept	PCB ^a				****	0.00158	0.0019	ug/L	0.00064 Monthly Ave & Daily Max	ug/L	2	Yearly	Required by Permit
001	TA3-22	2017	Sept	PCB ^a				****	0	0	ug/L	0.00064 Monthly Ave & Daily Max	ug/L	1	Yearly	Required by Permit
001	TA3-22	2018	Sept	PCB ^a				****	0.009	0.013	ug/L	0.00064 Monthly Ave & Daily Max	ug/L	2	Yearly	Required by Permit
a.	Results were	obtained ι	ısing the EPA pu	ublished Congener Method 1668	Revision and	detection limits	. The metho	od and detection	n limits allow	for lower conc	entrations to b	e detected than the Aroclor method require	ed for the anal	ytical results p	provided in the	Form 2C.
PCB						Daily	/ Average		0.0033		mg/L					
PCB Maximum 30 Day					/ Average			0.0044	mg/L							
РСВ						ſ	Naximum			0.0130	mg/L			6		
1	TA3-22	2016	Sept	Gross Alpha				***	1.36	1.36	pCi/L	NA	pCi/L	1	Term	Required by Permit
Gross Alpha Daily Average								pCi/L								
Gross Alpha Maximum 30 Day Average								pCi/L								
Gross Alpha Max					Maximum			1.36	pCi/L			1				



2019 NPDES Permit Reapplication - WET Test Summary Report Outfall 001

Year	Sample Dates	Fathead Minno			Ceriodaphnia du	ıbia						
		Survival		Growth		Survival		Reproduction		Frequency	Driver	
2015	May 23, 25, 27	NOEC 100%	Pass	NOEC 100%	Pass	NOEC 100%	Pass	NOEC 75%	Fail	Term	Required by Permit	
2015	Apr 20, 22, 24	NR		NR		NOEC 100%	Pass	NOEC 100%	Pass	Retest 1 of 3	Required by Permit	
2015	Jun 8, 10, 12	NR		NR		NOEC 100%	Pass	NOEC 100%	Pass	Retest 2 of 3	Required by Permit	
2015	Jun 15, 17, 19	NR		NR		NOEC 100%	Pass	NOEC 32%	Fail	Retest 3 of 3	Required by Permit	
2015	Aug 17, 19, 21	NR		NR		NOEC 100%	Pass	NOEC 100%	Pass	Retest 1 of 3	Required by Permit	
2015	Sep 14, 16, 18	NR		NR		NOEC 100%	Pass	NOEC 100%	Pass	Retest 2 of 3	Required by Permit	
2015	Oct 19, 21, 23	NR		NR		NOEC 100%	Pass	NOEC 75%	Fail	Retest 3 of 3	Required by Permit	
2015	Nov 16, 18, 20	NR		NR		NOEC 100%	Pass	NOEC 75%	Fail	Retest 1 of 3	Required by Permit	
2015	Dec 14, 16, 18	NR		NR		NOEC 100%	Pass	NOEC 75%	Fail	Retest 1 of 3	Required by Permit	
2016	Jan 25, 27, 29	NR		NR		NOEC 100%	Pass	NOEC 100%	Pass	Retest 2 of 3	Required by Permit	
2016	Feb 22, 24, 26	NR		NR		NOEC 100%	Pass	NOEC 32%	Fail	Retest 3 of 3	Required by Permit	
2016	Mar 28, 30, Apr 1	NR		NR		NOEC 100%	Pass	NOEC 75%	Fail	Retest 1 of 3	Required by Permit	
2016	Apr 25, 27, 29	NR		NR		NOEC 100%	Pass	NOEC 100%	Pass	Retest 1 of 3	Required by Permit	
2016	May 16, 18, 20	NR		NR		NOEC 100%	Pass	NOEC 100%	Pass	Retest 2 of 3	Required by Permit	
2016	June 27, 29, Jul 1	NR		NR		NOEC 100%	Pass	NOEC 100%	Pass	Retest 3 of 3	Required by Permit	
2016	Aug 8, 10, 12	NR		NR		NOEC 100%	Pass	NOEC 100%	Pass	Quarterly	Required by Permit	
2016	Dec 9, 12, 14	NR		NR		NOEC 100%	Pass	NOEC 100%	Pass	Quarterly	Required by Permit	
2017	Feb 13, 15, 17	NR		NR		NOEC 100%	Pass	NOEC 100%	Pass	Quarterly	Required by Permit	
2017	May 1, 3, 5	NR		NR		NOEC 100%	Pass	NOEC 100%	Pass	Quarterly	Required by Permit	
2017	Aug 28, 30, Sep 1	NR		NR		NOEC 100%	Pass	NOEC 100%	Pass	Quarterly	Required by Permit	
2017	Nov 1, 3, 6	NR		NR		NOEC 100%	Pass	NOEC 100%	Pass	Quarterly	Required by Permit	
2018	Feb 12, 14, 16	NR		NR		NOEC 100%	Pass	NOEC 100%	Pass	Quarterly	Required by Permit	
2018	June 4, 6, 8	NR		NR		NOEC 100%	Pass	NOEC 75%	Fail	Quarterly	Required by Permit	
2018	July 30, 1, 3	NR		NR		NOEC 100%	Pass	NOEC 100%	Pass	Retest 1 of 3	Required by Permit	
2018	Aug 27, 29, 31	NR		NR		NOEC 100%	Pass	NOEC 100%	Pass	Retest 2 of 3	Required by Permit	
2018	Sept 10, 12, 14	NR		NR		NOEC 100%	Pass	NOEC 100%	Pass	Retest 3 of 3	Required by Permit	
2018	Oct 22, 24, 26	NR		NR		NOEC 100%	Pass	NOEC 100%	Pass	Quarterly	Required by Permit	

No Observed Lethal Effect Concentration - Defined as the greatest effluent dilution at and below which toxicity that is statistically different from the control at NOEC the 95% confidence level does not occur





ATTACHMENT E: Safety Data Sheets

LIST OF SAFETY DATA SHEETS
Nalco 7408
25% Magnesium Chloride
25% Sodium Hydroxide
33% Hydrochloric Acid
35% Sodium Hypochlorite
38% Sodium Bisulfite
40% Ferric Chloride
Nalco PermaTreat PC-510T RO Scale Inhibitor
Bright Dyes FLT Yellow/Green Liquid
Bright Dyes FLT Yellow/Green Tablet





NALCO 7408





SAFETY DATA SHEET

NALCO® 7408

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : NALCO® 7408

Other means of identification : Not applicable.

Recommended use : CHLORINE SCAVENGER

Restrictions on use : Refer to available product literature or ask your local Sales Representative for

restrictions on use and dose limits.

Company : Nalco Company

1601 W. Diehl Road

Naperville, Illinois 60563-1198

USA

TEL: (630)305-1000

Emergency telephone

number

(800) 424-9300 (24 Hours) CHEMTREC

Issuing date : 03/09/2017

Section: 2. HAZARDS IDENTIFICATION

GHS Classification

Acute toxicity (Oral) : Category 4

GHS Label element

Hazard pictograms :



Signal Word : Warning

Hazard Statements : Harmful if swallowed.

Precautionary Statements : Prevention:

Wash skin thoroughly after handling. Do not eat, drink or smoke when using this

product. Response:

IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel

unwell. Rinse mouth.

Storage:

Protect product from freezing.

Disposal:

Dispose of contents/ container to an approved waste disposal plant.

Other hazards : None known.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance/mixture : Mixture

1/11



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Chemical Name CAS-No. Concentration: (%)

Sodium Bisulfite 7631-90-5 30 - 60

Section: 4. FIRST AID MEASURES

In case of eye contact : Rinse with plenty of water. Get medical attention if symptoms occur.

In case of skin contact : Wash off with soap and plenty of water. Get medical attention if symptoms

occur.

If swallowed : Rinse mouth. Get medical attention if symptoms occur.

If inhaled : Get medical attention if symptoms occur.

Protection of first-aiders : In event of emergency assess the danger before taking action. Do not put

yourself at risk of injury. If in doubt, contact emergency responders. Use

personal protective equipment as required.

Notes to physician : Treat symptomatically.

Most important symptoms and effects, both acute and

delayed

See Section 11 for more detailed information on health effects and symptoms.

Section: 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the

surrounding environment.

Unsuitable extinguishing

media

None known.

Specific hazards during

firefighting

Not flammable or combustible.

Hazardous combustion

products

Decomposition products may include the following materials: Carbon oxides

nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus

Special protective equipment :

for firefighters

Use personal protective equipment.

Specific extinguishing

methods

Fire residues and contaminated fire extinguishing water must be disposed of in

accordance with local regulations. In the event of fire and/or explosion do not

breathe fumes.

Section: 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Ensure clean-up is conducted by trained personnel only. Refer to protective

measures listed in sections 7 and 8.

Environmental precautions : Do not allow contact with soil, surface or ground water.



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Methods and materials for containment and cleaning up

Stop leak if safe to do so. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Flush away traces with water.

Section: 7. HANDLING AND STORAGE

Advice on safe handling : Do not ingest. Wash hands thoroughly after handling. Use only with adequate

ventilation.

Conditions for safe storage : Keep out of reach of children. Keep container tightly closed. Store in suitable

labelled containers.

Suitable material : Keep in properly labelled containers.

Unsuitable material : not determined

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	in personal residence as as	Permissible concentration	Basis
Sodium Bisulfite	7631-90-5	TWA	5 mg/m3	ACGIH
		TWA	5 mg/m3	NIOSH REL

Engineering measures : Effective exhaust ventilation system. Maintain air concentrations below

occupational exposure standards.

Personal protective equipment

Eye protection : Safety glasses

Hand protection : Wear protective gloves.

Gloves should be discarded and replaced if there is any indication of

degradation or chemical breakthrough.

Wear protective gloves.

Gloves should be discarded and replaced if there is any indication of

degradation or chemical breakthrough.

Skin protection : Wear suitable protective clothing.

Respiratory protection : When workers are facing concentrations above the exposure limit they must use

appropriate certified respirators.

No personal respiratory protective equipment normally required.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. Remove

and wash contaminated clothing before re-use. Wash face, hands and any

exposed skin thoroughly after handling.



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Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance Liquid Colour clear Odour Pungent Flash point does not flash рН no data available Odour Threshold no data available

Melting point/freezing point FREEZING POINT: 1.1 °C

Initial boiling point and boiling :

range

104 °C

Evaporation rate no data available Flammability (solid, gas) no data available Upper explosion limit no data available Lower explosion limit no data available

Vapour pressure 32 mm Hg, (25 °C), ASTM D 323,

Relative vapour density 2.2(Air = 1)

Relative density 1.37, (25 °C), ASTM D-1298

11.4 lb/gal Density

Water solubility completely soluble Solubility in other solvents no data available Partition coefficient: nno data available

octanol/water

Auto-ignition temperature no data available Thermal decomposition no data available

temperature

2.8 mPa.s (25 °C) Viscosity, dynamic no data available Viscosity, kinematic

Molecular weight no data available

VOC 0 %, 0 g/l, EPA Method 24

Section: 10. STABILITY AND REACTIVITY

Chemical stability Stable under normal conditions.

Possibility of hazardous

reactions

No dangerous reaction known under conditions of normal use.

Conditions to avoid None known.

Incompatible materials Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid,



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perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors.

Contact with strong acids (e.g. sulfuric, phosphoric, nitric, hydrochloric, chromic, sulfonic) may generate heat, splattering or boiling and toxic vapors. SO2 may react with vapors from neutralizing amines and may produce a visible cloud of amine salt particles.

Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors.

Contact with strong acids (e.g. sulfuric, phosphoric, nitric, hydrochloric, chromic, sulfonic) may generate heat, splattering or boiling and toxic vapors. Evolves sulfur dioxide (SO2) when open to atmosphere. The rate of SO2 evolution increases with temperature and/or transfer of product. Sulfur dioxide may react with vapors from neutralizing amines and may

form a visible cloud of amine salt particles.

Hazardous decomposition

products

Decomposition products may include the following materials:

Carbon oxides nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus

Section: 11. TOXICOLOGICAL INFORMATION

exposure

Information on likely routes of : Inhalation, Eye contact, Skin contact

Potential Health Effects

Eyes Health injuries are not known or expected under normal use. Skin Health injuries are not known or expected under normal use.

Harmful if swallowed. Ingestion

Inhalation Health injuries are not known or expected under normal use.

Chronic Exposure Health injuries are not known or expected under normal use.

Experience with human exposure

Eye contact No symptoms known or expected. Skin contact No symptoms known or expected.

No information available. Ingestion

Inhalation No symptoms known or expected.

Toxicity

Product



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Acute oral toxicity : LD50 rat: 500 mg/kg

Test substance: Similar Product

Acute inhalation toxicity : no data available

Acute dermal toxicity : LD50 rabbit: 3 g/kg

Test substance: Similar Product

Skin corrosion/irritation : Species: Rabbit

Result: 1.0

Method: Draize Test

Test substance: Similar Product

Serious eye damage/eye

irritation

Species: rabbit Result: 9.4

Method: Draize Test

Test substance: Similar Product

Respiratory or skin

sensitization

no data available

Carcinogenicity : no data available
Reproductive effects : no data available
Germ cell mutagenicity : no data available
Teratogenicity : no data available
STOT - single exposure : no data available
STOT - repeated exposure : no data available
Aspiration toxicity : no data available

Section: 12. ECOLOGICAL INFORMATION

Ecotoxicity

Environmental Effects : This product has no known ecotoxicological effects.

Product

Toxicity to fish : LC50 Oncorhynchus mykiss (rainbow trout): > 100 mg/l

Exposure time: 96 hrs Test substance: Product

LC50 Pimephales promelas (fathead minnow): 382 mg/l

Exposure time: 96 hrs

Test substance: Similar Product

LC50 Gambusia affinis (Mosquito fish): 240 mg/l

Exposure time: 96 hrs

Test substance: Active Substance

NOEC Pimephales promelas (fathead minnow): 250 mg/l

Exposure time: 96 hrs

Test substance: Similar Product

Toxicity to daphnia and other

aquatic invertebrates

LC50 Daphnia magna (Water flea): 728 mg/l

Exposure time: 48 hrs

6/11



NALCO® 7408

Test substance: Similar Product

LC50 Daphnia magna (Water flea): 275 mg/l

Exposure time: 48 hrs Test substance: Product

LC50 Daphnia magna (Water flea): 119 mg/l

Exposure time: 48 hrs

Test substance: Active Substance

NOEC Daphnia magna (Water flea): 250 mg/l

Exposure time: 48 hrs

Test substance: Similar Product

Toxicity to fish (Chronic

toxicity)

: EC25 / IC25: 382 mg/l Exposure time: 7 Days Species: Fathead Minnow Test substance: Product

LOEC: 500 mg/l Exposure time: 7 Days Species: Fathead Minnow Test substance: Product

NOEC: 250 mg/l Exposure time: 7 Days Species: Fathead Minnow Test substance: Product

EXPOSURE time: 7 Days
Species: Ceriodaphnia dubia
Test substance: Product
Test Type: 3 Brood

EC25 / IC25: 277 mg/l Exposure time: 7 Days Species: Ceriodaphnia dubia Test substance: Product Test Type: 3 Brood

NOEC: 250 mg/l Exposure time: 7 Days Species: Ceriodaphnia dubia Test substance: Product Test Type: 3 Brood

Persistence and degradability

Greater than 95% of this product consists of inorganic substances for which a biodegradation value is not applicable.

Chemical Oxygen Demand (COD): 85,000 mg/l

Mobility



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The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.

If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air <5% Water 30 - 50% Soil 50 - 70%

The portion in water is expected to be soluble or dispersible.

Bioaccumulative potential

This preparation or material is not expected to bioaccumulate.

Other information

no data available

Section: 13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it is not a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

Disposal methods Where possible recycling is preferred to disposal or

incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in an

approved waste disposal facility.

Disposal considerations : Dispose of as unused product. Empty containers should be

taken to an approved waste handling site for recycling or

disposal. Do not re-use empty containers.

Section: 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

The presence of an RQ component (Reportable Quantity for U.S. DOT) in this product causes it to be regulated with an additional description of RQ for road, or as Environmentally hazardous for road and air, ONLY when the net weight in the package exceeds the calculated RQ for the product.

8/11

Land transport (DOT)

BISULPHITES, AQUEOUS SOLUTION, N.O.S. Proper shipping name

Technical name(s) SODIUM BISULPHITE

UN/ID No. UN 2693 Transport hazard class(es) 8

Packing group Ш

Reportable Quantity (per : 12,500 lbs

package) RQ Component : SODIUM BISULFITE

LA-UR-19-22215



NALCO® 7408

Air transport (IATA)

Proper shipping name : BISULPHITES, AQUEOUS SOLUTION, N.O.S.

Technical name(s) : SODIUM BISULPHITE

UN/ID No. : UN 2693

Transport hazard class(es) 8
Packing group III

Reportable Quantity (per : 12,500 lbs

package)

RQ Component : SODIUM BISULFITE

Sea transport (IMDG/IMO)

Proper shipping name : BISULPHITES, AQUEOUS SOLUTION, N.O.S.

Technical name(s) : SODIUM BISULPHITE

UN/ID No. : UN 2693

Transport hazard class(es) : 8
Packing group : III

Section: 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Sodium Bisulfite	7631-90-5	5000	12500

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Acute Health Hazard

SARA 302 : No chemicals in this material are subject to the reporting requirements

of SARA Title III, Section 302.

SARA 313 : This material does not contain any chemical components with known

CAS numbers that exceed the threshold (De Minimis) reporting levels

established by SARA Title III, Section 313.

California Prop 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

INTERNATIONAL CHEMICAL CONTROL LAWS:

United States TSCA Inventory

The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

Australia. Industrial Chemical (Notification and Assessment) Act

All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).



NALCO® 7408

Canadian Domestic Substances List (DSL)

The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

Japan. ENCS - Existing and New Chemical Substances Inventory

All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

Korea. Korean Existing Chemicals Inventory (KECI)

All substances in this product comply with the Chemical Control Act (CCA) and are listed on the Existing Chemicals List (ECL)

Philippines Inventory of Chemicals and Chemical Substances (PICCS)

All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

China Inventory of Existing Chemical Substances

All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on or exempt from the Inventory of Existing Chemical Substances China (IECSC).

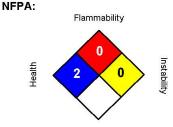
New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand

All substances in this product comply with the Hazardous Substances and New Organisms (HSNO) Act 1996, and are listed on or are exempt from the New Zealand Inventory of Chemicals.

Taiwan Chemical Substance Inventory

All substances in this product comply with the Taiwan Existing Chemical Substances Inventory (ECSI).

Section: 16. OTHER INFORMATION



Special hazard.

HMIS III:



0 = not significant, 1 = Slight,

2 = Moderate, 3 = High 4 = Extreme, * = Chronic

Revision Date 03/09/2017

Version Number 1.3

Prepared By : Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use,



NALCO® 7408

processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. For additional copies of an SDS visit www.nalco.com and request access.



MAGNESIUM CHLORIDE



SIGMA-ALDRICH

sigma-aldrich.com

SAFETY DATA SHEET

Version 5.6 Revision Date 12/05/2017 Print Date 12/16/2017

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name Magnesium chloride solution

Product Number : M1028 Brand : Sigma

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich

3050 Spruce Street SAINT LOUIS MO 63103

USA

Telephone : +1 800-325-5832 Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Not a hazardous substance or mixture.

2.2 GHS Label elements, including precautionary statements

Not a hazardous substance or mixture.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Formula : Cl₂MgCl₂Mg Molecular weight : 95.21 g/mol

No components need to be disclosed according to the applicable regulations.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration.

Sigma - M1028 Page 1 of 6



In case of skin contact

Wash off with soap and plenty of water.

In case of eye contact

Flush eyes with water as a precaution.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Avoid breathing vapours, mist or gas.

For personal protection see section 8.

6.2 Environmental precautions

Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Storage class (TRGS 510): 12: Non Combustible Liquids

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Appropriate engineering controls

General industrial hygiene practice.

Sigma - M1028 Page 2 of 6



Personal protective equipment

Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection

Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Respiratory protection not required. For nuisance exposures use type OV/AG (US) or type ABEK (EU EN 14387) respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	рН	No data available
e)	Melting point/freezing point	No data available
f)	Initial boiling point and boiling range	No data available
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
I)	Vapour density	No data available
m)	Relative density	1.080 g/cm3
n)	Water solubility	No data available
0)	Partition coefficient: n- octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

Sigma - M1028 Page 3 of 6



9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

No data available

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Hydrogen chloride gas, Magnesium oxide Hazardous decomposition products formed under fire conditions. - Hydrogen chloride gas, Magnesium oxide Other decomposition products - No data available In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

No data available

Inhalation: No data available Dermal: No data available

No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

No component of this product present at levels greater than or equal to 0.1% is identified as IARC:

probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a

carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a

known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a

carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

No data available No data available

Sigma - M1028 Page 4 of 6



Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence (Magnesium chloride)

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No data available

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

Not dangerous goods

Not dangerous goods

IATA

Not dangerous goods

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Chronic Health Hazard

Massachusetts Right To Know Components

Sigma - M1028 Page 5 of 6

LA-UR-19-22215 Attachment E

Revision Date

Revision Date



No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

 Water
 7732-18-5

 Magnesium chloride
 7786-30-3

New Jersey Right To Know Components

 Water
 7732-18-5

 Magnesium chloride
 7786-30-3

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

HMIS Rating

Health hazard: 0
Chronic Health Hazard: Flammability: 0
Physical Hazard 0

NFPA Rating

Health hazard: 0
Fire Hazard: 0
Reactivity Hazard: 0

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 5.6 Revision Date: 12/05/2017 Print Date: 12/16/2017

Sigma - M1028 Page 6 of 6



SODIUM HYDROXIDE





Univar USA Inc Material Safety Data Sheet

MSDS No:	OZ32415			
Version No:	026 2010-05-20			
Order No:				

Univar USA Inc., 17425 NE Union Hill Rd., Redmond WA 98052 (425) 889 3400

Emergency Assistance

For emergency assistance involving chemicals call Chemtrec - (800) 424-9300



UNIVAR USA INC. ISSUE DATE:2009-02-27 Annotation:

MSDS NO:OZ32415 VERSION:026 2010-05-20

The Version Date and Number for this MSDS is: 02/27/2009 - #321

PRODUCT NAME:

CAUSTIC SODA LIQUID (ALL GRADES)

MSDS NUMBER:

OZ32415

DATE ISSUED:

01/07/2009

SUPERSEDES:

11/12/2008

ISSUED BY:

008730

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Distributed by: Univar USA Inc. 17425 NE Union Hill Rd. Redmond, WA 98052 425-889-3400

Trade Name:

Caustic Soda Diaphragm Grade 10%, 15%, 18%, 20%, 25%, 30%, 35%, 40%, 50%, Caustic Soda Rayon Grade 18%, 20%, 25%, 30%, 50%, 50% Caustic Soda Rayon Grade OS, Caustic Soda Membrane 6%, 18%, 20%, 25%, 30%, 48%, 50%, 50% Caustic Soda Membrane OS, 50% Caustic Soda Diaphragm OS, Caustic Soda Low Salt 50%, 25% Caustic Soda Purified, 50% Caustic Soda Purified OS, Caustic Soda Liquid 70/30, Membrane Blended, 50% Caustic Soda Membrane (Northeast), 50% Caustic Soda Diaphragm (West Coast), 50% Blended Rayon Grade Blended, Membrane Cell Liquor

Synonyms: Sodium hydroxide solution, Liquid Caustic, Lye Solution, Caustic, Lye, Soda Lye

Product Use: Metal finishing, Cleaner, Process chemical, Petroleum industry

2. HAZARDS IDENTIFICATION EMERGENCY OVERVIEW:

Color:

Colorless to slightly colored

Physical State:

Liquid Odorless

Signal Word:

Danger

MAJOR HEALTH HAZARDS: CORROSIVE. CAUSES BURNS TO THE RESPIRATORY TRACT, SKIN, EYES AND GASTROINTESTINAL TRACT. CAUSES PERMANENT EYE DAMAGE.



UNIVAR USA INC. ISSUE DATE:2009-02-27 Annotation:

MSDS NO:0Z32415 VERSION:026 2010-05-20

PHYSICAL HAZARDS: CORROSIVE. Mixing with water, acid or incompatible materials may cause splattering and release of heat.

ECOLOGICAL HAZARDS: Keep out of water supplies and sewers. This material is alkaline and may raise the pH of surface waters. This material has exhibited moderate toxicity to aquatic organisms.

PRECAUTIONARY STATEMENTS: Avoid breathing vapors or mist. Avoid contact with skin, eyes and clothing. Keep container tightly closed. Wash thoroughly after handling. Use only with adequate ventilation.

POTENTIAL HEALTH EFFECTS:

Inhalation: May cause irritation (possibly severe), chemical burns, and pulmonary edema.

Skin contact: May cause irritation (possibly severe) and chemical burns.

Eye contact: May cause irritation (possibly severe), chemical burns, eye damage, and blindness.

Ingestion: May cause irritation (possibly severe), chemical burns, nausea, and vomiting.

Target Organs Effected: Respiratory System, Skin, Eye

Medical Conditions Aggravated by Exposure: Asthma, Respiratory disorders

See Section 11: TOXICOLOGICAL INFORMATION

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Component	Concentration (by weight %)	CAS - No.
Water	48.5 - 94.5	7732-18-5
Sodium hydroxide	5.5 - 51.5	1310-73-2
Sodium chloride (NaCl)	1 - 5	7647-14-5

4. FIRST AID MEASURES

Inhalation: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. If respiration or pulse has stopped, have a trained person administer basic life support (Cardio-Pulmonary Resuscitation/Automatic External Defibrillator) and CALL FOR EMERGENCY SERVICES IMMEDIATELY.

Skin Contact: Immediately flush contaminated areas with water. Remove contaminated clothing, jewelry, and shoes immediately. Wash contaminated areas with soap and water. Thoroughly clean and dry contaminated clothing before reuse. Discard contaminated leather goods. GET MEDICAL ATTENTION

LA-UR-19-22215 Attachment E



UNIVAR USA INC. ISSUE DATE:2009-02-27 Annotation:

MSDS NO:0Z32415 VERSION:026 2010-05-20

TMMEDIATELY.

Eye Contact: Immediately flush eyes with a directed stream of water for at least 15 minutes, forcibly holding eyelids apart to ensure complete irrigation of all eye and lid tissues. Washing eyes within several seconds is essential to achieve maximum effectiveness. GET MEDICAL ATTENTION IMMEDIATELY.

Ingestion: Never give anything by mouth to an unconscious or convulsive person. If swallowed, do not induce vomiting. Give large amounts of water. If vomiting occurs spontaneously, keep airway clear. Give more water when vomiting stops. GET MEDICAL ATTENTION IMMEDIATELY.

Notes to Physician: The absence of visible signs or symptoms of burns does NOT reliably exclude the presence of actual tissue damage. Probable mucosal damage may contraindicate the use of gastric lavage.

5. FIRE-FIGHTING MEASURES

Fire Hazard: Negligible fire hazard.

Extinguishing Media: Use media appropriate for surrounding fire

Fire Fighting: Move container from fire area if it can be done without risk. Cool containers with water. Avoid contact with skin.

Sensitivity to Mechanical Impact: Not sensitive.

Sensitivity to Static Discharge: Not sensitive.

Flash point: Not flammable

6. ACCIDENTAL RELEASE MEASURES

Occupational Release:

Wear appropriate personal protective equipment recommended in Section 8 of the MSDS. Completely contain spilled material with dikes, sandbags, etc. Shovel dry material into suitable container. Liquid material may be removed with a vacuum truck. Remaining material may be diluted with water and neutralized with dilute acid, then absorbed and collected. Flush spill area with water, if appropriate. Keep product and flush water out of water supplies and sewers. This material is alkaline and may raise the pH of surface waters with low buffering capacity. Releases should be reported, if required, to appropriate agencies.

7. HANDLING AND STORAGE

Storage Conditions: Store and handle in accordance with all current regulations and standards. Keep container tightly closed and properly labeled. Do not store in aluminum container or use aluminum fittings or transfer lines, as flammable hydrogen gas may be generated. Keep separated

LA-UR-19-22215 Attachment E E-26 of 96



UNIVAR USA INC. ISSUE DATE:2009-02-27 Annotation:

MSDS NO:OZ32415 VERSION:026 2010-05-20

from incompatible substances.

Handling Procedures: Avoid breathing vapor or mist. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. When mixing, slowly add to water to minimize heat generation and spattering.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

CSHA Regulatory Exposure limit(s):

Hazardous

Component CAS-No. CSHA Final PEL OSHA Final PEL OSHA Final PEL

TWA STEL Ceiling

Sodium 1310-73-2 2 mg/m3

hydroxide

Non-Regulatory Exposure Limit(s):

The Non-Regulatory OSHA limits shown in the table are the Vacated 1989 PEL's (vacated by 58 FR 35338, June 30, 1993).

Hazardous

Component CAS-No. ACGIH ACGIH ACGIH OSHA OSHA OSHA Ceiling

TWA STEL Ceiling TWA STEL (Vacated)

(Vaca- (Vacated) ted)

Sodium 1310-73-2 2 mg/m3 2 mg/m3

hydroxide

ENGINEERING CONTROLS: Provide local exhaust ventilation where dust or mist may be generated. Ensure compliance with applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Wear chemical safety goggles with a faceshield to protect against eye and skin contact when appropriate. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin and Body Protection: Wear chemical resistant clothing and rubber boots when potential for contact with the material exists. Contaminated clothing should be removed, then discarded or laundered.

Hand Protection: Wear appropriate chemical resistant gloves Protective Material Types: Natural rubber, Neoprene, Nitrile

Hazardous Component Immediately Dangerous to Life/ Health (IDLH)
Sodium hydroxide 10 mg/m3 IDLH

Respiratory Protection: A NIOSH approved respirator with N95 (dust, fume, mist) cartridges may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits, or when symptoms have been observed that are indicative of overexposure. If eye



UNIVAR USA INC. ISSUE DATE:2009-02-27 Annotation:

MSDS NO:0Z32415 VERSION:026 2010-05-20

irritation occurs, a full face style mask should be used. A respiratory protection program that meets 29 CFR 1910.134 must be followed whenever workplace conditions warrant use of a respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:

Appearance: Clear to opaque

Color: Colorless to slightly colored

Odorless

Boiling Point/Range: 230 291 F (110 144 C)
Freezing Point/Range: -26 to 59 F (-32 to 15 C) 13 - 135 mmHg @ 60 C Vapor Pressure: Vapor Density (air=1): No data available

Water Solubility: 100%

14.0 (7.5% solution) No data available Volatility: Evaporation Rate (ether=1): No data available Partition Coefficient (n- No data available

octanol/water):

10. STABILITY AND REACTIVITY

Reactivity/ Stability: Stable at normal temperatures and pressures.

Conditions to Avoid: Mixing with water, acid or incompatible materials may cause splattering and release of large amounts of heat. Will react with some metals forming flammable hydrogen gas. Carbon monoxide gas may form upon contact with reducing sugars, food and beverage products in enclosed spaces.

Incompatibilities/Materials to Avoid: Acids, Halogenated compounds, Prolonged contact with aluminum, brass, bronze, copper, lead, tin, zinc or other alkali sensitive metals or allovs

Hazardous Decomposition Products: Toxic fumes of sodium oxide

Will not occur Hazardous Polymerization:

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA:

Hazardous Component LD50 Oral LC50 Inhalation LD50 Dermal Sodium hydroxide Not listed Not listed 1350 mg/kg (Rabbit) Sodium chloride (NaCl) 3 g/kg (Rat) 42 g/m3 (1 hr-Rat) 10 g/kg (Rabbit)

The severity of the tissue damage is a function of its concentration, the length of tissue contact time, and local tissue conditions. After exposure there may be a time delay before irritation and other effects occur. This material is a strong irritant and is corrosive to the skin, eyes, and mucous

LA-UR-19-22215 Attachment E



UNIVAR USA INC. ISSUE DATE:2009-02-27 Annotation:

MSDS NO:OZ32415 VERSION:026 2010-05-20

membranes. This material may cause severe burns and permanent damage to any tissue with which it comes into contact. Inhalation will cause severe irritation and possible burns with pulmonary edema, which may lead to pneumonitis. Skin contact with this material may cause severe irritation and corrosion of tissue. Eye contact can cause severe irritation, corrosion with possible corneal damage and blindness. Ingestion may cause irritation, corrosion/ulceration, nausea, and vomiting. In general, chronic effects are due to long-term irritation. This material may cause dermatitis. In rare cases reports have noted long-term inhalation causes bronchial inflammatory reaction or obstructive airway dysfunction.

CARCINOGENICITY: This product is not classified as a carcinogen by NTP, IARC or OSHA.

12. ECOLOGICAL INFORMATION

AQUATIC TOXICITY: This material has exhibited moderate toxicity to aquatic organisms. Data provided are for sodium hydroxide.

Freshwater Fish Data:

LC50 brook trout: 25 ppm/24 hr LC50 king salmon: 48 ppm

Invertebrate Toxicity Data: EC50 daphnia magna: 100 ppm EC50 shrimp: 33 100 ppm/48 hr EC50 cockle: 330 1000 ppm/48 hr

BIODEGRADATION: This material is inorganic and not subject to biodegradation.

PERSISTENCE: This material is alkaline and may raise the pH of surface waters with low buffering capacity. This material is believed to exist in the disassociated state in the environment.

BIOCONCENTRATION: This material is not expected to bioconcentrate in organisms.

ADDITIONAL ECOLOGICAL INFORMATION: This material has exhibited slight toxicity to terrestrial organisms.

13. DISPOSAT CONSIDERATIONS

Reuse or reprocess, if possible. Dispose in accordance with all applicable regulations. May be subject to disposal regulations: U.S. EPA 40 CFR 261. Hazardous Waste Number(s): D002

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME: Sodium Hydroxide Solution

DOT UN NUMBER: UN1824



UNIVAR USA INC. ISSUE DATE:2009-02-27 Annotation: MSDS NO:OZ32415 VERSION:026 2010-05-20

HAZARD CLASS/ DIVISION: 8
PACKING GROUP: 13
LABELING REQUIREMENTS: 8

DOT RQ (lbs): RQ 1000 lbs. (Sodium Hydroxide)

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

SHIPPING NAME:

Sodium hydroxide solution

UN NUMBER: UN1824
CLASS: 8
PACKING/RISK GROUP: II

15. REGULATORY INFORMATION

U.S. REGULATIONS

OSHA REGULATORY STATUS:

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200) (US).

CERCLA SECTIONS 102al103 HAZARDOUS SUBSTANCES (40 CFR 302.4):

If a release is reportable under CERCLA section 103, notify the state cmergency response commission and local emergency planning committee. In addition, notify the National Response Center at (800) 424-8802 or (202) 4262675.

Hazardous Component Sodium hydroxide CERCLA Reportable Quantities: 1000 lb (final RQ)

EPCRA EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30): No components are listed.

EPCRA SECTIONS 311/312 HAZARD CATEGORIES (40 CFR 370.21): Acute Health Hazard

EPCRA SECTION 313 (40 CFR 372.65): No components are listed.

OSHA PROCESS SAFETY (29 CFR 1910.119): Not regulated

NATIONAL INVENTORY STATUS

U.S. INVENTORY STATUS (TSCA): All components are listed or exempt

TSCA 12(b): This product is not subject to export notification

CANADIAN DOMESTIC SUBSTANCE LIST (DSL/NDSL): All components are listed.

STATE REGULATIONS

California Proposition 65: This product is not listed

Hazardous Component Sodium hydroxide



UNIVAR USA INC. ISSUE DATE:2009-02-27 Annotation: MSDS NO:OZ32415 VERSION:026 2010-05-20

California Proposition 65 Cancer WARNING: Not Listed California Proposition 65 CRT List - Male Not Listed reproductive toxin: California Proposition 65 CRT List - Female reproductive toxin: Not Listed Massachusetts Right to Know Hazardous Substance List New Jersey Right to Know Hazardous Substance List New Jersey Special Health Hazards Substance List Listed Pennsylvania Right to Know Hazardous Substance List Listed Pennsylvania Right to Know Environmental Hazard List Listed Rhode Island Right to Know Hazardous Substance List Listed

CANADIAN REGULATIONS:

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

WHMIS Classification: E

16. OTHER INFORMATION

HMIS: (SCALE 0-4) (Rated using National Paint & Coatings Association HMIS:

Rating Instructions, 2nd Edition)

Health: 3 Flammability: 0 Reactivity: 1

NFPA 704 - Hazard Identification Ratings (SCALE 0-4)



Univar USA Inc Material Safety Data Sheet

For Additional Information contact MSDS Coordinator during business hours, Pacific time: (425) 889-3400

Notice

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Do not use ingredient information and/or ingredient percentages in this MSDS as a product specification. For product specification information refer to a product specification sheet and/or a certificate of analysis. These can be obtained from your local Univar sales office.

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This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process



HYDROCHLORIC ACID



SIGMA-ALDRICH

sigma-aldrich.com

SAFETY DATA SHEET

Version 5.12 Revision Date 04/26/2018 Print Date 05/05/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Hydrochloric acid

 Product Number
 : 258148

 Brand
 : Sigma-Aldrich

 Index-No.
 : 017-002-01-X

 CAS-No.
 : 7647-01-0

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich

3050 Spruce Street SAINT LOUIS MO 63103

USA

Telephone : +1 800-325-5832 Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Corrosive to metals (Category 1), H290 Skin corrosion (Category 1B), H314 Serious eye damage (Category 1), H318

Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)

H290 May be corrosive to metals.

H314 Causes severe skin burns and eye damage.

H335 May cause respiratory irritation.

Precautionary statement(s)

P234 Keep only in original container.

P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

P264 Wash skin thoroughly after handling.

P271 Use only outdoors or in a well-ventilated area.

P280 Wear protective gloves/ protective clothing/ eye protection/ face

protection.

Sigma-Aldrich - 258148 Page 1 of 8



P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing.
	Rinse skin with water/shower.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for
	breathing. Immediately call a POISON CENTER/doctor.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove
	contact lenses, if present and easy to do. Continue rinsing. Immediately
	call a POISON CENTER/doctor.
P363	Wash contaminated clothing before reuse.
P390	Absorb spillage to prevent material damage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P406	Store in corrosive resistant container with a resistant inner liner.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Formula : HCl Molecular weight : 36.46 g/mol

Hazardous components

Component		Classification	Concentration
Hydrochloric acid			
EC-No.	231-595-7	Met. Corr. 1; Skin Corr. 1B;	30 - 50 %
Index-No.	017-002-01-X	Eye Dam. 1; STOT SE 3;	20 42 42 5500
Registration number	01-2119484862-27-XXXX	H290, H314, H335	

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

Sigma-Aldrich - 258148 Page 2 of 8



5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.

For personal protection see section 8.

6.2 Environmental precautions

Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Metal containers must be lined. Corrodes metal

Storage class (TRGS 510): 8B: Non-combustible, corrosive hazardous materials

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Components with workplace control parameters					
Component	CAS-No.	Value	Control parameters	Basis	
Hydrochloric acid		С	2 ppm	USA. ACGIH Threshold Limit Values (TLV)	
	Remarks		spiratory Tract irrita ïable as a human d		
		С	5 ppm 7 mg/m3	USA. NIOSH Recommended Exposure Limits	
		Often used in an aqueous solution.			
		С	5 ppm 7 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants	
		The value in mg/m3 is approximate.			

Sigma-Aldrich - 258148 Page 3 of 8



Ceiling limit is to be determined from breathing-zone air samples.		
PEL	0.3 ppm 0.45 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
С	2 ppm	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 **Exposure controls**

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eve/face protection

Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.4 mm Break through time: 480 min

Material tested: Camatril® (KCL 730 / Aldrich Z677442, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 69 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multipurpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance Form: liquid

Colour: light yellow

Odour pungent b)

c) Odour Threshold No data available

< 1 d) pH

Sigma-Aldrich - 258148 Page 4 of 8

LA-UR-19-22215 Attachment E



e) Melting point/freezing Solidification / Setting point: -30 °C (-22 °F)

point

Initial boiling point and > 100 °C (> 212 °F) - lit.

boiling range

g) Flash point Not applicable Evaporation rate No data available Flammability (solid, gas) No data available Upper/lower No data available

flammability or explosive limits

Vapour pressure 227 hPa (170 mmHg) at 21.1 °C (70.0 °F)

547 hPa (410 mmHg) at 37.7 °C (99.9 °F) 190 hPa (143 mmHg) at 20 °C (68 °F)

I) Vapour density No data available

m) Relative density 1.2 g/cm3 at 25 °C (77 °F) n) Water solubility completely miscible No data available

Partition coefficient: n-

octanol/water Auto-ignition

No data available

temperature Decomposition

No data available

temperature Viscosity r)

No data available

Explosive properties Not explosive

Oxidizing properties The substance or mixture is not classified as oxidizing

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

Corrosive in contact with metals

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Exothermic reaction with:, Amines, Aldehydes, permanganates, e.g. potassium permanganate, Risk of ignition or formation of inflammable gases or vapours with:, Aluminium, Carbides, Fluorine, Metals, Bases, Sulphides, Risk of explosion with:, Alkali metals, Sulphuric acid, Gives off hydrogen by reaction with metals.

Conditions to avoid

No data available

10.5 Incompatible materials

Metals

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Hydrogen chloride gas Other decomposition products - No data available

In the event of fire: see section 5

Sigma-Aldrich - 258148 Page 5 of 8



11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

No data available (Hydrochloric acid)

Inhalation: Inhalation may provoke the following symptoms: Respiratory irritation Cough Difficulty in breathing Pneumonia (Hydrochloric acid)

Dermal: No data available (Hydrochloric acid)

No data available (Hydrochloric acid)

Skin corrosion/irritation

Skin - Rabbit (Hydrochloric acid)

Result: Causes burns.

Serious eye damage/eye irritation

Eyes - Rabbit (Hydrochloric acid)

Result: Corrosive to eyes

Respiratory or skin sensitisation

Did not cause sensitisation on laboratory animals. (Hydrochloric acid)

Germ cell mutagenicity

No data available (Hydrochloric acid)

Carcinogenicity

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification. (Hydrochloric acid)

(Hydrochloric acid)

(Hydrochloric acid)

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as

probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a

known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's

list of regulated carcinogens.

Reproductive toxicity

No data available (Hydrochloric acid)

No data available (Hydrochloric acid)

Specific target organ toxicity - single exposure

The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation. (Hydrochloric acid)

Specific target organ toxicity - repeated exposure

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration hazard

No aspiration toxicity classification (Hydrochloric acid)

Additional Information

RTECS: MW4025000

Inhalation of vapors may cause:, burning sensation, Cough, wheezing, Shortness of breath, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema (Hydrochloric acid)

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish LC50 - Lepomis macrochirus (Bluegill) - 24.6 mg/l - 96 h (Hydrochloric acid)

Sigma-Aldrich - 258148 Page 6 of 8

LA-UR-19-22215 Attachment E E-39 of 96



Toxicity to daphnia and EC50 - Daphnia magna (Water flea) - 4.91 mg/l - 48 h (Hydrochloric acid) other aquatic invertebrates

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available (Hydrochloric acid)

Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

May be harmful to aquatic organisms due to the shift of the pH. Do not empty into drains.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 1789 Class: 8 Packing group: II

Proper shipping name: Hydrochloric acid

Reportable Quantity (RQ): Poison Inhalation Hazard: No

IMDG

IATA

UN number: 1789 Class: 8 Packing group: II

Proper shipping name: Hydrochloric acid

15. REGULATORY INFORMATION

SARA 302 Components

This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Acute Health Hazard

Massachusetts Right To Know Components

Revision Date CAS-No. Hydrochloric acid 2013-02-08

Pennsylvania Right To Know Components

CAS-No. Revision Date Water 7732-18-5

2013-02-08 Hydrochloric acid

Sigma-Aldrich - 258148 Page 7 of 8

LA-UR-19-22215 Attachment E E-40 of 96



California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Eye Dam. Serious eye damage H290 May be corrosive to metals.

H314 Causes severe skin burns and eye damage.

H318 Causes serious eye damage. H335 May cause respiratory irritation.

Met. Corr. Corrosive to metals Skin Corr. Skin corrosion

STOT SE Specific target organ toxicity - single exposure

HMIS Rating

Health hazard: 3
Chronic Health Hazard: *
Flammability: 0
Physical Hazard 0

NFPA Rating

Health hazard: 3
Fire Hazard: 0
Reactivity Hazard: 0

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 5.12 Revision Date: 04/26/2018 Print Date: 05/05/2018

Sigma-Aldrich - 258148 Page 8 of 8



SODIUM HYPOCHLORITE





SAFETY DATA SHEET

Creation Date 25-October-2010 Revision Date 24-January-2018 Revision Number 4

1. Identification

Product Name Sodium hypochlorite, 5% active chlorine

Cat No.: AC419550000; AC419550010; AC419550025; AC419550100;

AC419550250; AC419552500

CAS-No 7681-52-9

Synonyms Sodium Oxychloride.; Antiformin; Sodium Chloride Oxide

Recommended Use Laboratory chemicals

Uses advised against Not for food, drug, pesticide or biocidal product use

Details of the supplier of the safety data sheet

Company

Importer/Distributor
Fisher Scientific
112 Colonnade Road,
Ottawa, ON K2E 7L6,
Canada

Tel: 1-800-234-7437

Acros Organics One Reagent Lane Fair Lawn, NJ 07410 Manufacturer Fisher Scientific

One Reagent Lane Fair Lawn, NJ 07410 Tel: (201) 796-7100

Emergency Telephone Number

For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11 Emergency Number **US**:001-201-796-7100 / **Europe**: +32 14 57 52 99 **CHEMTREC** Tel. No. **US**:001-800-424-9300 / **Europe**:001-703-527-3887

2. Hazard(s) Identification

Classification

WHMIS 2015 Classification Classified as hazardous under the Hazardous Products Regulations (SOR/2015-17)

Corrosive to metals
Skin Corrosion/irritation
Serious Eye Damage/Eye Irritation
Specific target organ toxicity (single exposure)
Category 1
Specific target Organs - Respiratory system.

Health Hazards Not Otherwise Classified Category 1
Contact with acids liberates toxic gas

Contact with acras liberates toxi

Label Elements

Signal Word

Danger

Hazard Statements

May be corrosive to metals Causes severe skin burns and eye damage May cause respiratory irritation

Page 1/7



Revision Date 24-January-2018

Contact with acids liberates toxic gas



Precautionary Statements

Prevention

Take any precaution to avoid mixing with acids Do not breathe dust/fumes/gas/mist/vapours/spray Wear respiratory protection

Keep only in original container

Wash face, hands and any exposed skin thoroughly after handling

Use only outdoors or in a well-ventilated area

Wear protective gloves/protective clothing/eye protection/face protection

IF INHALED: Remove person to fresh air and keep comfortable for breathing

Immediately call a POISON CENTER/doctor

IF SWALLOWED: Rinse mouth, Do NOT induce vomiting

IF ON SKIN (or hair): Take off immediately all contaminated clothing, Rinse skin with water/ shower

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing Wash contaminated clothing before reuse

Absorb spillage to prevent material damage

Storage

Store locked up

Store in a well-ventilated place. Keep container tightly closed

Store in corrosive resistant polypropylene container with a resistant inliner

Store in a dry place

Disposal

Dispose of contents/container to an approved waste disposal plant

Other Hazards

Very toxic to aquatic life with long lasting effects

Light sensitive

3. Composition/Information on Ingredients

Component	CAS-No	Weight %
Water	7732-18-5	95.5
Sodium hypochlorite	7681-52-9	4.5

4. First-aid measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Immediate medical attention is required.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Immediate medical

attention is required.

Inhalation Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth method if

victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate

medical attention is required.

Page 2/7



Revision Date 24-January-2018

Ingestion Do not induce vomiting. Call a physician or Poison Control Center immediately.

Most important symptoms/effects Causes burns by all exposure routes. Product is a corrosive material. Use of gastric

lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should

be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue

and danger of perforation

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media Substance is nonflammable; use agent most appropriate to extinguish surrounding fire.

Unsuitable Extinguishing Media No information available

Flash Point No information available Method - No information available

Autoignition Temperature

Explosion Limits

No information available

Upper No data available
Lower No data available
Sensitivity to Mechanical Impact No information available
Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical

Corrosive Material. Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. Keep product and empty container away from heat and sources of ignition.

Hazardous Combustion Products

Carbon monoxide (CO) Carbon dioxide (CO2) Hydrogen chloride gas Sodium oxides

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health Flammability Instability Physical hazards
3 0 1 N/A

6. Accidental release measures

Personal Precautions

Use personal protective equipment. Evacuate personnel to safe areas. Ensure adequate

ventilation. Do not get in eyes, on skin, or on clothing.

Environmental Precautions Should not be released into the environment. See Section 12 for additional ecological information. Avoid released to the environment. Cellect spilled.

information. Avoid release to the environment. Collect spillage.

Methods for Containment and Clean Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Up

	7. 1	Hand	dlin	ıg	and	st	or	age	

Handling Use only under a chemical fume hood. Wear personal protective equipment. Ensure

adequate ventilation. Do not get in eyes, on skin, or on clothing. Avoid ingestion and

inhalation.

Storage Keep containers tightly closed in a dry, cool and well-ventilated place. Keep refrigerated.

Keep away from direct sunlight. Corrosives area.

8. Exposure controls / personal protection

Exposure Guidelines This product does not contain any hazardous materials with occupational exposure

limitsestablished by the region specific regulatory bodies.

Page 3/7



Revision Date 24-January-2018

Engineering Measures

Use only under a chemical fume hood. Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source

Personal protective equipment

Eve Protection Goggles **Hand Protection** Protective gloves

Γ	Glove material	Breakthrough time	Glove thickness	Glove comments
L	Butyl rubber	See manufacturers	20	Splash protection only
L		recommendations		

Inspect gloves before use, observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information) gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion. gloves with care avoiding skin contamination.

Respiratory Protection

When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced. To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly Recommended Filter type: Particulates filter conforming to EN 143 or Acid gases filter Type E Yellow conforming to FN14387

When RPE is used a face piece Fit Test should be conducted

Environmental exposure controls

Prevent product from entering drains. Do not allow material to contaminate ground water system. Local authorities should be advised if significant spillages cannot be contained.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing before re-use. Wash hands before breaks and at the end of workday.

9. Physical and chemical properties					
Physical State	Liquid				
Appearance	Yellow				
Odor	pungent				
Odor Threshold	No information available				
pH	No information available				
Melting Point/Range	No data available				
Boiling Point/Range	No information available				
Flash Point	No information available				
Evaporation Rate	No information available				
Flammability (solid,gas)	Not applicable				
Flammability or explosive limits	or terrorized American				
Upper	No data available				
Lower	No data available				
Vapor Pressure	17.5 mmHg @ 20 °C				
Vapor Density	2.57				
Specific Gravity	1.083				
* **					

Page 4/7

LA-UR-19-22215 Attachment E E-46 of 96



Revision Date 24-January-2018

Solubility
Partition coefficient; n-octanol/water
Autoignition Temperature
Decomposition Temperature
Viscosity

No information available
No information available
No information available
No information available

Molecular FormulaCI Na OMolecular Weight74.44

10. Stability and reactivity

Reactive Hazard Yes

Stability Light sensitive.

Conditions to Avoid Incompatible products. Excess heat. Protect from light.

Incompatible Materials Strong oxidizing agents

Hazardous Decomposition Products Carbon monoxide (CO), Carbon dioxide (CO2), Hydrogen chloride gas, Sodium oxides

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions Corrosive to metals. Contact with acids liberates toxic gas.

11. Toxicological information

Acute Toxicity

Product Information

Oral LD50Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.Dermal LD50Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.Vapor LC50Based on ATE data, the classification criteria are not met. ATE > 20 mg/l.

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Water	-	Not listed	Not listed
Sodium hypochlorite	LD50 = 8200 mg/kg (Rat)	LD50 > 10000 mg/kg(Rabbit)	> 10500 mg/l (Rat) 1h

Toxicologically Synergistic

Products

No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation Causes skin burns; Causes eye burns; Irritating to respiratory system

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Water	7732-18-5	Not listed				
Sodium hypochlorite	7681-52-9	Not listed				

Mutagenic Effects No information available

Reproductive Effects

No information available.

Developmental Effects

No information available.

Teratogenicity

No information available.

STOT - single exposure Respiratory system STOT - repeated exposure None known

Page 5/7



Revision Date 24-January-2018

Aspiration hazard No information available

Symptoms I effects, both acute and Product is a corrosive material. Use of gastric lavage or emesis is contraindicated.

delayed

Possible perforation of stomach or esophagus should be investigated: Ingestion causes

severe swelling, severe damage to the delicate tissue and danger of perforation

Endocrine Disruptor Information No information available

Other Adverse Effects See actual entry in RTECS for complete information.

12. Ecological information

The product contains following substances which are hazardous for the environment.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Sodium hypochlorite	EC50: = 0.095 mg/L, 24h (Skeletonema costatum)	Pimephales promelas: LC50=0.82-0.98 mg/L 96h	. 	2.1 mg/L EC50 = 96 h 0.033-0.044 mg/L EC50 48 h

Persistence and Degradability Soluble in water Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its water solubility.

13. Disposal considerations

Waste Disposal Methods

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT

UN-No UN1791

Proper Shipping Name HYPOCHLORITE SOLUTIONS

Hazard Class III

Packing Group

TDG

UN1791 UN-No

HYPOCHLORITE SOLUTIONS **Proper Shipping Name**

Hazard Class Packing Group III

IATA

UN-No UN1791

Proper Shipping Name HYPOCHLORITE SOLUTION

Hazard Class Packing Group Ш

IMDG/IMO

UN-No UN1791

Proper Shipping Name HYPOCHLORITE SOLUTION

Hazard Class 8 **Packing Group** III

15. Regulatory information

All of the components in the product are on the following Inventory lists: Australia Complete Regulatory Information contained in following SDS's X = listed China Canada The product is classified and labeled according to EC directives or corresponding national laws The product is classified and labeled in accordance with Directive 1999/45/EC TSCA Korea Philippines

International Inventories

Page 6/7



Revision Date 24-January-2018

Component	DSL	NDSL	TSCA	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Water	Х	-	Х	231-791-2	-		Х	-	Х	Х	Х
Sodium hypochlorite	Х	100	Х	231-668-3	121		Х	Х	Х	Х	Х

Canada

SDS in compliance with provisions of information as set out in Canadian Standard - Part 4, Schedule 1 and 2 of the Hazardous Products Regulations (HPR) and meets the requirements of the HPR (Paragraph 13(1)(a) of the Hazardous Products Act (HPA)).

16. Other information

Prepared By Regulatory Affairs

Thermo Fisher Scientific

Email: EMSDS.RA@thermofisher.com

Creation Date25-October-2010Revision Date24-January-2018Print Date24-January-2018

Revision Summary

This document has been updated to comply with the requirements of WHMIS 2015 to align

with the Globally Harmonised System (GHS) for the Classification and Labelling of

Chemicals.

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS



SODIUM BISULFITE



SIGMA-ALDRICH

sigma-aldrich.com

SAFETY DATA SHEET

Version 5.9 Revision Date 05/17/2018 Print Date 07/01/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Sodium bisulfite

Product Number : 243973 Brand : Sigma-Aldrich CAS-No. : 7631-90-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich

3050 Spruce Street SAINT LOUIS MO 63103

USA

Telephone : +1 800-325-5832 Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Acute toxicity, Oral (Category 4), H302 Serious eye damage (Category 1), H318 Acute aquatic toxicity (Category 3), H402

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)

H302 Harmful if swallowed.
H318 Causes serious eye damage.
H402 Harmful to aquatic life.

Precautionary statement(s)

P264 Wash skin thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P273 Avoid release to the environment.
P280 Wear eye protection/ face protection.

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.

Rinse mouth.

P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove

contact lenses, if present and easy to do. Continue rinsing. Immediately

Sigma-Aldrich - 243973 Page 1 of 8

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



call a POISON CENTER/doctor.

P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Synonyms : Sodium hydrogensulfite

Hazardous components

Component		Classification	Concentration
Sodium hydrogensu	lphite		
CAS-No. EC-No. Index-No.	7631-90-5 231-548-0 016-064-00-8	Acute Tox. 4; H302	90 - 100 %
Sodium metabisulph	ite		
CAS-No. EC-No. Index-No.	7681-57-4 231-673-0 016-063-00-2	Acute Tox. 4; Eye Dam. 1; Aquatic Acute 3; H302, H318 H402	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Dry powder

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

Sigma-Aldrich - 243973 Page 2 of 8

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES

5.1 Personal precautions, protective equipment and emergency procedures

Wear respiratory protection. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Do not flush with water. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs. Avoid contact with skin and eyes. Avoid formation of dust and aerosols.

Provide appropriate exhaust ventilation at places where dust is formed.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Never allow product to get in contact with water during storage. Do not store near acids.

Air and moisture sensitive.

Storage class (TRGS 510): 13: Non Combustible Solids

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis	
Sodium hydrogensulphite	7631-90-5	TWA	5 mg/m3	USA. ACGIH Threshold Limit Values (TLV)	
	Remarks	Upper Respiratory Tract irritation Eye irritation Skin irritation Not classifiable as a human carcinogen			
		TWA	5 mg/m3	USA. NIOSH Recommended Exposure Limits	
		PEL	5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)	
Sodium metabisulphite	7681-57-4	TWA	5 mg/m3	USA. ACGIH Threshold Limit Values (TLV)	
		Upper Respiratory Tract irritation Not classifiable as a human carcinogen			

Sigma-Aldrich - 243973 Page 3 of 8



TWA	5 mg/m3	USA. NIOSH Recommended Exposure Limits
PEL	5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 **Exposure controls**

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm Break through time: 480 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact Material: Nitrile rubber

Minimum layer thickness: 0.11 mm Break through time: 480 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method:

EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Form: solid a) Appearance b) Odour No data available c) Odour Threshold No data available d) рΗ No data available

e) Melting point/freezing Melting point/range: 300 °C (572 °F)

point

Sigma-Aldrich - 243973 Page 4 of 8

LA-UR-19-22215 Attachment E



f)	Initial boiling point and boiling range	No data available
9	J)	Flash point	No data available
r	1)	Evaporation rate	No data available
i))	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k	()	Vapour pressure	No data available
ľ)	Vapour density	No data available
r	n)	Relative density	No data available
r	1)	Water solubility	No data available
C)	Partition coefficient: n- octanol/water	No data available
þ)	Auto-ignition temperature	No data available
C	4)	Decomposition temperature	No data available
r)	Viscosity	No data available
9	5)	Explosive properties	No data available
ť)	Oxidizing properties	No data available

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

Strong oxidizing agents, Strong acids

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Sulphur oxides, Sodium oxides Other decomposition products - No data available In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

No data available

Inhalation: No data available Dermal: No data available

No data available

Sigma-Aldrich - 243973 Page 5 of 8



Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as

probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a

known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's

list of regulated carcinogens.

Reproductive toxicity

No data available No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, chest pain

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No data available

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Harmful to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Sigma-Aldrich - 243973 Page 6 of 8

LA-UR-19-22215 Attachment E E-56 of 96



Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Sodium metabisulphite)

Reportable Quantity (RQ): 5000 lbs Poison Inhalation Hazard: No

IMDG

Not dangerous goods

IATA

Not dangerous goods

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Acute Health Hazard

Massachusetts Right To Know Components

Sodium hydrogensulphite Sodium metabisulphite	CAS-No. 7631-90-5 7681-57-4	Revision Date 2007-03-01 2007-03-01
Sodium metabisarphite	7001-37-4	2007-03-01
Pennsylvania Right To Know Components		
Sodium hydrogensulphite Sodium metabisulphite	CAS-No. 7631-90-5 7681-57-4	Revision Date 2007-03-01 2007-03-01
New Jersey Right To Know Components		
Sodium hydrogensulphite Sodium metabisulphite	CAS-No. 7631-90-5 7681-57-4	Revision Date 2007-03-01 2007-03-01

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox. Acute toxicity Acute aquatic toxicity Aquatic Acute Eye Dam. Serious eye damage H302 Harmful if swallowed. Causes serious eye damage. H318 H402 Harmful to aquatic life.

HMIS Rating

Health hazard: 2 Chronic Health Hazard: 0 Flammability: Physical Hazard 0

Page 7 of 8 Sigma-Aldrich - 243973

LA-UR-19-22215 Attachment E E-57 of 96



NFPA Rating

Health hazard: 2
Fire Hazard: 0
Reactivity Hazard: 0

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 5.9 Revision Date: 05/17/2018 Print Date: 07/01/2018

Sigma-Aldrich - 243973 Page 8 of 8



FERRIC CHLORIDE





SAFETY DATA SHEET

1. Identification

Product identifier: - FERRIC CHLORIDE SOLUTION

Other means of identification

000100000108 SDS number:

Recommended use and restriction on use

Recommended use: Reserved for industrial and professional use.

Restrictions on use: Not known.

Manufacturer/Importer/Supplier/Distributor Information

Univar

3075 Highland Pkwy STE 200

Downers Grove, IL 60515

425-889-3400

Emergency telephone number:For emergency assistance Involving chemicals

call CHEMTREC day or night at: 1-800-424-9300. CHEMTREC INTERNATIONAL Tel# 703-527-3887

2. Hazard(s) identification

Hazard Classification

Health Hazards

Acute toxicity (Oral) Category 4

Acute toxicity (Dermal) Category 4

Skin Corrosion/Irritation Category 2

Category 2A Serious Eye Damage/Eye Irritation **Environmental Hazards**Acute Category 2

hazards to the aquatic environment

Label Elements

Hazard Symbol





Signal Word Danger

Hazard Statement Corrosive.

May be corrosive to metals.

Aspiration hazard if swallowed - can enter lungs and cause damage.

Causes skin irritation. Toxic if inhaled. Harmful to aquatic life.

Precautionary Statements

Prevention Wear protective gloves/protective clothing/eye protection/face protection.

Wash thoroughly after handling. Do not eat, drink or smoke when using

this product.

Response IF IN EYES: Rinse cautiously with water for several minutes. Remove

contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. IF ON SKIN: Wash with plenty of water. If skin irritation occurs: Get medical advice/attention. IF SWALLOWED: Call a POISON CENTRE/doctor/ if you feel unwell. Rinse

mouth. Call a POISON CENTRE/doctor/ if you feel unwell. Wash

contaminated clothing before reuse.

Storage Keep container tightly closed.



Disposal Dispose of contents/container to an appropriate treatment and disposal

facility in accordance with applicable laws and regulations, and product

characteristics at time of disposal.

Other hazards which do not result in GHS classification

None.

3. Composition/information on ingredients

Substances

Chemical Identity	Common name and synonyms	CAS number	Content in percent (%)*
Ferric Chloride	, Ferric Chloride	7705-08-0	>=20 - <=50%
Water		7732-18-5	>=50 - <=70%
Hydrochloric acid		7647-01-0	>=0 - <=2%

^{*} All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

Ingestion: Rinse mouth. Do NOT induce vomiting. Get medical attention immediately.

Inhalation: Move to fresh air. If breathing is difficult, give oxygen. Perform artificial

respiration if breathing has stopped.

Skin Contact: Immediately flush with plenty of water for at least 15 minutes while

removing contaminated clothing and shoes.

Eye contact: If in eyes, hold eyes open, flood with water for at least 15 minutes and see

a doctor.

Most important symptoms/effects, acute and delayed Symptoms:

No data available.

Indication of immediate medical attention and special treatment needed

Treatment: No data available.

5. Fire-fighting measures

General Fire Hazards: No data available.

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NRDES Permit Re-Application



Suitable (and unsuitable) extinguishing media

Suitable extinguishing

Use: Water. Carbon dioxide or dry powder. Foam.

media:

Unsuitable extinguishing No data available.

media:

Specific hazards arising from the No data available.

chemical:

Special protective equipment and precautions for firefighters

Special fire fighting No data available.

procedures:

Special protective equipment for No data available.

fire-fighters:

6. Accidental release measures

Personal precautions, protective

equipment and emergency

procedures:

Methods and material for Absorb spillage with non-combustible, absorbent material. Dike for later

containment and cleaning up: disposal. Prevent runoff from entering drains, sewers, or streams.

7. Handling and storage

Precautions for safe handling: Use personal protective equipment as required. Use only with adequate

ventilation. Avoid breathing mists or vapors. Store away from

incompatible materials.

Conditions for safe storage,

including any incompatibilities:

No data available.

No data available.

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



8. Exposure controls/personal protection

Control Parameters

Occupational Exposure Limits

Chemical Identity	Туре	Exposure Limit Value	es	Source
Ferric Chloride - as Fe	TWA	1 mg/	m3	US. ACGIH Threshold Limit Values (03
				2013)
	REL	1 mg/	m3	US. NIOSH: Pocket Guide to Chemical
				Hazards (2010)
	TWA	1 mg/	m3	US. OSHA Table Z-1-A (29 CFR
				1910.1000) (1989)
	TWA	1 mg/	m3	US. Tennessee. OELs. Occupational
				Exposure Limits, Table Z1A (06 2008)
Ferric Chloride -	AN ESL	1 μg/	m3	US. Texas. Effects Screening Levels
Particulate.				(Texas Commission on Environmental
				Quality) (02 2013)
	ST ESL	10 μg/	m3	US. Texas. Effects Screening Levels
				(Texas Commission on Environmental
				Quality) (02 2013)
Ferric Chloride - as Fe	TWA PEL	1 mg/	m3	US. California Code of Regulations,
				Title 8, Section 5155. Airborne
				Contaminants (02 2012)
Hydrochloric acid	Ceiling	5 ppm 7 mg/	m3	US. Tennessee. OELs. Occupational
				Exposure Limits, Table Z1A (06 2008)
	AN ESL	8.4 μg/	m3	US. Texas. Effects Screening Levels
				(Texas Commission on Environmental
				Quality) (02 2013)
	ST ESL		190	US. Texas. Effects Screening Levels
		μg/	m3	(Texas Commission on Environmental
				Quality) (02 2013)
	AN ESL	5.7	opb	US. Texas. Effects Screening Levels
				(Texas Commission on Environmental
				Quality) (02 2013)
	ST ESL	130	opb	US. Texas. Effects Screening Levels
				(Texas Commission on Environmental
				Quality) (02 2013)
	Ceiling	5 ppm 7 mg/	m3	US. California Code of Regulations,
				Title 8, Section 5155. Airborne



				Contaminants (02 2012)
	Ceiling	2 ppm	Î	US. ACGIH Threshold Limit Values (03
		57 57		2013)
1	Ceil_Tim	5 ppm	7 mg/m3	US. NIOSH: Pocket Guide to Chemical
	e			Hazards (2010)
	Ceiling	5 ppm	7 mg/m3	US. OSHA Table Z-1 Limits for Air
	****		200-117	Contaminants (29 CFR 1910.1000)
				(02 2006)
9	Ceiling	5 ppm	7 mg/m3	US. OSHA Table Z-1-A (29 CFR
				1910.1000) (1989)

Appropriate Engineering

No data available.

Controls

Individual protection measures, such as personal protective equipment

General information: No data available. Eye/face protection: No data available.

Skin Protection

Hand Protection: No data available. Other: No data available. **Respiratory Protection:** No data available. No data available. Hygiene measures:

9. Physical and chemical properties

Physical state: liquid

Form: No data available.

Dark brown Color: Odor: Mild sour/acidic Odor threshold: No data available.

pH: < 2 10 °F Melting point/freezing point:

Initial boiling point and boiling range: 100 - 110 °C Flash Point: not applicable

Evaporation rate: < 1

Flammability (solid, gas): No data available.

Upper/lower limit on flammability or explosive limits

Flammability limit - upper (%): No data available. Flammability limit - lower (%): No data available.

LA-UR-19-22215 Attachment E E-65 of 96



Explosive limit - upper (%):

Explosive limit - lower (%):

Vapor pressure:

Vapor density:

Relative density:

No data available.

No data available.

No data available.

No data available.

Solubility(ies)

Solubility in water: (20 °C) Completely Soluble

Solubility (other):

Partition coefficient (n-octanol/water):

Auto-ignition temperature:

Decomposition temperature:

Viscosity:

No data available.

No data available.

No data available.

10. Stability and reactivity

Reactivity: No data available.
Chemical Stability: No data available.
Possibility of hazardous No data available.

reactions:

Conditions to avoid:No data available.Incompatible Materials:No data available.Hazardous DecompositionNo data available.

Products:

11. Toxicological information

Symptoms related to the physical, chemical and toxicological characteristics

Ingestion:No data available.Inhalation:No data available.Skin Contact:No data available.Eye contact:No data available.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral

Product: ATEmix (): 454.945055 mg/kg

Dermal

Product: ATEmix (): 1,983.602411 mg/kg

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



Inhalation

Product: No data available.

Specified substance(s):

LC 50 (Rat,): 8.3 mg/l (, No) 2 = reliable with restrictions LC 50 (Rat,): 45.6Hydrochloric acid

mg/I (, No) 2 = reliable with restrictions

Repeated dose toxicity

Product: No data available.

Skin Corrosion/Irritation

Product: No data available.

Serious Eye Damage/Eye Irritation

Product: No data available.

Respiratory or Skin Sensitization

Product: No data available.

Carcinogenicity

Product: No data available.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:

No carcinogenic components identified

US. National Toxicology Program (NTP) Report on Carcinogens:

No carcinogenic components identified

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):

No carcinogenic components identified

Germ Cell Mutagenicity

In vitro

No data available. Product:

In vivo

No data available. Product:

Reproductive toxicity

Product: No data available. Specific Target Organ Toxicity - Single Exposure **Product:** No data available. Specific Target Organ Toxicity - Repeated Exposure Product: No data available.

Aspiration Hazard

Product: No data available. Other effects: No data available.

LA-UR-19-22215 Attachment E



12. Ecological information

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish

Product: No data available.

Specified substance(s):

Ferric Chloride LC 50 (Western mosquitofish (Gambusia affinis), 24 h): 26 mg/l Mortality LC

> 50 (Guppy (Poecilia reticulata), 48 h): 117.18 mg/l Mortality LC 50 (Western mosquitofish (Gambusia affinis), 48 h): 26 mg/l Mortality LC 50 (Bluegill (Lepomis macrochirus), 96 h): 20.26 mg/l Mortality LC 50 (Fathead minnow

(Pimephales promelas), 96 h): 20.95 - 22.56 mg/I Mortality

Hydrochloric acid LC 50 (Western mosquitofish (Gambusia affinis), 48 h): 282 mg/l Mortality

> LC 50 (Western mosquitofish (Gambusia affinis), 96 h): 282 mg/l Mortality LC 50 (Western mosquitofish (Gambusia affinis), 24 h): 282 mg/l Mortality

Aquatic Invertebrates

Product: No data available.

Specified substance(s):

Ferric Chloride EC 50 (Water flea (Daphnia magna), 21 d): 5.18 - 6.73 mg/l Intoxication EC

50 (Tubificid worm (Tubifex tubifex), 24 h): 102.5 - 123.68 mg/l Intoxication

EC 50 (Tubificid worm (Tubifex tubifex), 48 h): 91.83 - 111.57 mg/l Intoxication EC 50 (Amphipod (Crangonyx pseudogracilis), 48 h): 139 - 184

mg/l Intoxication EC 50 (Water flea (Daphnia magna), 48 h): 9.6 mg/l

Intoxication

Hydrochloric acid LC 50 (Green or European shore crab (Carcinus maenas), 48 h): 240 mg/l

Mortality LC 50 (Common shrimp, sand shrimp (Crangon crangon), 48 h):

260 mg/l Mortality

Chronic hazards to the aquatic environment:

Fish

Product: No data available.

Aquatic Invertebrates

Product: No data available.

Toxicity to Aquatic Plants

Product: No data available.

Persistence and Degradability

Biodegradation

Product: No data available.

BOD/COD Ratio

LA-UR-19-22215 Attachment E



Product: No data available.

Bioaccumulative potential

Bioconcentration Factor (BCF)

Product: No data available.

Specified substance(s):

Ferric Chloride Plaice, sand dab (Pleuronectes platessa), Bioconcentration Factor (BCF): 8

(Not reported)

Plaice, sand dab (Pleuronectes platessa), Bioconcentration Factor (BCF):

7,400 (Not reported)

Plaice, sand dab (Pleuronectes platessa), Bioconcentration Factor (BCF): 600

(Not reported)

Plaice, sand dab (Pleuronectes platessa), Bioconcentration Factor (BCF):

56,400 (Not reported)

Plaice, sand dab (Pleuronectes platessa), Bioconcentration Factor (BCF):

5,600 (Not reported)

Partition Coefficient n-octanol / water (log Kow) **Product:** No data available. Mobility in soil: No data available.

Known or predicted distribution to environmental compartments

Iron trichloride No data available. Water No data available. Hydrogen chloride No data available.

Known or predicted distribution to environmental compartments

Iron trichloride No data available. Hydrogen chloride No data available.

13. Disposal considerations

Disposal instructions: Discharge, treatment, or disposal may be subject to national, state, or local

Contaminated Packaging: Since emptied containers retain product residue, follow label warnings

even after container is emptied.

LA-UR-19-22215 Attachment E E-69 of 96



14. Transport information

DOT

UN Number: UN 2582

UN Proper Shipping Name: Ferric chloride solution

Transport Hazard Class(es)

8 Class: Label(s): 8 Packing Group: Ш

Marine Pollutant: Not regulated.

Special precautions for user:

IMDG

UN 2582 **UN Number:**

UN Proper Shipping Name: FERRIC CHLORIDE SOLUTION

Transport Hazard Class(es)

8 Class: Label(s): 8 EmS No.: F-A, S-B Packing Group:

Marine Pollutant: Not regulated.

Special precautions for user:

IATA

UN 2582 **UN Number:**

Proper Shipping Name: Ferric chloride solution

Transport Hazard Class(es):

Class: 8 Label(s): 8 Packing Group:

Not regulated. **Environmental Hazards**

Special precautions for user:

Other information

Passenger and cargo aircraft: Allowed. Cargo aircraft only: Allowed.

15. Regulatory information

LA-UR-19-22215 Attachment E E-70 of 96



US Federal Regulations US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):

Ferric Chloride Reportable quantity: 1000 lbs. Hydrochloric acid Reportable quantity: 5000 lbs. Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Not listed.

SARA 302 Extremely Hazardous Substance

Chemical Identity	RQ	Threshold Planning Quantity
Hydrochloric acid	5000 lbs.	500 lbs.

SARA 304 Emergency Release Notification

Chemical Identity	RQ
Ferric Chloride	1000 lbs.
Hydrochloric acid	5000 lbs.

SARA 311/312 Hazardous Chemical

Chemical Identity	Inreshold Planning Quantity
Hydrochloric acid	500lbs
Ferric Chloride	500 lbs

SARA 313 (TRI Reporting)

Chemical Identity

Reporting

Reporting threshold for threshold for other users manufacturing and processing

Hydrochloric acid 10000 lbs 25000 lbs. Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)

Ferric Chloride Reportable quantity: 1000 lbs. Hydrochloric acid Reportable quantity: 5000 lbs.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):

Hydrochloric acid Threshold quantity: 15000 lbs Hydrochloric acid Threshold quantity: 5000 lbs

US State Regulations

US. California Proposition 65

No ingredient regulated by CA Prop 65 present.

LA-UR-19-22215 Attachment E E-71 of 96



US. New Jersey Worker and Community Right-to-Know Act

Ferric Chloride Listed
US. Massachusetts RTK - Substance List
Ferric Chloride Listed
Hydrochloric acid Listed

US. Pennsylvania RTK - Hazardous Substances

Ferric Chloride Listed

US. Rhode Island RTK

Ferric Chloride Listed



Inventory Status: Australia AICS: Not in compliance with the inventory. Canada DSL Inventory List: Not in compliance with the inventory. **EU EINECS List:** On or in compliance with the inventory **EU ELINCS List:** Not in compliance with the inventory. Japan (ENCS) List: Not in compliance with the inventory. **EU No Longer Polymers List:** Not in compliance with the inventory. China Inv. Existing Chemical Substances: Not in compliance with the inventory. Korea Existing Chemicals Inv. (KECI): Not in compliance with the inventory. Canada NDSL Inventory: Not in compliance with the inventory. Philippines PICCS: Not in compliance with the inventory. **US TSCA Inventory:** On or in compliance with the inventory New Zealand Inventory of Chemicals: Not in compliance with the inventory. Not in compliance with the inventory. Japan ISHL Listing: Japan Pharmacopoeia Listing: Not in compliance with the inventory.

16.Other information, including date of preparation or last revision

HMIS Hazard ID



B - Safety Glasses & Gloves

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe; RNP - Rating not possible; *Chronic health effect

NFPA Hazard ID



Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe; RNP - Rating not possible

Issue Date: 12/12/2017 **Revision Date:** No data available.

Version #: 1.0

Further Information: No data available.

LA-UR-19-22215 Attachment E



Univar USA Inc Safety Data Sheet

For Additional Information contact SDS Coordinator during business hours, Pacific time: (425) 889-3400

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Do not use ingredient information and/or ingredient percentages in this SDS as a product specification. For product specification information refer to a product specification sheet and/or a certificate of analysis. These can be obtained from your local Univar sales office.

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate, Univar makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Univar's control and therefore users are responsible to verify this data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product, or from the publication or use of, or reliance upon, information contained herein.

This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process



NALCO PERMA TREAT PC-510T





SAFETY DATA SHEET

PermaTreat® PC-510T

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

PermaTreat® PC-510T Product name

Other means of identification Not applicable.

Recommended use REVERSE OSMOSIS ANTISCALANT

Restrictions on use Refer to available product literature or ask your local Sales

Representative for restrictions on use and dose limits.

Nalco Company Company

1601 W. Diehl Road Naperville, Illinois 60563-1198

USA

TEL: (630)305-1000

Emergency telephone

number

(800) 424-9300 (24 Hours) CHEMTREC

09/11/2014 Issuing date

Section: 2. HAZARDS IDENTIFICATION

GHS Classification

Not a hazardous substance or mixture.

GHS Label element

Precautionary Statements Prevention:

> Wash hands thoroughly after handling. Response:

Specific measures: consult MSDS Section 4.

Storage:

Store in accordance with local regulations.

Other hazards : None known.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

No hazardous ingredients

Section: 4. FIRST AID MEASURES

: Rinse with plenty of water. Get medical attention if symptoms occur. In case of eye contact

In case of skin contact Wash off with soap and plenty of water. Get medical attention if

symptoms occur.

If swallowed : Rinse mouth. Get medical attention if symptoms occur.

If inhaled Get medical attention if symptoms occur.

Protection of first-aiders In event of emergency assess the danger before taking action. Do

> not put yourself at risk of injury. If in doubt, contact emergency responders. Use personal protective equipment as required.

> > 1/8



PermaTreat® PC-510T

Notes to physician : No specific measures identified

See toxicological information (Section 11)

Section: 5. FIREFIGHTING MEASURES

Suitable extinguishing media

: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing

media

: None known.

Specific hazards during

firefighting

: Not flammable or combustible.

Hazardous combustion

products

: Carbon oxides Oxides of phosphorus

Special protective equipment

for firefighters

: Use personal protective equipment.

Specific extinguishing

methods

: Fire residues and contaminated fire extinguishing water must

be disposed of in accordance with local regulations.

Section: 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Refer to protective measures listed in sections 7 and 8.

Environmental precautions : No special environmental precautions required.

Methods and materials for containment and cleaning up

: Stop leak if safe to do so. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth,

diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Flush away traces with water. For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway.

Section: 7. HANDLING AND STORAGE

Advice on safe handling : For personal protection see section 8. Wash hands after handling.

Conditions for safe storage : Keep out of reach of children. Keep container tightly closed. Store in

suitable labeled containers.

Suitable material : Keep in properly labelled containers.

Unsuitable material : The following compatibility data is suggested based on similar

product data and/or industry experience: Shipping and long term storage compatibility with construction materials can vary; we therefore recommend that compatibility is tested prior to use.

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters



PermaTreat® PC-510T

Contains no substances with occupational exposure limit values.

Engineering measures : Use local exhaust ventilation if necessary to control airborne mist

and vapor.

Good general ventilation should be sufficient to control worker

exposure to airborne contaminants.

Personal protective equipment

Eye protection : Safety glasses

Hand protection : Wear protective gloves.

Gloves should be discarded and replaced if there is any indication of

degradation or chemical breakthrough.

Skin protection : Wear suitable protective clothing.

Respiratory protection : No personal respiratory protective equipment normally required.

Hygiene measures : Wash hands before breaks and immediately after handling the

product.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid
Colour : dark amber
Odour : Slight
Flash point : > 93.3 °C

Method: closed cup

pH : 9.5, 100 %

Odour Threshold : no data available
Melting point/freezing point : no data available
Initial boiling point and boiling : no data available

range

Evaporation rate : no data available

Flammability (solid, gas) : no data available
Upper explosion limit : no data available
Lower explosion limit : no data available
Vapour pressure : no data available
Relative vapour density : no data available
Relative density : 1.225 (25 °C)
Density : 10.2 lb/gal

Water solubility : completely soluble
Solubility in other solvents : no data available
Partition coefficient: n- : no data available

octanol/water



PermaTreat® PC-510T

Auto-ignition temperature : no data available

Thermal decomposition : Carbon oxides Oxides of phosphorus

Viscosity, dynamic : no data available
Viscosity, kinematic : no data available
VOC : no data available

Section: 10. STABILITY AND REACTIVITY

Chemical stability : Stable under normal conditions.

Possibility of hazardous

reactions

: No dangerous reaction known under conditions of normal use.

Conditions to avoid : None known.

Incompatible materials : Contact with strong oxidizers (e.g. chlorine, peroxides, chromates,

nitric acid, perchlorate, concentrated oxygen, permanganate) may

generate heat, fires, explosions and/or toxic vapors.

Hazardous decomposition

products

Oxides of carbon
 Oxides of phosphorus

Section: 11. TOXICOLOGICAL INFORMATION

Information on likely routes of

exposure

: Inhalation, Eye contact, Skin contact

Potential Health Effects

Eyes : Health injuries are not known or expected under normal use.

Skin : Health injuries are not known or expected under normal use.

Ingestion : Health injuries are not known or expected under normal use.

Inhalation : Health injuries are not known or expected under normal use.

Chronic Exposure : Health injuries are not known or expected under normal use.

Experience with human exposure

Eye contact : No symptoms known or expected.

Skin contact : No symptoms known or expected.

Ingestion : No symptoms known or expected.

Inhalation : No symptoms known or expected.

Toxicity

Product

Acute oral toxicity : no data available

Acute inhalation toxicity : no data available



PermaTreat® PC-510T

Acute dermal toxicity : no data available

Skin corrosion/irritation : no data available

Serious eye damage/eye

irritation

: no data available

Respiratory or skin

sensitization

: no data available

Carcinogenicity : no data available

Reproductive effects : no data available

Germ cell mutagenicity : no data available

Teratogenicity : no data available

STOT - single exposure : no data available

STOT - repeated exposure : no data available

Aspiration toxicity : no data available

Section: 12. ECOLOGICAL INFORMATION

Ecotoxicity

Environmental Effects : This product has no known ecotoxicological effects.

Product

Toxicity to fish : no data available

Toxicity to daphnia and other

aquatic invertebrates

: no data available

Toxicity to algae : no data available

Persistence and degradability

Chemical Oxygen Demand (COD): 280,000 mg/l

Mobility

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models. If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

5/8

Air : <5% Water : 10 - 30% Soil : 70 - 90%



PermaTreat® PC-510T

The portion in water is expected to be soluble or dispersible.

Bioaccumulative potential

no data available

Other information

no data available

Section: 13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it is not a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

Disposal methods

: Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in an

approved waste disposal facility.

Disposal considerations

 Dispose of as unused product. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

Section: 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

Land transport (DOT)

Proper shipping name

PRODUCT IS NOT REGULATED DURING

TRANSPORTATION

Air transport (IATA)

Proper shipping name

: PRODUCT IS NOT REGULATED DURING

TRANSPORTATION

Sea transport (IMDG/IMO)

Proper shipping name

: PRODUCT IS NOT REGULATED DURING

TRANSPORTATION

Section: 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : No SARA Hazards



PermaTreat® PC-510T

SARA 302 : No chemicals in this material are subject to the reporting requirements

of SARA Title III, Section 302.

SARA 313 : This material does not contain any chemical components with known

CAS numbers that exceed the threshold (De Minimis) reporting levels

established by SARA Title III, Section 313.

California Prop 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

INTERNATIONAL CHEMICAL CONTROL LAWS:

TOXIC SUBSTANCES CONTROL ACT (TSCA)

The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA)

The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

AUSTRALIA

All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

CHINA

All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on or exempt from the Inventory of Existing Chemical Substances China (IECSC).

EUROPE

The substance(s) in this preparation are included in or exempted from the EINECS or ELINCS inventories

JAPAN

All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

KOREA

All substances in this product comply with the Toxic Chemical Control Law (TCCL) and are listed on the Existing Chemicals List (ECL)

NEW ZEALAND

All substances in this product comply with the Hazardous Substances and New Organisms (HSNO) Act 1996, and are listed on or are exempt from the New Zealand Inventory of Chemicals.

PHILIPPINES

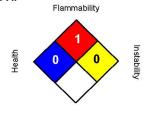
All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

Section: 16. OTHER INFORMATION



PermaTreat® PC-510T

NFPA:



Special hazard.

HMIS III:



0 = not significant, 1 = Slight, 2 = Moderate, 3 = High 4 = Extreme, * = Chronic

Revision Date : 09/11/2014

Version Number : 1.0

Prepared By : Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

For additional copies of an MSDS visit www.nalco.com and request access.



BRIGHT DYES FLT YELLOW/GREEN LIQUID





Safety Data Sheet

Issue Date: 04-Oct-2013 Revision Date: 06-Feb-2017 Version Number: 1.1

1. Identification

Product Identifiers

Product Name: Bright Dyes® FLT Yellow/Green Liquid

Product Number: 106001

Recommended Use & Restrictions on Use

Water tracing & leak detection dye

Manufacturer/Supplier

Kingscote Chemicals, Inc. 3334 South Tech Blvd. Miamisburg, OH 45342

U.S.A.

Emergency Telephone Number

Company Telephone Number: (937) 886-9100

Emergency Telephone (24 hr): INFOTRAC (800) 535-5053 (North America)

+1-352-323-3500 (International)

2. Hazards Identification

Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least

15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs:

Get medical advice/attention.

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek

medical attention immediately.

Page **1** of **6**



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give

anything by mouth to an unconscious person. Get medical attention if large

quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation.

Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the

system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media

Water spray (fog). Carbon dioxide (CO2). Dry chemical. Regular foam.

Unsuitable Extinguishing Media

Not determined

Specific Hazards Arising from the Chemical

Product is not flammable. Burning/combustion may produce oxides of carbon and nitrogen (NOx).

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or

groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area

with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices.

Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing

should be thoroughly washed before reuse.

Page 2 of 6



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry, and well-

ventilated area. Keep from freezing.

Incompatible Materials Acids.

8. Exposure Controls / Personal Protection

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection Goggles.

Skin & Body Protection Rubber gloves. Suitable protective clothing.

Respiratory Protection No protection is ordinarily required under normal conditions of use.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practices.

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

 Physical State
 Liquid
 Odor
 None apparent

 Appearance
 Yellow/green liquid
 Odor Threshold
 Not determined

 Color
 Yellow/green

PropertyValuespH>8.0Melting/Freezing Point~32° FBoiling Point/Range~212° FFlash PointNot applicable

Evaporation Rate 1.8

Flammability (solid, gas)
Upper Flammability Limits
Lower Flammability Limits
Vapor Pressure
Vapor Density
Relative Density
Liquid – not applicable
Not applicable
Not applicable
0.6
Not applicable

Relative Density
Specific Gravity
Not determined
Solubility
Highly soluble in water
Partition Coefficient
Auto-ignition Temperature
Decomposition Temperature
Viscosity
Not determined
Not determined
Not determined
Not determined

Page 3 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Liquid

10. Stability and Reactivity

Reactivity

Not reactive under normal conditions.

Chemical Stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials

Acids. Strong oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation Avoid breathing vapors or mists.

Ingestion Do not ingest.

Skin Contact May cause an allergic skin reaction.

Eye Contact Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure

May cause an allergic skin reaction.

Numerical Measures of Toxicity

Not determined

Symptoms Associated with Exposure

See Section 4 of this SDS for symptoms.

Carcinogenicity

NTP None

IARC None

OSHA None

Page 4 of 6



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

12. Ecological Information

Ecotoxicity

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Not available

Persistence/Degradability

Not determined

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. Disposal Considerations

Waste Disposal Methods

Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

Note

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

OMDG Not regulated

15: Regulatory Information

International Inventories

TASCA This product is not subject to TSCA 12(b) reporting requirements.

U.S. Federal Regulations

CERCLA This material, as supplied, does not contain any substances regulated as

hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Page 5 of 6



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization

Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of

Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants

pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable

state right-to-know regulations.

16: Other Information

HMIS Health Hazards	Flammability O	Instability O	Special Hazards Not determined
NFPA Health Hazards 1	Flammability 0	Physical Hazards O	Personal Protection B
Issue Date	04-Oct-2013		
Revision Date	06-Feb-2017		
Revision Note	Content Review		

<u>Disclaimer</u>

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Page 6 of 6



BRIGHT DYES FLT YELLOW/GREEN TABLETS





Safety Data Sheet

Issue Date: 09-Nov-2013 Revision Date: 06-Feb-2017 Version Number: 2.1

1. Identification

Product Identifiers

Product Name: Bright Dyes® FLT Yellow/Green Tablet

Product Number: 101101

Recommended Use & Restrictions on Use

Water tracing & leak detection dye

Manufacturer/Supplier

Kingscote Chemicals, Inc. 3334 South Tech Blvd. Miamisburg, OH 45342 U.S.A.

Emergency Telephone Number

Company Telephone Number: (937) 886-9100

Emergency Telephone (24 hr): INFOTRAC (800) 535-5053 (North America)

+1-352-323-3500 (International)

2. Hazards Identification

Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least

15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs:

Get medical advice/attention.

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek

medical attention immediately.

Page 1 of 6



Bright Dyes® FLT Yellow/Green Tablet

Revision Date: 06-Feb-2017

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give

anything by mouth to an unconscious person. Get medical attention if large

quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation.

Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the

system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media

Water spray (fog). Carbon dioxide (CO2). Dry chemical.

Unsuitable Extinguishing Media

Not determined

Specific Hazards Arising from the Chemical

Remote possibility of dust explosion. Burning may produce oxides of carbon and nitrogen (NOx).

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or

groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area

with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices.

Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing

should not be allowed out of the workplace.

Page 2 of 6



Bright Dyes® FLT Yellow/Green Tablet

Revision Date: 06-Feb-2017

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry, and well-

ventilated area. Store away from heat, sparks, open flame or any other

ignition source.

Incompatible Materials Bromine trifluoride. Lithium. Strong acids, bases, and oxidizing agents.

8. Exposure Controls / Personal Protection

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection Avoid contact with eyes.

Skin & Body Protection Rubber gloves. Suitable protective clothing.

 $\textbf{Respiratory Protection} \qquad \text{Use NIOSH-approved dust mask if dusty conditions exist.}$

Hygiene Measures Handle in accordance with good industrial hygiene and safety practices.

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

Physical StateSolidOdorNone apparentAppearanceOrange tabletOdor ThresholdNot determined

Color Orange

Property Values рΗ Not applicable Melting/Freezing Point Not applicable **Boiling Point/Range** Not applicable Flash Point Not applicable Not applicable **Evaporation Rate** Flammability (solid, gas) Not flammable **Upper Flammability Limits** Not applicable **Lower Flammability Limits** Not applicable **Vapor Pressure** Not applicable Vapor Density Not applicable **Relative Density** Not applicable **Specific Gravity** Not applicable

Solubility Highly soluble in water with small amounts of insoluble residue

Partition Coefficient
Auto-ignition Temperature
Decomposition Temperature
Viscosity

Not determined
Not determined
Not determined

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Tablet

10. Stability and Reactivity

Reactivity

Not reactive under normal conditions.

Chemical Stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials

Bromine trifluoride. Lithium. Strong acids, bases, and oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation Avoid inhalation of dust.

Ingestion Do not ingest.

Skin Contact May cause an allergic skin reaction.

Eye Contact Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure

May cause an allergic skin reaction.

Numerical Measures of Toxicity

Not determined

Symptoms Associated with Exposure

See Section 4 of this SDS for symptoms.

Carcinogenicity

NTP None

IARC None

OSHA None

Page 4 of 6



Bright Dyes® FLT Yellow/Green Tablet

Revision Date: 06-Feb-2017

12. Ecological Information

Ecotoxicity

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Not available

Persistence/Degradability

This product is biodegradable.

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. Disposal Considerations

Waste Disposal Methods

Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

<u>Note</u>

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

OMDG Not regulated

15: Regulatory Information

International Inventories

Not determined

U.S. Federal Regulations

CERCLA This material, as supplied, does not contain any substances regulated as

hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Page 5 of 6



Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application Outfall 03A027 Fact Sheet

Utilities and Infrastructure (U&I)
Strategic Computing Complex (SCC) Cooling Towers





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Table of Contents

1.0	OUTFALL LOCATION [Section I]	5
2.0	FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]	
2.1	Process Schematic and Water Balance [II.A]	5
2.2	Water Treatment Processes [II.B]	5
2.3	Discharge Rate and Frequency [II.C]	7
3.0	PRODUCTION [Section III]	7
4.0	IMPROVEMENTS [Section IV]	8
5.0	INTAKE AND EFFLUENT CHARACTERISTICS [Section V]	8
5.1	Analytical Data [V.A, B, and C]	8
5.2	Potential Pollutants [V.D]	8
6.0	POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]	10
7.0	BIOLOGICAL TOXICITY TESTING DATA [Section VII]	10
8.0	CONTRACT ANALYSIS INFORMATION [Section VIII]	10
^TT^	CHMENT A: Location Map for Outfall 03A027	۸ 1
	CHMENT B: Process Schematics and Water Balances for Outfall 03A027	
ATTAC	CHMENT C: Photographs	
ATTAC	CHMENT D: Summary Discharge Monitoring Report October 2014 – September 2018	D-1
ΔΤΤΔ	CHMENT F: Safety Data Sheets	F-1

List of Tables

- 1 Sources for Discharges to Outfall 03A027
- 2 Wastewater Treatment Codes Assigned to Outfall 03A027
- 3 List of Treatment Chemicals used in the Operations that Contribute to Outfall 03A027
- 4 Flow Rates and Frequencies for Discharges to Outfall 03A027
- 5 Potential Future Flow Rates and Frequencies for Outfall 03A027
- 6 Potential Pollutants by Source for Outfall 03A027
- 7 List of Independent Laboratories Used for NPDES Water Analysis



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2019 NPDES PERMIT RE-APPLICATION Outfall 03A027 Fact Sheet

1.0 OUTFALL LOCATION [Section I]

Outfall ID No.:	03A027	Outfall Location:	Technical Area 3
Category:	03A, Treated Cooling Water	Originating Structure for the	TA-3-2327, Strategic Computing
	Discharges	Discharge:	Center (SCC)
Flow Type:	Intermittent	Receiving Stream:	Perennial Reach of Sandia Canyon, Water Quality Segment 20.6.4.126
			NMAC
Longitude:	106° 19' 09" W	Latitude:	35° 52' 26" N

2.0 FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]

Outfall 03A027 is located at TA-3 and discharges to a perennial reach of Sandia Canyon in Water Quality Segment 20.6.4.126 NMAC. The outfall is capable of discharging treated cooling water that originates from the Strategic Computing Complex (SCC) at TA-3-2327. Attachment A provides a location map. The cooling tower blow-down is comprised of potable water and/or recycled Sanitary Wastewater System (SWWS) effluent from the Sanitary Effluent Reclamation Facility (SERF) that is treated by the cooling tower water treatment system. Table 1 identifies the discharge source, the source location, and source composition.

	Table 1				
			Sources for D	ischarges to Οι	ıtfall 03A027
TA	Building	Source	Transportation Mode	Discharge	Source
		Type	(Piping, Truck etc.)	Source	Composition
3	2327	Cooling	Piping	SCC Cooling	Treated Cooling Tower Blowdown
				Towers	Potable Water Used as Makeup Water
					SERF Effluent Used as Makeup Water
					 SERF Treatment Chemicals
					 SWWS Treatment Chemicals and
					Chemicals identified on Influent Waste
					Stream Profile Forms

SCC = Strategic Computing Complex; SERF = Sanitary Effluent Reclamation Facility; SWWS = Sanitary Wastewater System

2.1 Process Schematic and Water Balance [II.A]

A process schematic line drawing that shows the outfall sources and route taken by water is provided in Attachment B. This drawing includes all operations that contribute treated cooling water to the discharge at Outfall 03A027. A water balance is also provided on the process schematic with average flows. The water balance is based upon data collected from operations personnel.

2.2 Water Treatment Processes [II.B]

The SCC currently has ten cooling towers that provide cooling water to the chillers and heat exchangers to support cooling of computers, equipment, and the building office areas. Makeup water is fed to the tower basins, circulated through the facility chillers and heat exchangers, and routed back to the cooling towers approximately 2-3 times before it is blown down and recharged with fresh makeup water. The cooling towers are maintained by two identical water treatment systems that draw a small amount of water from the basin discharge line (for circulation and/or blowdown) into a process logic controller and monitoring system to determine conductivity and chlorine content. This system determines the amount water treatment chemicals and makeup water added to the tower basins. It also determines the amount and rate of blowdown from the tower. Table 2 identifies the wastewater treatment codes associated with the water treatment system. Attachment C provides photographs of the outfall, cooling towers, and the wastewater treatment equipment.



Table 2 Wastewater Treatment Codes Assigned to Outfall 03A027			
Source Treatment Description Justification			
SCC Cooling Towers	2-E	Dechlorination	Chlorine Scavenger Chemicals are Added
	2-H	Disinfection (other)	Chemicals are added to Control Microorganisms
	2-L	Reduction	Chemicals that are Antiscalant and Corrosion Inhibitors are Added

SCC = Strategic Computing Complex;

The water treatment processes identified in Table 2 utilize chemicals to monitor the water quality in the cooling tower, control corrosion, limit biological growth, and de-chlorinate blowdown prior to discharge. Table 3 provides a list of the chemicals used to treat the water.

Table 3 List of Treatment Chemicals used in the Operations that Contribute to Outfall 03A027				
Source	Chemical Name	Reason for Use	Toxic Pollutant and/or Haz Substances Table 2C-3 or	
SCC Cooling Towers	Bromine Tablets	Biocide	Bromo-chloro-5,5-dimethyl hydantoin (chlorine source)	2C-4
	HACH 203832	Sulfuric Acid Solution 19.2N	Sulfuric Acid	2C-4
	HACH 1407028	Free Chorine Reagent	Sodium Phosphate Dibasic	2C-4
			EDTA	2C-4
	HACH 2076053	Molybdovanadate Reagent	Sulfuric Acid	2C-4
	HACH 2105669	Total Chlorine Reagent	Sodium Phosphate Dibasic	2C-4
	HACH 2263411	Total Chlorine Indicator	Sulfuric Acid	2C-4
	HACH 2263511	Total Chlorine Buffer Solution	Sodium Hydroxide	2C-4
			EDTA	2C-4
	HACH 2297255	Compound for Free and Total Chlorine Analyzers	NA	NA
	HACH 2314011	Free Chlorine Indicator Solution for CL-17 Analyzer	Toluene	2C-4
	HACH 2314111	Free Chlorine Buffer for CL-117 Analyzer	NA	NA
	HACH 2756549	pH Storage Solution	Sodium Phosphate Dibasic	2C-4
	WEST C-358P	Corrosion Inhibitor & Antiscalant	Potassium Hydroxide	2C-4
	WEST C-825	pH control (neutralization)	Sodium Bisulfite	2C-4
	WEST R-630	Dechlorination	Sodium Bisulfite	2C-4
	Bright Dyes FLT Yellow/Green Liquid	Water Line & Drain Tracing Dye	NA	NA
	Bright Dyes FLT Yellow/Green Tablet	Water Line & Drain Tracing Dye	NA	NA
SERF Treatment	40% Ferric Chloride	Promote Precipitation	Ferric Chloride	2C-4
Chemicals ^a	25% Magnesium Chloride	Promote Precipitation	Magnesium Chloride	NA
	33% Hydrochloric Acid	pH Adjustment	Hydrochloric Acid	2C-4
	35% Sodium Hypochlorite	Clean/Disinfect RO Units	Sodium Hypochlorite	2C-4
	25% Sodium Hydroxide	pH Adjustment	Sodium Hydroxide	2C-4
	38% Sodium Bisulfite	Injected prior to the RO Unit as a de-chlorinating Agent.	Sodium Bisulfite	2C-4
	Perma Treat PC- 510T	RO Unit Antiscalant Polymer	Sodium Nitrite	2C-4



Table 3					
	List of Treatment Chemicals used in the Operations that Contribute to Outfall 03A027				
Source	Chemical Name	Reason for Use	Toxic Pollutant and/or Hazardous Substances Table 2C-3 or 2C-4		
	Bright Dyes FLT Yellow/Green Liquid	Water Line & Drain Tracing Dye	NA	NA	
	Bright Dyes FLT Yellow/Green Tablet	Water Line & Drain Tracing Dye	NA	NA	
SWWS Treatment	Clarifloc C-6265	Polymer Flocculation Agent	NA	NA	
Chemicals ^b	Dog Food	Food Source for Microorganisms	NA	NA	
	Glycerin	Carbon Source for Microorganisms	NA	NA	
	Sodium Bisulfite	Dechlorination	Sodium Bisulfite	2C-4	
	Soda Ash [Na ₂ CO ₃]	Add Alkalinity	Sodium carbonate	NA	
	Sodium Chloride	Chlorine Source for Disinfection Using the MIOX System	Chlorine	2C-4	
	Sulfur Dioxide	Dechlorination	NA	NA	
	Bright Dyes FLT Yellow/Green Liquid	Water Line & Drain Tracing Dye	NA	NA	
	Bright Dyes FLT Yellow/Green Tablet	Water Line & Drain Tracing Dye	NA	NA	

a. See the permit application section provided for Outfall 001 for the Safety Data Sheets associated with SERF.

EDTA = Ethylene Diamine Tetraacetic Acid; MIOX = mixed oxide; NA = not applicable; RO = reverse osmosis; SCC = Strategic Computing Complex; SERF = Sanitary Effluent Reclamation Facility; SWWS = Sanitary Wastewater System

The blowdown from the SCC Cooling Towers can be routed to discharge at Outfall 03A027; discharge at Outfall 001; the Reuse Tank at the Power Plant for recycle at SERF; or discharge to the SWWS treatment plant. The route of the blowdown is determined by demand, volume, and outfall/equipment availability. Attachment E provides the Safety Data Sheets (SDS) associated with the water treatment system at the SCC Cooling Towers. The permit application sections provided for Outfalls 001 and 13S provide the SDSs for SERF and the SWWS, respectively.

2.3 Discharge Rate and Frequency [II.C]

The discharge rates and frequencies for Outfall 03A027 are provided in Table 4.

Table 4 Flow Rates and Frequencies for Discharges to Outfall 03A027							
	Freque	ncy		Flow I	Rates and Vo	lumes	
Source a, b	Days/Week	Months	Average (MGD)	Maximum (MGD)	Average Volume (GPD)	Maximum Volume (GPD)	Duration (days)
SCC Cooling Towers (10 towers)	7	12	0.051	0.105	50,679	104,804	365

a. Blowdown from the SCC Cooling Towers may be routed to Outfall 03A027, Outfall 001, or the SWWS as needed to allow for water recycling, construction, and/or maintenance activities.

GPD = gallons per day; MGD = million gallons per day; SCC = Strategic Computing Complex

3.0 PRODUCTION [Section III]

Section III is not applicable to Outfall 03A027.

b. See the permit application section provided for Outfall 13S for the Safety Data Sheets associated with SWWS.

b. Calculated between October 2017 and September 2016.



4.0 IMPROVEMENTS [Section IV]

The SCC is currently adding 5 additional cooling towers to its cooling system. These towers will utilize the existing water treatment system and makeup water supply described in Section 2.3. A Notice of Change will be submitted for these future changes prior to their implementation and impact to the outfall. Table 5 provides an estimate for the future flow rates and frequencies of makeup water and blowdown when the new towers come online. Attachment B provides a proposed schematic and water balance for the future configuration.

Table 5 Potential Future Flow Rates and Frequencies for Outfall 03A027							
	Freque	ncy		Flow I	Rates and Vo	lumes	
Source	Days/Week	Months	Average (MGD)	Maximum (MGD)	Average Volume (GPD)	Maximum Volume (GPD)	Duration (days)
SCC Cooling Towers (15 Towers)	7.0	12	0.076	0.157	74,436	201,056	365

GPD = gallons per day; MGD = million gallons per day; SCC = Strategic Computing Center

5.0 INTAKE AND EFFLUENT CHARACTERISTICS [Section V]

5.1 Analytical Data [V.A, B, and C]

The analytical results provided for the Outfall 03A027 Permit Reapplication on the Form 2C were provided from the following sources:

- Samples collected on August 29, 2018 and shipped to an independent laboratory for analysis.
- Field samples collected and analyzed on August 29, 2018 for temperature, residual chlorine, and pH.
- Field samples collected and analyzed on February 4, 2019 for sulfite.
- Discharge monitoring report summary for Outfall 03A027 from October 2014 to September 2018 (Attachment D).
- Hardness = 26 mg/L (CaCO₃)

5.2 Potential Pollutants [V.D]

The treatment chemicals associated with the SCC Cooling Tower water treatment system, the use of potable water, and the reuse of SWWS effluent that has be conditioned at the SERF constitutes the pollutant load of the discharge to Outfall 03A027. Table 6 identifies the Table 2C-3 and 2C-4 pollutants by discharge source. It also identifies those pollutants (if any) that were detected in the analytical results from the samples collected for the 2019 Permit Renewal Application.

Table 6 Potential Pollutants by Source for Outfall 03A027				
Source	POTENTIAL Analytical Data Results from Operational Samples Collected Substances Table 2C-3 or 2C-4 Outfall 03A027 and Operational Samples Collected Operation Ope			
	EDTA	2C-4	pH = 7.4 – 9.1 S.U.	
	Potassium Hydroxide	2C-4	pH = 7.4 – 9.1 S.U.	
SCC Cooling Tower Water	Sodium Bisulfite	2C-4	Sulfite 6.0 mg/L	
SCC Cooling Tower Water Treatment Chemicals	Sodium Hydroxide	2C-4	pH = 7.4 – 9.1 S.U.	
Treatment Chemicals	Sodium Phosphate Dibasic	2C-4	Total Phosphorus = 3.55 mg/L	
	Sulfuric Acid	2C-4	pH = 7.4 – 9.1 S.U.	
	Toluene	2C-4	Not Detected (VOC)	
	Chlorine	2C-4	Total Residual Chlorine = 0	
Potable Makeup Water	Chlorine	2C-4	Total Residual Chlorine = 0	
SERF Effluent Makeup Water - Treatment Chemicals Used	Ferric Chloride	2C-4	Chloride = 68.9 mg/L Iron was not detected.	
			iron was not detected.	
at SERF	Hydrochloric Acid	2C-4	pH = 7.4 – 9.1 S.U.	



Table 6 Potential Pollutants by Source for Outfall 03A027				
	POTENTIAL		Analytical Data Results from	
Source	Toxic Pollutant and/or F	Operational Samples Collected for		
	Substances Table 2C-3	3 or 2C-4	Outfall 03A027 ^a	
	Magnesium Chloride	2C-4	Chloride = 68.9 mg/L	
	<u> </u>		Magnesium = 2050 mg/L	
	Sodium Bisulfite	2C-4	Sulfite 6.0 mg/L	
	Sodium Hydroxide	2C-4	pH = 7.4 - 9.1 S.U.	
	Sodium Hypochlorite	2C-4	Chloride = 68.9 mg/L	
	Sodium Nitrite	2C-4	Nitrate/Nitrite = 0.95 mg/L	
	Acetic Acid	2C-4	pH = 7.4 - 9.1 S.U.	
SWWS Treated Effluent	Calcium Hypochlorite	2C-4	Chloride = 68.9 mg/L	
- Treatment Chemicals Used	Chlorine	2C-4	Total Residual Chlorine = 0	
at SWWS	Sodium Bisulfite	2C-4	Sulfite 6.0 mg/L	
at SvvvvS	Sodium Hydroxide	2C-4	pH = 7.4 - 9.1 S.U.	
	Sodium Hypochlorite	2C-4	Chloride = 68.9 mg/L	
	Acetic Acid	2C-4	pH = 7.4 - 9.1 S.U.	
	Acetone	2C-4	Not Analyzed °	
	Ammonia	2C-4	0.112 mg/L	
	Aniline	2C-3 & 2C-4	Not Analyzed °	
	Benzene	2C-4	Not Detected (VOC)	
	Benzoic acid	2C-4	pH = 7.4 - 9.1 S.U.	
	Calcium Hypochlorite	2C-4	Chloride = 68.9 mg/L	
	Carbon Disulfide	2C-3 & 2C-4	Not Analyzed °	
	Chlorine	2C-4	Total residual chlorine = 0	
	Chloroform	2C-4	Not Detected (VOC)	
	Cresol	2C-3 & 2C-4	Not Analyzed ^c	
SWWS Treated Effluent	Ethylbenzene	2C-4	Not Detected (VOC)	
- Chemicals identified on	Polychlorinated Biphenyls b	2C-4	Not Detected	
Influent Waste Stream	Phenol	2C-4	5.03 ug/L	
Profile Forms	Phosphoric Acid	2C-4	pH = 7.4 - 9.1 S.U.	
	Potassium Hydroxide	2C-4	pH = 7.4 - 9.1 S.U.	
	Sodium	2C-4	Not Analyzed ^c	
	Sodium Bisulfite	2C-4	Sulfite 6.0 mg/L	
	Sodium Hydroxide	2C-4	pH = 7.4 - 9.1 S.U.	
	Sodium Hypochlorite	2C-4	Chloride = 68.9 mg/L	
	Sodium Nitrite	2C-4	Nitrate/Nitrite = 0.95 mg/L	
	Strontium	2C-3	Not Analyzed °	
	Styrene	2C-3 & 2C-4	Not Analyzed °	
	Toluene	2C-4	Not Detected (VOC)	
	Uranium	2C-3	Not Analyzed °	
	Vanadium	2C-3	Not Analyzed ^c	

- a. Results are from operational samples collected from the cooling tower blowdown at the SCC. Currently the effluent from the SCC is routed to Outfall 001.
- b. Results were obtained using the EPA Aroclor Method 608.3 as required by the Form 2C. Low concentrations of PCBs have been detected in the waters discharged for treatment at SWWS and in the discharged to Outfall 001 using the Congener Method
- c. The potential pollutant was not analyzed because it is not specifically called out on the Form 2C.

EDTA = Ethylene Diamine Tetra-Acetic Acid; PCB = polychlorinated biphenyls; SCC = Strategic Computing Center; SERF = Sanitary Effluent Reclamation Facility; SVOC = semi-volatile organic compounds; S.U. = Standard Units; SWWS = Sanitary Wastewater System; VOC = Volatile Organic Compound



The safety data sheets associated with the chemicals used to treat water at the SCC, SWWS, and SERF are provided in Attachment E.

6.0 POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]

Section VI is not applicable to Outfall 03A027.

7.0 BIOLOGICAL TOXICITY TESTING DATA [Section VII]

Whole Effluent Toxicity (WET) 7 Day Chronic Toxicity was performed on March 16, 18, and 20 of 2015 to determine the results at a critical dilution of 23% using a dilution series of 10%, 13%, 17%, 23%, and 31%. The WET including the following criteria as required by the permit:

- Ceriodaphnia dubia, 3-hr composite, 1/5 Years (term)
- Pimephales promelas, 3-hr composite, 1/5 Years (term)

The WET test results indicated that the effluent from Outfall 03A027 passed the test for both Ceriodaphnia dubia and Pimephales promelas and no further testing has been performed. See the WET Test Summary Report provided in Attachment D of the Fact Sheet provided with the permit application.

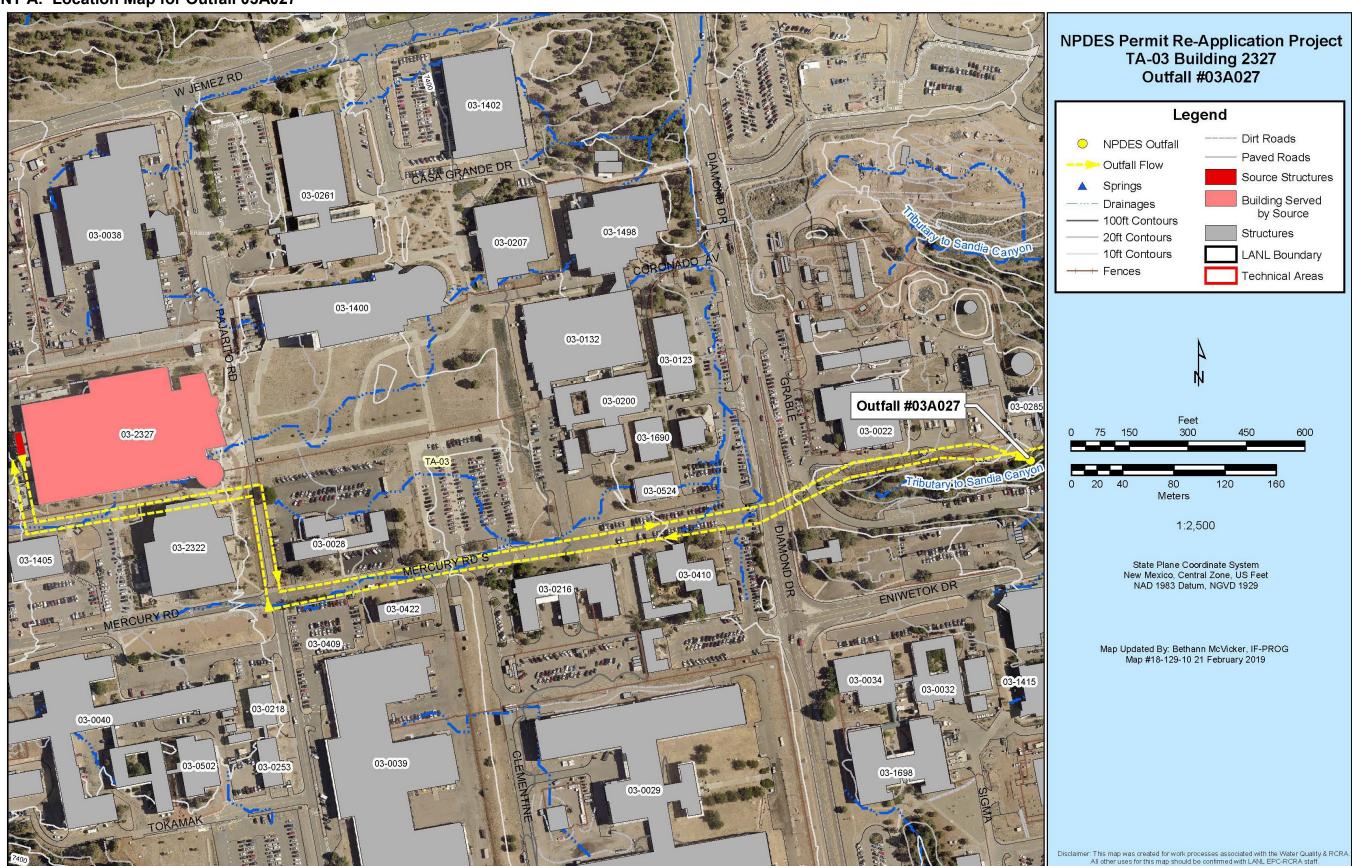
8.0 CONTRACT ANALYSIS INFORMATION [Section VIII]

Samples from the SCC Cooling Tower Blowdown were collected on August 29, 2018 for the Form 2C constituents required by the permit application forms. These samples were submitted to independent laboratories as summarized in in Table 7.

	Table 7				
	List of Independent Laboratories Used for NPDES Water Analysis				
Laboratory Name	Address and Contact Info	Analytes			
GEL Laboratories	2040 Savage Road	Biological Oxygen Demand, General Chemistry, Pesticides,			
LLC	Charleston SC 29407	Polychlorinated Biphenyls, Radiochemistry, Semi-volatile			
	(843) 556-8171	Organic Compounds, Total Metals, Total Suspended Solids,			
		Volatile Organic Compounds			
New Mexico Water	401 North Coronado Ave	E.coli			
Testing Laboratory,	Espanola, NM 87532				
Inc.	(505) 929-4545				
Cape Fear	3306 Kitty Hawk Road Suite 120	TCDD (Dioxin)			
Analytical LLC	Wilmington, NC 28405				
	(910) 795-0421				
Pacific EcoRisk	2250 Cordelia Rd.	Whole Effluent Toxicity			
	Fairfield, CA 94534	·			
	(707) 207-7760				



ATTACHMENT A: Location Map for Outfall 03A027

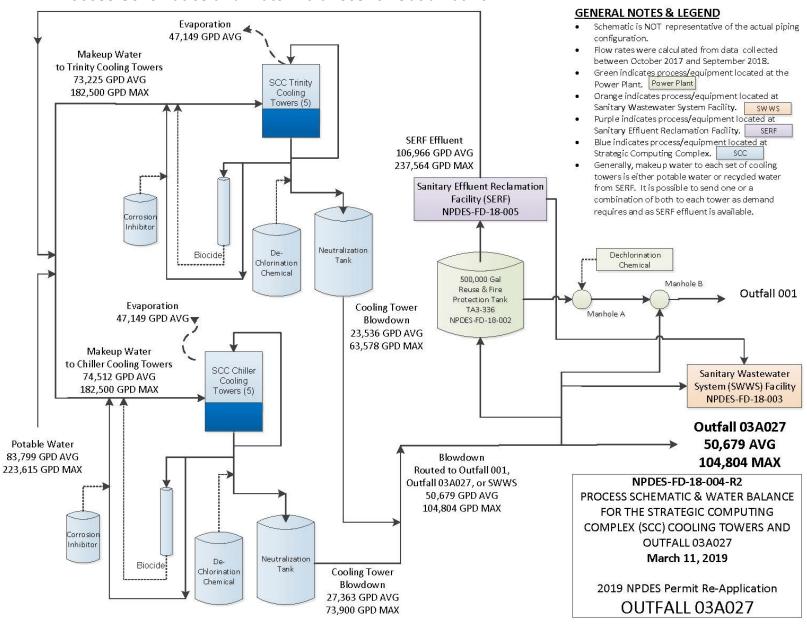




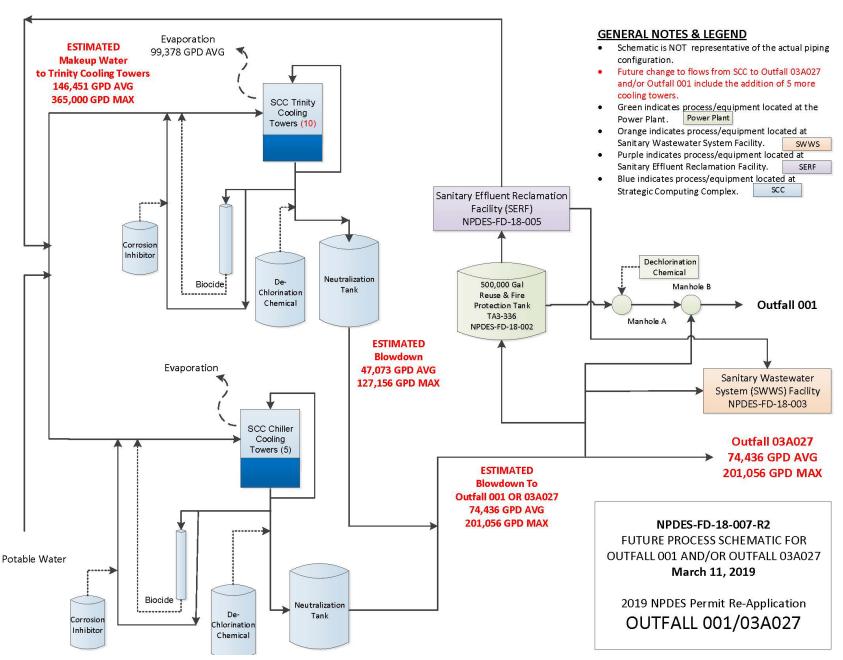
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ATTACHMENT B: Process Schematics and Water Balances for Outfall 03A027









ATTACHMENT C: Photographs

Photograph ID No.	Photograph Title
NPDES-03A027-18-002	Outfall 03A027 Condition at Discharge Location
NPDES-03A027-18-003	Outfall 03A027 Receiving Stream Perennial Reach of Sandia Canyon, Water Quality Segment Number 20.6.4.126 NMAC
NPDES-03A027-18-004	SCC Chiller Cooling Towers
NPDES-03A027-18-005	SCC Chiller Cooling Towers - Raw Chemical Feed
NPDES-03A027-18-006	SCC Chiller Cooling Towers - Corrosion Inhibitor Feed Tank
NPDES-03A027-18-007	SCC Chiller Cooling Towers - Dechlorination Chemical Feed Tank
NPDES-03A027-18-008	SCC Chiller Cooling Towers - Neutralization Tank
NPDES-03A027-18-009	SCC Chiller Cooling Towers - Brominator
NPDES-03A027-18-010	SCC Trinity Cooling Towers
NPDES-03A027-18-011	SCC Trinity Cooling Towers – Dechlorination Chemical Feed Tank
NPDES-03A027-18-012	SCC Trinity Cooling Towers - Brominators
NPDES-03A027-18-013	SCC Trinity Cooling Towers – pH Adjustment Chemical Feed Tank
NPDES-03A027-18-014	SCC Trinity Cooling Towers – Corrosion Inhibitor Feed Tank
NPDES-03A027-18-015	SCC Trinity Cooling Towers – Neutralization Tank



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Photograph - NPDES-03A027-18-002
Outfall 03A027 Condition at Discharge Location



Photograph - NPDES-03A027-18-003
Outfall 03A027 Receiving Stream Perennial Reach of Sandia Canyon,
Water Quality Segment Number 20.6.4.126 NMAC





Photograph - NPDES-03A027-18-004 SCC Chiller Cooling Towers



Photograph - NPDES-03A027-18-005 SCC Chiller Cooling Towers - Raw Chemical Feed





Photograph - NPDES-03A027-18-006 SCC Chiller Cooling Towers - Corrosion Inhibitor Feed Tank



Photograph - NPDES-03A027-18-007 SCC Chiller Cooling Towers - Dechlorination Chemical Feed Tank





Photograph - NPDES-03A027-18-008 SCC Chiller Cooling Towers - Neutralization Tank



Photograph - NPDES-03A027-18-009 SCC Chiller Cooling Towers - Brominator





Photograph - NPDES-03A027-18-010 SCC Trinity Cooling Towers



Photograph - NPDES-03A027-18-011 SCC Trinity Cooling Towers - Dechlorination Chemical Feed Tank





Photograph - NPDES-03A027-18-012 SCC Trinity Cooling Towers - Brominators



Photograph - NPDES-03A027-18-013 SCC Trinity Cooling Towers - pH Adjustment Chemical Feed Tank





Photograph - NPDES-03A027-18-014 SCC Trinity Cooling Towers - Corrosion Inhibitor Feed Tank



Photograph - NPDES-03A027-18-015 SCC Trinity Cooling Towers — Neutralization Tank



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ATTACHMENT D: Summary Discharge Monitoring Report October 2014 – September 2018

ATTACHW	IENI D. 3	ullillia	y Dischar	ge Monitoring Report	October 2	2014 – Sept	ember	2018								
					Quantity or	Loading		Quality or	Concentrat	ion						
OUTFALL No.	TA - Bldg.		Monitoring Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Number of Samples	Frequently	Notes
03A027	TA3-2327	2014	Oct	Flow (Totalized Est.)	0.027965	0.032900	MGD							31	Daily	Permit Requirement
03A027	TA3-2327	2014	Nov	Flow (Totalized Est.)	0.022840	0.026400	MGD							30	Daily	Permit Requirement
03A027	TA3-2327	2014	Dec	Flow (Totalized Est.)	0.023619	0.031600	MGD							31	Daily	Permit Requirement
03A027	TA3-2327	2015	Jan	Flow (Totalized Est.)	0.022339	0.027400	MGD							31	Daily	Permit Requirement
03A027	TA3-2327	2015	Feb	Flow (Totalized Est.)	0.023029	0.026400	MGD							28	Daily	Permit Requirement
03A027	TA3-2327	2015	Mar	Flow (Totalized Est.)	0.026155	0.034400	MGD							31	Daily	Permit Requirement
03A027	TA3-2327	2015	Apr	Flow (Totalized Est.)	0.026600	0.031200	MGD							30	Daily	Permit Requirement
03A027	TA3-2327	2015	May	Flow (Totalized Est.)	0.028423	0.032300	MGD							31	Daily	Permit Requirement
03A027	TA3-2327	2015	Jun	Flow (Totalized Est.)	0.034463	0.039100	MGD							30	Daily	Permit Requirement
03A027	TA3-2327	2015	Jul	Flow (Totalized Est.)	0.033894	0.040000	MGD							31	Daily	Permit Requirement
03A027	TA3-2327	2015	Aug	Flow (Totalized Est.)	0.027181	0.041200	MGD							31	Daily	Permit Requirement
03A027	TA3-2327	2015	Sept	Flow (Totalized Est.)	0.020607	0.027800	MGD							30	Daily	Permit Requirement
03A027	TA3-2327	2015		Flow (Totalized Est.)	0.032220	0.051000	MGD							31	Daily	Permit Requirement
03A027	TA3-2327	2015	Nov	Flow (Totalized Est.)	0.036513	0.047200	MGD							30	Daily	Permit Requirement
03A027	TA3-2327	2015	Dec	Flow (Totalized Est.)	0.038635	0.043300	MGD							31	Daily	Permit Requirement
03A027	TA3-2327	2016		Flow (Totalized Est.)	0.039161	0.042300	MGD							31	Daily	Permit Requirement
03A027	TA3-2327	2016		Flow (Totalized Est.)	0.042517	0.046300	MGD							29	Daily	Permit Requirement
03A027	TA3-2327	2016		Flow (Totalized Est.)	0.030868	0.045500	MGD							31	Daily	Permit Requirement
03A027	TA3-2327	2016		Flow (Totalized Est.)	0.031647	0.036300	MGD							30	Daily	Permit Requirement
03A027	TA3-2327	2016	•	Flow (Totalized Est.)	0.034303	0.039100	MGD							31	Daily	Permit Requirement
03A027	TA3-2327	2016		Flow (Totalized Est.)	0.041623	0.053600	MGD							30	Daily	Permit Requirement
03A027	TA3-2327	2016		Flow (Totalized Est.)	0.047310	0.052600	MGD							31	Daily	Permit Requirement
03A027	TA3-2327	2016		Flow (Totalized Est.)	0.035823	0.043800	MGD							31	Daily	Permit Requirement
03A027	TA3-2327	2016	Sept	Flow (Totalized Est.)	0.031850	0.033500	MGD							8	Daily	Permit Requirement
03A027	TA3-2327	2016		Flow (Totalized Est.)	****	****	MGD							0	Daily	Discharged to Outfall 001
03A027	TA3-2327	2016		Flow (Totalized Est.)	****	****	MGD							0	Daily	Discharged to Outfall 001
03A027	TA3-2327	2016		Flow (Totalized Est.)	****	****	MGD							0	Daily	Discharged to Outfall 001
03A027	TA3-2327		Jan	Flow (Totalized Est.)	****	****	MGD							0	Daily	Discharged to Outfall 001
03A027	TA3-2327	2017		Flow (Totalized Est.)	****	****	MGD							0	Daily	Discharged to Outfall 001
03A027	TA3-2327	2017	Mar	Flow (Totalized Est.)	***	****	MGD							0	Daily	Discharged to Outfall 001
03A027	TA3-2327	2017		Flow (Totalized Est.)	****	***	MGD							0	Daily	Discharged to Outfall 001
03A027	TA3-2327	2017		Flow (Totalized Est.)	****	***	MGD							0	Daily	Discharged to Outfall 001
03A027	TA3-2327	2017		Flow (Totalized Est.)	****	***	MGD							0	Daily	Discharged to Outfall 001
03A027	TA3-2327		Jul	Flow (Totalized Est.)	****	****	MGD							0	Daily	Discharged to Outfall 001
03A027	TA3-2327		Aug	Flow (Totalized Est.)	****	****	MGD							0	Daily	Discharged to Outfall 001
03A027	TA3-2327		Sept	Flow (Totalized Est.)	****	****	MGD							0	Daily	Discharged to Outfall 001
03A027	TA3-2327	2017		Flow (Totalized Est.)	****	****	MGD							0	Daily	Discharged to Outfall 001
03A027	TA3-2327		Nov	Flow (Totalized Est.)	****	****	MGD							0	Daily	Discharged to Outfall 001
03A027	TA3-2327	2017		Flow (Totalized Est.)	****	****	MGD							0	Daily	Discharged to Outfall 001
03A027	TA3-2327	2018		Flow (Totalized Est.)	****	****	MGD							0	Daily	Discharged to Outfall 001



					Quantity or	r Loading		Quality or	Concentrat	ion						
OUTFALL No.	TA - Bldg.	Year	Monitoring Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Number of Samples	Frequently	Notes
03A027	TA3-2327	2018	Feb	Flow (Totalized Est.)	****	****	MGD							0	Daily	Discharged to Outfall 001
03A027	TA3-2327	2018	Mar	Flow (Totalized Est.)	***	****	MGD							0	Daily	Discharged to Outfall 001
03A027	TA3-2327	2018	Apr	Flow (Totalized Est.)	***	****	MGD							0	Daily	Discharged to Outfall 001
03A027	TA3-2327	2018	May	Flow (Totalized Est.)	***	****	MGD							0	Daily	Discharged to Outfall 001
03A027	TA3-2327	2018	Jun	Flow (Totalized Est.)	***	****	MGD							0	Daily	Discharged to Outfall 001
03A027	TA3-2327	2018	Jul	Flow (Totalized Est.)	****	****	MGD							0	Daily	Discharged to Outfall 001
03A027	TA3-2327	2018	Aug	Flow (Totalized Est.)	****	****	MGD							0	Daily	Discharged to Outfall 001
03A027	TA3-2327	2018	Sept	Flow (Totalized Est.)	****	****	MGD							0	Daily	Discharged to Outfall 001
	Maxim	um 30 l	Day Average	Flow (Totalized Est.)	0.0473		MGD							344		
		30 D	ay Maximum	Flow (Totalized Est.)		0.0536	MGD							344		
03A027	TA3-2327	2014	Oct	рН				7.6	****	8	S.U.	6.6-8.8	S.U.	5	Weekly	Permit Requirement
03A027	TA3-2327	2014	Nov	рН				7.8	****	7.9	S.U.	6.6-8.8	S.U.	4	Weekly	Permit Requirement
03A027	TA3-2327	2014	Dec	рН				7.8	****	8	S.U.	6.6-8.8	S.U.	5	Weekly	Permit Requirement
03A027	TA3-2327	2015	Jan	рН				7.8	****	8.2	S.U.	6.6-8.8	S.U.	4	Weekly	Permit Requirement
03A027	TA3-2327	2015	Feb	рН				7.9	****	8.1	S.U.	6.6-8.8	S.U.	4	Weekly	Permit Requirement
03A027	TA3-2327	2015	Mar	pН				7.4	****	7.7	S.U.	6.6-8.8	S.U.	5	Weekly	Permit Requirement
03A027	TA3-2327	2015	Apr	pН				7.7	****	8.2	S.U.	6.6-8.8	S.U.	4	Weekly	Permit Requirement
03A027	TA3-2327	2015	May	pН				7.3	****	7.8	S.U.	6.6-8.8	S.U.	4	Weekly	Permit Requirement
03A027	TA3-2327	2015	Jun	pН				7.5	****	7.9	S.U.	6.6-8.8	S.U.	4	Weekly	Permit Requirement
03A027	TA3-2327	2015	Jul	pН				7.4	****	7.8	S.U.	6.6-8.8	S.U.	5	Weekly	Permit Requirement
03A027	TA3-2327	2015	Aug	pН				7.6	****	8.1	S.U.	6.6-8.8	S.U.	4	Weekly	Permit Requirement
03A027	TA3-2327	2015	Sept	pН				7.6	****	8.4	S.U.	6.6-8.8	S.U.	5	Weekly	Permit Requirement
03A027	TA3-2327	2015	Oct	pН				7.8	****	8.2	S.U.	6.6-8.8	S.U.	4	Weekly	Permit Requirement
03A027	TA3-2327	2015	Nov	pН				7.4	****	8	S.U.	6.6-8.8	S.U.	4	Weekly	Permit Requirement
03A027	TA3-2327	2015	Dec	pН				7.5	****	8.1	S.U.	6.6-8.8	S.U.	5	Weekly	Permit Requirement
03A027	TA3-2327	2016	Jan	pН				8	****	8.4	S.U.	6.6-8.8	S.U.	4	Weekly	Permit Requirement
03A027	TA3-2327	2016	Feb	pН				8.2	****	8.4	S.U.	6.6-8.8	S.U.	4	Weekly	Permit Requirement
03A027	TA3-2327	2016	Mar	pН				8.1	****	8.3	S.U.	6.6-8.8	S.U.	5	Weekly	Permit Requirement
03A027	TA3-2327	2016	Apr	рН				7.9	****	8.2	S.U.	6.6-8.8	S.U.	4	Weekly	Permit Requirement
03A027	TA3-2327	2016	May	рН				7.9	****	8.1	S.U.	6.6-8.8	S.U.	4	Weekly	Permit Requirement
03A027	TA3-2327	2016	Jun	pН				7.9	****	8	S.U.	6.6-8.8	S.U.	5	Weekly	Permit Requirement
03A027	TA3-2327	2016	Jul	pН				7.7	****	8.3	S.U.	6.6-8.8	S.U.	5	Weekly	Permit Requirement
03A027	TA3-2327	2016	Aug	pН				7.9	****	9.1	S.U.	6.6-8.8	S.U.	6	Weekly	Permit Requirement
03A027	TA3-2327	2016	Sept	pН				8	****	8	S.U.	6.6-8.8	S.U.	1	Weekly	Permit Requirement
03A027	TA3-2327	2016	Oct	pН				****	****	****	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2016	Nov	pН				****	****	****	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2016	Dec	pН				****	****	****	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2017	Jan	pН				****	****	****	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2017	Feb	pН				****	****	****	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2017	Mar	pН				****	****	***	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2017	Apr	pН				****	****	****	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001



					Quantity or	r Loading		Quality or	Concentrat	ion						
OUTFALL No.	TA - Bldg.	Year	Monitoring Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Number of Samples	Frequently	Notes
03A027	TA3-2327	2017		pH	Average	Maximum	Onits	****	****	****	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2017		pH				****	****	***	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2017		pH				****	****	***	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327			pH				****	****	***	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327		Sept	рH				****	****	***	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2017	•	pH				****	****	***	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2017	Nov	рH				****	****	***	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2017	Dec	pH				****	****	****	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2018	Jan	рН				****	****	***	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2018	Feb	pH				****	****	***	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2018	Mar	рН				****	****	***	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2018	Apr	рН				****	****	***	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2018	May	рН				****	****	***	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2018	Jun	рН				****	****	***	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2018	Jul	рН				****	****	***	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001
	TA3-2327	2018	Aua	pH				****	****	7.7	S.U.	****	***	1	Operational Sample	2019 Permit Application Sample
03A027	TA3-2327	2018		pH				****	****	***	S.U.	6.6-8.8	S.U.	0	Weekly	Discharged to Outfall 001
		1		рН		30 Day	Average	7.65		8.3		6.6	S.U.	105		gg
				pH			/linimum	7.3				6.6	S.U.	105		
				pH		N	laximum			9.1		8.8	S.U.	105		
03A027	TA3-2327	2014	Oct	Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	5	Weekly	Permit Requirement
03A027	TA3-2327	2014	Nov	Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	4	Weekly	Permit Requirement
03A027	TA3-2327	2014	Dec	Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	5	Weekly	Permit Requirement
03A027	TA3-2327	2015	Jan	Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	4	Weekly	Permit Requirement
03A027	TA3-2327	2015	Feb	Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	4	Weekly	Permit Requirement
03A027	TA3-2327	2015	Mar	Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	4	Weekly	Permit Requirement
03A027	TA3-2327	2015	Apr	Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	4	Weekly	Permit Requirement
03A027	TA3-2327	2015	May	Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	4	Weekly	Permit Requirement
03A027	TA3-2327	2015	Jun	Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	4	Weekly	Permit Requirement
03A027	TA3-2327	2015	Jul	Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	5	Weekly	Permit Requirement
03A027	TA3-2327	2015	Aug	Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	4	Weekly	Permit Requirement
03A027	TA3-2327	2015	Sept	Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	5	Weekly	Permit Requirement
03A027	TA3-2327	2015	Oct	Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	4	Weekly	Permit Requirement
03A027	TA3-2327	2015	Nov	Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	4	Weekly	Permit Requirement
03A027	TA3-2327	2015	Dec	Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	4	Weekly	Permit Requirement
03A027	TA3-2327	2016	Jan	Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	4	Weekly	Permit Requirement
03A027	TA3-2327	2016	Feb	Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	4	Weekly	Permit Requirement
03A027	TA3-2327	2016	Mar	Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	5	Weekly	Permit Requirement
03A027	TA3-2327	2016	Apr	Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	4	Weekly	Permit Requirement
03A027	TA3-2327	2016	May	Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	4	Weekly	Permit Requirement
03A027	TA3-2327	2016	Jun	Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	5	Weekly	Permit Requirement



					Quantity or	r Loading		Quality or	Concentrat	ion						
OUTFALL No.	TA - Bldg.	Year	Monitoring Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Number of Samples	Frequently	Notes
03A027	TA3-2327	2016		Chlorine, Total Residual	711014.90			****	****	0	mg/L	0.011	mg/L	5	Weekly	Permit Requirement
03A027	TA3-2327	2016		Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	6	Weekly	Permit Requirement
03A027	TA3-2327		Sept	Chlorine, Total Residual				****	****	0	mg/L	0.011	mg/L	1	Weekly	Permit Requirement
03A027	TA3-2327		Oct	Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2016	Nov	Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2016	Dec	Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2017	Jan	Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2017	Feb	Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2017	Mar	Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2017	Apr	Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2017	May	Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2017	Jun	Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2017	Jul	Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2017	Aug	Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2017	Sept	Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2017	Oct	Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2017	Nov	Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2017	Dec	Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2018	Jan	Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2018	Feb	Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2018	Mar	Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2018	Apr	Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2018	May	Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2018	Jun	Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327	2018	Jul	Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
03A027	TA3-2327			Chlorine, Total Residual				****	****	0	mg/L	****	***	1	Operational Sample	2019 Permit Application Sample
03A027	TA3-2327	2018		Chlorine, Total Residual				****	****	****	mg/L	0.011	mg/L	0	Weekly	Discharged to Outfall 001
				Chlorine, Total Residual			Average		0.0					103		
				Chlorine, Total Residual	Maxii	mum 30 Day			0	_				103		
				Chlorine, Total Residual		M	aximum			0				103		
03A027	TA3-2327	2014		E.Coli				****	<2.5	6.3	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement
03A027	TA3-2327	2014		E.Coli				****	<1	<1	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement
03A027	TA3-2327			E.Coli				****	<1	<1	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement
03A027	TA3-2327	2015		E.Coli				****	<1	1	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement
03A027	TA3-2327	2015		E.Coli				****	<1	<1	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement
03A027	TA3-2327	2015		E.Coli				****	<1	<1	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement
03A027	TA3-2327	2015		E.Coli				****	<1	1	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement
03A027	TA3-2327	2015		E.Coli				****	<1	<1	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement
03A027	TA3-2327	2015		E.Coli				****	<1	<1	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement
03A027	TA3-2327	2015		E.Coli				****	<1	<1	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement
03A027	TA3-2327	2015	Aug	E.Coli				***	<1.4	2	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement



					Quantity of	r Loading		Quality or	Concentrat	ion						
OUTFALL No.	TA - Bldg.	Year	Monitoring Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Number of Samples	Frequently	Notes
03A027	TA3-2327	2015		E.Coli	71101490	III CONTINUE III	- Cinto	****	<1	<1	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement
03A027	TA3-2327	2015	'	E.Coli				***	<1	1	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement
03A027	TA3-2327	2015		E.Coli				***	<1	1	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement
03A027	TA3-2327	2015		E.Coli				****	<1	<1	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement
03A027	TA3-2327	2016		E.Coli				****	<1	<1	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement
03A027	TA3-2327	2016		E.Coli				****	<1	<1	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement
03A027	TA3-2327	2016		E.Coli				****	<1	<1	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement
03A027	TA3-2327	2016		E.Coli				****	<1	<1	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement
03A027	TA3-2327	2016		E.Coli				****	<1	<1	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement
03A027	TA3-2327		Jun	E.Coli				***	<1	<1	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement
03A027	TA3-2327	2016		E.Coli				****	<1	<1	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement
03A027	TA3-2327	2016		E.Coli				***	<1	1	cfu/100ml	548-2507	cfu/100ml	2	2/Month	Permit Requirement
03A027	TA3-2327	2016		E.Coli				****	<1	1	cfu/100ml	548-2507	cfu/100ml	1	2/Month	Permit Requirement
03A027	TA3-2327	2016	'	E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
03A027	TA3-2327	2016		E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
03A027	TA3-2327		Dec	E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
03A027	TA3-2327		Jan	E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
03A027	TA3-2327	2017		E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
03A027	TA3-2327	2017		E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
03A027	TA3-2327	2017		E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
03A027	TA3-2327	2017	•	E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
03A027	TA3-2327	2017		E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
03A027	TA3-2327		Jul	E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
03A027	TA3-2327		Aug	E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
03A027	TA3-2327		Sept	E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
03A027	TA3-2327		Oct	E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
03A027	TA3-2327			E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
03A027	TA3-2327	2017		E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
03A027	TA3-2327			E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
03A027	TA3-2327	2018		E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
03A027	TA3-2327			E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
03A027	TA3-2327	2018		E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
03A027	TA3-2327	2018		E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
03A027	TA3-2327	2018		E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
03A027	TA3-2327			E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
03A027	TA3-2327			E.Coli				***	****	<1	cfu/100ml	****	****	1	Operational Sample	2019 Permit Application Sample
03A027	TA3-2327	2018		E.Coli				****	****	****	cfu/100ml	548-2507	cfu/100ml	0	2/Month	Discharged to Outfall 001
				E.Coli		Daily	Average		1.9					48		
				E.Coli	Maxi	mum 30 Day			6.3					48		
				E.Coli		Daily N	laximum			6.3				48		
03A027	TA3-2327	2014	Dec	Total Suspended Solids				****	2.1	2.1	mg/L	30 Monthly, 100 Daily Max	mg/L	1	Quarterly	Permit Requirement



					Quantity or	Loading		Quality or	Concentrat	ion						
					•									Number		
OUTFALL	TA -		Monitoring						_					of		
No.	Bldg.	Year	Period	Parameter Tatal Cooperand of Calida	Average	Maximum	Units	Minimum ****		Maximum	Units	Permit Limit	Units	Samples		Notes
03A027	TA3-2327	2015		Total Suspended Solids				****	2.6	2.6	mg/L	30 Monthly, 100 Daily Max	mg/L	1 1	Quarterly	Permit Requirement
03A027	TA3-2327	2015		Total Suspended Solids				****	2.3	2.3	mg/L	30 Monthly, 100 Daily Max	mg/L	1 1	Quarterly	Permit Requirement
03A027	TA3-2327	2015		Total Suspended Solids				****	2	2	mg/L	30 Monthly, 100 Daily Max	mg/L	1 1	Quarterly	Permit Requirement
03A027	TA3-2327	2015		Total Suspended Solids				****	1.3	1.3	mg/L	30 Monthly, 100 Daily Max	mg/L	1	Quarterly	Permit Requirement
03A027	TA3-2327	2016		Total Suspended Solids				****	1.5	1.5	mg/L	30 Monthly, 100 Daily Max	mg/L	1	Quarterly	Permit Requirement
03A027	TA3-2327	2016		Total Suspended Solids				****	2.2	2.2	mg/L	30 Monthly, 100 Daily Max	mg/L	1	Quarterly	Permit Requirement
03A027	TA3-2327		Sept	Total Suspended Solids				****	4.86	5.52	mg/L	30 Monthly, 100 Daily Max	mg/L	2	Quarterly	Permit Requirement
03A027	TA3-2327	2016		Total Suspended Solids				****	****	****	mg/L	30 Monthly, 100 Daily Max	mg/L	0	Quarterly	Discharged to Outfall 001
03A027	TA3-2327	2017		Total Suspended Solids				****	****	****	mg/L	30 Monthly, 100 Daily Max	mg/L	0	Quarterly	Discharged to Outfall 001
03A027	TA3-2327		Jun	Total Suspended Solids				****	****	****	mg/L	30 Monthly, 100 Daily Max	mg/L	0	Quarterly	Discharged to Outfall 001
03A027	TA3-2327	2017	Sept	Total Suspended Solids				****	****	****	mg/L	30 Monthly, 100 Daily Max	mg/L	0	Quarterly	Discharged to Outfall 001
03A027	TA3-2327	2017		Total Suspended Solids				****	****	****	mg/L	30 Monthly, 100 Daily Max	mg/L	0	Quarterly	Discharged to Outfall 001
03A027	TA3-2327	2018		Total Suspended Solids				****	****	****	mg/L	30 Monthly, 100 Daily Max	mg/L	0	Quarterly	Discharged to Outfall 001
03A027	TA3-2327	2018	Jun	Total Suspended Solids				****	****	****	mg/L	30 Monthly, 100 Daily Max	mg/L	0	Quarterly	Discharged to Outfall 001
00400=	TAC 0007	0040		T.4.10				****	4.0			00 M	****		Operational	2019 Permit Application
03A027	TA3-2327	2018		Total Suspended Solids				****	1.9	1.9	mg/L	30 Monthly, 100 Daily Max		1 1	Sample	Sample
03A027	TA3-2327	2018	Sept	Total Suspended Solids					****	****	mg/L	30 Monthly, 100 Daily Max	mg/L	0	Quarterly	Discharged to Outfall 001
				Total Suspended Solids		Daily	Average		2.3				mg/L	10		
				Total Suspended Solids	Maxii	num 30 Day	Average		4.86				mg/L	10		
				Total Suspended Solids		N.	laximum			5.52			mg/L	10		
03A027	TA3-2327	2014		Phosphorus, Total				****	3.19	3.19	mg/L	20 Monthly, 40 Daily Max	mg/L	1	Quarterly	Permit Requirement
03A027	TA3-2327	2015	Mar	Phosphorus, Total				****	3.19	3.19	mg/L	20 Monthly 40 Daily Max	mg/L	1	Quarterly	Permit Requirement
03A027	TA3-2327	2015		Phosphorus, Total				****	3.2	3.2	mg/L	20 Monthly 40 Daily Max	mg/L	1	Quarterly	Permit Requirement
03A027	TA3-2327	2015	Sept	Phosphorus, Total				****	3.55	3.55	mg/L	20 Monthly 40 Daily Max	mg/L	1	Quarterly	Permit Requirement
03A027	TA3-2327	2015		Phosphorus, Total				****	2.04	2.04	mg/L	20 Monthly 40 Daily Max	mg/L	1	Quarterly	Permit Requirement
03A027	TA3-2327	2016	Mar	Phosphorus, Total				****	0.239	0.239	mg/L	20 Monthly 40 Daily Max	mg/L	1	Quarterly	Permit Requirement
03A027	TA3-2327	2016	Jun	Phosphorus, Total				****	0.929	0.929	mg/L	20 Monthly 40 Daily Max	mg/L	1	Quarterly	Permit Requirement
03A027	TA3-2327	2016	Sept	Phosphorus, Total				****	1.55	1.55	mg/L	20 Monthly 40 Daily Max	mg/L	1	Quarterly	Permit Requirement
03A027	TA3-2327	2016	Dec	Phosphorus, Total				****	****	****	mg/L	20 Monthly 40 Daily Max	mg/L	0	Quarterly	Discharged to Outfall 001
03A027	TA3-2327	2017	Mar	Phosphorus, Total				****	****	****	mg/L	20 Monthly 40 Daily Max	mg/L	0	Quarterly	Discharged to Outfall 001
03A027	TA3-2327	2017	Jun	Phosphorus, Total				****	****	****	mg/L	20 Monthly 40 Daily Max	mg/L	0	Quarterly	Discharged to Outfall 001
03A027	TA3-2327	2017		Phosphorus, Total				****	****	****	mg/L	20 Monthly 40 Daily Max	mg/L	0	Quarterly	Discharged to Outfall 001
03A027	TA3-2327	2017	Dec	Phosphorus, Total				****	****	****	mg/L	20 Monthly 40 Daily Max	mg/L	0	Quarterly	Discharged to Outfall 001
03A027	TA3-2327	2018	Mar	Phosphorus, Total				****	****	****	mg/L	20 Monthly 40 Daily Max	mg/L	0	Quarterly	Discharged to Outfall 001
03A027	TA3-2327	2018	Jun	Phosphorus, Total				****	****	****	mg/L	20 Monthly 40 Daily Max	mg/L	0	Quarterly	Discharged to Outfall 001
															Operational	2019 Permit Application
03A027	TA3-2327			Phosphorus, Total				****	1.87	1.87	mg/L	***	****	1	Sample	Sample
03A027	TA3-2327	2018	Aug	Phosphorus, Total				****	****	****	mg/L	20 Monthly 40 Daily Max	mg/L	0	Quarterly	Discharged to Outfall 001
				Phosphorus, Total		Daily	Average		2.20					9		
				Phosphorus, Total	Maxir	num 30 Day			3.55					9		
				Phosphorus, Total	maxii		laximum		0.00	3.55				9		
024027	TA2 2227	2015	Cont				laxiiiiuiii		0.00644		m a/l	NIA	NΙΛ	1	Torm	Dermit Dequirement
03A027	TA3-2327	2015	Sept	Chromium VI			_		0.00641	0.00641	mg/L	NA	NA	1	Term	Permit Requirement
				Chromium VI			Average		0.00641					1		
				Chromium VI	Maxir	num 30 Day	Average			0.00641				1		
				Chromium VI		IV	laximum			0.00641				1		
03A027	TA3-2327	2015	Sept	Copper				****	0.0181	0.0181	mg/L	NA	NA	1	Yearly	Permit Requirement
03A027	TA3-2327			Copper				****	0.00847	0.00847	mg/L	NA	NA	2	Yearly	Permit Requirement
03A027	TA3-2327	2017	•	Copper				****	****	****	mg/L	NA NA	NA	0	Yearly	Discharged to Outfall 001
UUMUZI	170-2321	ZU11	υσρι	Loophei					L		my/L	INA	INA	1 0	l carry	Discriarged to Outrail 001



					Quantity or	· Loading		Quality or	Concentrat	ion						
OUTFALL No.	TA - Bldg.	Year	Monitoring Period	Parameter		Maximum	Units			Maximum	Units	Permit Limit	Units	Number of Samples	Frequently	Notes
															Operational	2019 Permit Application
03A027	TA3-2327			Copper				****	0.0163	0.0163	mg/L	NA	NA	1	Sample	Sample
03A027	TA3-2327	2018	Sept	Copper				****	****	****	mg/L	NA	NA	0	Yearly	Discharged to Outfall 001
				Copper		Daily	Average		0.0143					4		
				Copper	Maxir	num 30 Day	Average		0.0181					4		
				Copper		IV	laximum			0.0181				4		
03A027	TA3-2327	2015	Sept	Aluminum, Total				****	0.0232	0.0232	mg/L	NA	NA	1	Yearly	Permit Requirement
03A027	TA3-2327	2016	Sept	Aluminum, Total				****	0.0156	0.0156	mg/L	NA	NA	1	Yearly	Permit Requirement
03A027	TA3-2327	2017	Sept	Aluminum, Total				****	****	****	mg/L	NA	NA	0	Yearly	Discharged to Outfall 001
03A027	TA3-2327	2018		Aluminum, Total				****	<0.0193	<0.0193	mg/L	NA	NA	1	Operational Sample	2019 Permit Application Sample
03A027	TA3-2327	2018	Sept	Aluminum, Total				****	****	****	mg/L	NA	NA	0	Yearly	Discharged to Outfall 001
				Aluminum		Daily	Average		0.0194					3	,	
				Aluminum	Maxir	num 30 Day			0.0232					3		
				Aluminum			laximum			0.0232				3		
	Τ			7 114111114						0.0202		0.00064 Monthly Ave,				
03A027	TA3-2327	2015	Sept	PCBs, Total				****	0.000269	0.000269	ug/L	0.000642 Daily Max	ug/L	1	Yearly	Permit Requirement
004007	T40 0007	0040			0.000000	0 0000005		****	0.0004	0.0004	,,	0.00064 Monthly Ave,	,,			
03A027	TA3-2327	2016	Sept	PCBs, Total	0.0000065	0.0000065	lbs/day	****	0.0024	0.0024	ug/L	0.000642 Daily Max 0.00064 Monthly Ave,	ug/L	1	Yearly	Permit Requirement
03A027	TA3-2327	2017	Sept	PCBs, Total				****	****	****	ug/L	0.000642 Daily Max	ug/L	0	Yearly	Discharged to Outfall 001
00/102/	1710 2021	2011	Сорг	1 020, 10101							<u> </u>	0.00064 Monthly Ave,	ug/ L		1 carry	Biodiai god to odtidii oo i
03A027	TA3-2327	2018	Sept	PCBs, Total				****	****	****	ug/L	0.000642 Daily Max	ug/L	0	Yearly	Discharged to Outfall 001
				PCBs, Total		Daily	Average		0.0013					2		
				PCBs, Total	Maxir	num 30 Day	Average		0.0024					2		
				PCBs, Total		N	laximum			0.0024				2		
03A027	TA3-2327	2015	Sept	Gross Alpha				****	****	****	pCi/L	NA	NA	0	Term	Not Required
03A027	TA3-2327			Gross Alpha				****	1.01	1.01	pCi/L	NA	NA	1	Term	Permit Requirement
03A027	TA3-2327			Gross Alpha				****	****	****	pCi/L	NA	NA	0	Term	Discharged to Outfall 001
03A027	TA3-2327			Gross Alpha				***	2.79	2.79	pCi/L	NA NA	NA	1	Operational Sample	2019 Permit Application Sample
03A027	TA3-2327			Gross Alpha				****	****	****	pCi/L	NA NA	NA	0	Term	Discharged to Outfall 001
JUNUZI	IAU-ZUZI	2010	ОСРІ	Gross Alpha		Daily	Average		1.90		pCi/L	INC	1 1/7	2	TOTTI	Discriarged to Outrain 001
				Gross Alpha		num 30 Day			2.79		pCi/L			2		
									2.19	2.70						
				Gross Alpha		IV	laximum			2.79	pCi/L			2		



2019 NPDES Permit Reapplication - WET Test Summary Report OUTFALL 03A027

Υ	ear	Sample Dates	Fathead Minno)W ^a			Ceriodaphnia d	lubia ª				
			Survival		Growth		Survival		Reproduction		Frequency	Driver
	2015	March 16, 18, 20	NOEC 31% Pass		NOEC 31%	Pass	NOEC 31%	Pass	NOEC 31%	Pass	Term	Permit Requirement

a. Permit requires a critical dilution of 23% and analysis at (10%, 13%, 17%, 23%, and 31%).

No Observed Lethal Effect Concentration - Defined as the greatest effluent dilution at and below which toxicity that is statistically different from the control NOEC at the 95% confidence level does not occur.



ATTACHMENT E: Safety Data Sheets

IST OF SAFETY DATA SHEETS	
romocide	
IACH 1407028	
IACH 203832	
IACH 2076053	
IACH 2105669	
IACH 2263411	
IACH 2263511	
IACH 2297255	
IACH 2314011	
IACH 2314111	
IACH 2756549	
VEST C-358P Inhibitor	
VEST C-825	
VEST R-630	
right Dyes FLT Yellow/Green Liquid	
right Dyes FLT Yellow/Green Tablet	



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BROMOCIDE





SAFETY DATA SHEET BROMICIDE TABLETS

1. Identification

Product identifier

Product name BROMICIDE TABLETS

Chemical name Bromo-chloro-5,5-dimethylhydantoin

Product number 100405, 100406, 100407, 100412, 100414, 100794, 101187

CAS number 32718-18-6

Recommended use of the chemical and restrictions on use

Application Biocides for water treatment.

Details of the supplier of the safety data sheet

Supplier BWA Water Additives US LLC

1979 Lakeside Parkway Suite 925, Tucker, GA30084

USA

T: +1 800 600 4523 T: +1 678 802 3050

E: msds@wateradditives.com

Emergency telephone number

Emergency telephone CHEMTREC Phone: 1-800-424-9300

2. Hazard(s) identification

Classification of the substance or mixture

Physical hazards Ox. Sol. 3 - H272

Health hazards Acute Tox. 4 - H302 Skin Corr. 1C - H314 Eye Dam. 1 - H318 Skin Sens. 1 - H317

Environmental hazards Aquatic Acute 1 - H400

Label elements

Pictogram









Signal word

Danger

Hazard statements H272 May intensify fire; oxidizer.

H302 Hamful if swallowed.

H314 Causes severe skin burns and eye damage.

H317 May cause an allergic skin reaction.

H400 Very toxic to aquatic life.



BROMICIDE TABLETS

Precautionary statements P210 Keep away from heat, sparks, open flames and hot surfaces. No smoking.

P220 Keep away from combustible materials.

P221 Take any precaution to avoid mixing with combustibles.

P260 Do not breathe vapor/ spray. P261 Avoid breathing vapor/ spray.

P264 Wash contaminated skin thoroughly after handling. P270 Do not eat, drink or smoke when using this product.

P272 Contaminated work clothing must not be allowed out of the workplace.

P273 Avoid release to the environment.

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

P301+P310 If swallowed: Immediately call a poison center/ doctor. P301+P330+P331 If swallowed: Rinse mouth. Do NOT induce vomiting.

P302+P352 If on skin: Wash with plenty of water.

P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse

skin with water/ shower.

P304+P340 If inhaled: Remove person to fresh air and keep comfortable for breathing.

P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact

lenses, if present and easy to do. Continue rinsing.

P321 Specific treatment (see medical advice on this label).

P333+P313 If skin irritation or rash occurs: Get medical advice/ attention.

P362+P364 Take off contaminated clothing and wash it before reuse.

P363 Wash contaminated clothing before reuse.

P370+P378 In case of fire: Use foam, carbon dioxide, dry powder or water fog to extinguish.

P391 Collect spillage. P405 Store locked up.

P501 Dispose of contents/ container in accordance with national regulations.

Contains Bromo-chloro-5,5-dimethylhydantoin

3. Composition/information on ingredients

Mixtures

Bromo-chloro-5,5-dimethylhydantoin

96.0%

CAS number: 32718-18-6

M factor (Acute) = 1

Classification

Ox. Sol. 3 - H272 Acute Tox. 4 - H302 Skin Corr. 1C - H314 Eye Dam. 1 - H318 Skin Sens. 1 - H317 Aquatic Acute 1 - H400

Inert ingredients 4.0%

CAS number: -

Classification

Not Classified

The Full Text for all Hazard Statements are Displayed in Section 16.

Composition comments 1-bromo-3-chloro-5,5-dimethylhydantoin



BROMICIDE TABLETS

4. First-aid measures

Description of first aid measures

Inhalation Move affected person to fresh air and keep warm and at rest in a position comfortable for

breathing. Get medical attention. Show this Safety Data Sheet to the medical personnel.

Ingestion Do not induce vomiting. Give plenty of water to drink. Rinse mouth thoroughly with water.

Never give anything by mouth to an unconscious person. Get medical attention. Show this

Safety Data Sheet to the medical personnel.

Skin Contact Remove contaminated clothing. Rinse immediately with plenty of water. Continue to rinse for

at least 15 minutes. Get medical attention. Show this Safety Data Sheet to the medical

personnel.

Eye contact Rinse immediately with plenty of water. Remove any contact lenses and open eyelids wide

apart. Continue to rinse for at least 15 minutes. Get medical attention. Show this Safety Data

Sheet to the medical personnel.

Most important symptoms and effects, both acute and delayed

Inhalation Dust may irritate the respiratory system.

May cause stomach pain or vomiting. May cause chemical burns in mouth and throat. Due to Indestion

the physical nature of this material it is unlikely that swallowing will occur.

Skin contact Chemical burns. Burning pain and severe corrosive skin damage.

Eye contact Severe irritation, burning and tearing.

Indication of immediate medical attention and special treatment needed

Notes for the doctor If lavage is performed suggest endotracheal and/or esophageal control. Danger from lung

> aspiration must be weighed against toxicity when considering emptying the stomach. The decision of whether to induce vomiting or not should be made by a physician. Chemical eye burns may require extended irrigation. Obtain prompt consultation preferably from an opthalmologist.If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical

condition of the patient.

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media Extinguish with the following media: Water spray, fog or mist. Alcohol-resistant foam.

Unsuitable extinguishing

media

Carbon dioxide (CO2). Dry chemicals.

Special hazards arising from the substance or mixture

Specific hazards Toxic gases/vapors/fumes of: Bromine. Chlorine. Oxides of the following substances: Carbon.

Nitrogen. Thermal decomposition or combustion products may include the following

substances: Toxic gases or vapors.

Advice for firefighters

Protective actions during

firefighting

Move containers from fire area if it can be done without risk. Control run-off water by

containing and keeping it out of sewers and watercourses.

for firefighters

Special protective equipment Leave danger zone immediately. Wear positive-pressure self-contained breathing apparatus

(SCBA) and appropriate protective clothing.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures



BROMICIDE TABLETS

Personal precautions Follow precautions for safe handling described in this safety data sheet. For personal

protection, see Section 8.

Environmental precautions

Environmental precautions Avoid release to the environment. To prevent release, place container with damaged side up.

Methods and material for containment and cleaning up

Methods for cleaning up Provide adequate ventilation. Contain spillage with sand, earth or other suitable non-

combustible material. Avoid the spillage or runoff entering drains, sewers or watercourses. Collect spillage for reclamation or disposal in sealed containers via a licensed waste contractor. Containers with collected spillage must be properly labeled with correct contents and hazard symbol. Wash thoroughly after dealing with a spillage. Avoid generation and

spreading of dust. Avoid contact with water.

Reference to other sections For personal protection, see Section 8. For waste disposal, see section 13.

7. Handling and storage

Precautions for safe handling

Usage precautions Provide adequate ventilation. Avoid inhalation of vapors. Use approved respirator if air

contamination is above an acceptable level. Do not use in confined spaces without adequate ventilation and/or respirator. Avoid spilling. Avoid contact with skin and eyes. Avoid contact with the following materials: Acids. Moisture. Avoid handling which leads to dust formation.

Conditions for safe storage, including any incompatibilities

Storage precautions Store in tightly-closed, original container in a dry, cool and well-ventilated place. Keep

container tightly closed. Protect from light. Keep away from heat, sparks and open flame.

Store away from the following materials: Reducing agents.

Storage class Oxidizer storage.

Specific end uses(s)

Specific end use(s) The identified uses for this product are detailed in Section 1.2.

8. Exposure Controls/personal protection

Ingredient comments No exposure limits known for ingredient(s).

Exposure controls

Protective equipment





Appropriate engineering controls All handling should only take place in well-ventilated areas.

Eye/face protection The following protection should be worn: Chemical splash goggles or face shield.

Hand protection Selection of a suitable glove depends on work conditions and whether the product is present

on its own or in combination with other substances. Wear protective gloves made of the following material: Butyl rubber. Neoprene. Nitrile rubber. Polyethylene. Polyvinyl chloride (PVC). Gloves should be replaced immediately if signs of degradation are observed.

Other skin and body protection Wear appropriate clothing to prevent any possibility of skin contact. Wear a suitable dust

mask. Wear apron or protective clothing in case of contact.



BROMICIDE TABLETS

Hygiene measures Use engineering controls to reduce air contamination to permissible exposure level. Provide

> eyewash station. No specific hygiene procedures recommended but good personal hygiene practices should always be observed when working with chemical products. Contaminated

clothing should be placed in a closed container for disposal or decontamination.

Respiratory protection Wear a suitable dust mask.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Tablet. Appearance

Color White/off-white. Odor Slight. Halogen

Odor threshold Not available. Not available.

рΗ pH (diluted solution): 3.5 @ 0.15 %

156 - 162°C Melting point Initial boiling point and range Not known.

Freezing Point

Flash point Not applicable. Evaporation rate Not known. Evaporation factor Not applicable. Upper/lower flammability or

explosive limits

Not available.

0.0038 Pa @ °C Vapor pressure Not available. Vapor density Relative density Not applicable.

Bulk density 0.9 kg/l

Solubility(ies) 0.15 @ °C Slightly soluble in water.

Partition coefficient log Pow: 0.35 Not available. Auto-ignition temperature Viscosity Not known.

Explosive properties There are no chemical groups present in the product that are associated with explosive

properties.

Oxidizing properties The product contains a substance classified as oxidizing. Keep away from flammable and

combustible materials.

Molecular weight 241.47

C5 H6 Br Cl N2 O2 Molecular Formula

10. Stability and reactivity

Reactivity This material has oxidising properties.

Stability Stable at normal ambient temperatures. Avoid the following conditions: Moisture.



BROMICIDE TABLETS

Possibility of hazardous

reactions

Will not polymerize.

Conditions to avoid Generates toxic gas in contact with acid. Avoid excessive heat for prolonged periods of time.

Avoid heat, flames and other sources of ignition.

Materials to avoid Strong acids. Strong reducing agents. Strong alkalis.

Hazardous decomposition

products

Toxic gases/vapors/fumes of: Hydrogen bromide (HBr). Bromine. Hydrogen chloride (HCl).

Chlorine. Oxides of the following substances: Carbon. Nitrogen.

11. Toxicological information

Information on toxicological effects

Toxicological effects Ames Test negative

Other health effects There is no evidence that the product can cause cancer.

Supplemental Toxicological

Information

Acute toxicity - oral

Acute toxicity oral (LDso

mg/kg)

578.0

Species Rat
ATE oral (mg/kg) 520.83

Acute toxicity - dermal

Acute toxicity dermal (LD60

mg/kg)

2,000.0

Species Rabbit

Germ cell mutagenicity

Genotoxicity - in vitro Ames test: Negative.

Inhalation May cause respiratory system irritation.

Ingestion Harmful if swallowed.

Skin Contact Causes burns. May cause sensitisation by skin contact.

Eye contact Causes burns.

Acute and chronic health

hazards

Causes severe burns. May cause sensitisation by skin contact.

Route of entry Skin and/or eye contact Ingestion.

12. Ecological Information

Ecotoxicity The product contains a substance which is very toxic to aquatic organisms.

Toxicity

Acute toxicity - fish LC50, 96 hours: 0.87 mg/l, Onchorhynchus mykiss (Rainbow trout)

LC50, 96 hours: 0.87 mg/l, Fish



BROMICIDE TABLETS

Acute toxicity - aquatic

invertebrates

EC₅₀, 48 hours: 0.46 mg/l, Daphnia magna EC₅₀, 48 hours: 0.46 mg/l, Daphnia magna

Persistence and degradability

Persistence and degradability

Halogens will dissociate in water leaving DMH. DMH is readily biodegradable in a CO2 Evolution study and passes the 10-day window criteria. DMH has also been shown to be

rapidly degraded in a water/sediment system.

Chemical oxygen demand

1.005 g O₂/g substance

Bioaccumulative potential

Bio-Accumulative Potential Low bioaccumulation potential

Partition coefficient log Pow: 0.35

Mobility in soil

Mobility

No information available.

Results of PBT and vPvB assessment

Results of PBT and vPvB

assessment

This substance is not classified as PBT or vPvB according to current EU criteria.

Other adverse effects

Acute Toxicity. Lc50 96 Hours, >640 American Oyster

Mg/L

13. Disposal considerations

Waste treatment methods

General information When handling waste, the safety precautions applying to handling of the product should be

considered.

Disposal methods Dispose of waste to licensed waste disposal site in accordance with the requirements of the

local Waste Disposal Authority. Absorb in vermiculite, dry sand or earth and place into containers. Dispose of waste via a licensed waste disposal contractor. Liquid material should be incinerated. Material absorbed onto sand or earth should be disposed of as solid waste in accordance with local regulations. Empty packaging may contain product residues and due

consideration should be given prior to disposal.

Waste class 07 01 99

14. Transport information

UN Number

UN No. (TDG) 3085 UN No. (IMDG) 3085 UN No. (ICAO) 3085 UN No. (DOT) 3085

UN proper shipping name

Proper shipping name (TDG) OXIDISING SOLID, CORROSIVE, N.O.S., (contains bromo-chloro-dimethylhydantoin) 5.1(8),

PGIII, MARINE POLLUTANT

Proper shipping name (IMDG) OXIDISING SOLID, CORROSIVE, N.O.S., (contains bromo-chloro-dimethylhydantoin) 5.1(8),

PGIII, MARINE POLLUTANT



BROMICIDE TABLETS

Proper shipping name (ICAO) OXIDISING SOLID, CORROSIVE, N.O.S., (contains bromo-chloro-dimethylhydantoin) 5.1(8),

PGIII, MARINE POLLUTANT

Proper shipping name (DOT) OXIDISING SOLID, CORROSIVE, N.O.S., (contains bromo-chloro-dimethylhydantoin) 5.1(8),

PGIII, MARINE POLLUTANT

Transport hazard class(es)

TDG class 5.1+8 TDG label(s) 5.1+8 **IMDG Class** 5.1+8 ICAO class/division 5.1 ICAO subsidiary risk 8

Transport labels





Packing group

TDG Packing Group 111 IMDG packing group 111 ICAO packing group Ш DOT packing group Ш

Environmental hazards

Environmentally Hazardous Substance



Special precautions for user

EmS F-A, S-Q

Transport in bulk according to Not applicable. Annex II of MARPOL 73/78

and the IBC Code

Classification Code (Adr)

OC2

15. Regulatory information

Regulatory Status This chemical is a pesticide product registered by the Environmental Protection Agency and is

> subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label: DANGER Avoid contact with eyes, skin and clothing. EPA Reg. No.

83451-4

29 CFR 1910.1010 Federal Regulations (OSHA Standard) Regulatory References

Canadian Regulatory Status PMRA PCP No. 31855



BROMICIDE TABLETS

16. Other information

General information For advice on chemical emergencies, spillages, fires or first aid in relation to this product

please contact the relevant emergency number below: EU/English Speakers - +44 (0) 1235 239 670 (NCEC) Arabic Speakers - +44 (0) 1235 239 671 Asia/Pacific countries - +65 3158

1074 Within Mainland China: +86 532 8388 9090 (NRCC).

To/From China: +86 10 5100 3039 (NCEC)

Revision comments Section 15 revision, added US regulatory status and EPA Reg. No.

Issued by BWA Water Additives Regulatory Group, +44(0)1618646699

Revision date 3/28/2016

Revision 9

SDS No. 11306

Hazard statements in full H272 May intensify fire; oxidizer.

H302 Harmful if swallowed.

H314 Causes severe skin burns and eye damage.

H317 May cause an allergic skin reaction. H318 Causes serious eye damage. H400 Very toxic to aquatic life.

KIWA Certification

NSF Non Food Program

NSF/ANSI Standard 60

For safety reasons it is IMPERATIVE that customers:-

^{1.} Ensure that all those within their control who use the products are supplied with all relevant information contained within the Safety Data Sheet and Technical Bulletin concerning the applications for which the product is designed and any instructions and warnings contained therein.

^{2.} Consult BWA Water Additives before using or supplying the product for any other applications. The information contained herein is based on the present state of our knowledge and is intended to describe our products from the point of view of safety requirements. It should not therefore be construed as guaranteeing specific properties.



HACH 1407028





SAFETY DATA SHEET

Issue Date 09-Jun-2016 Revision Date 15-Jan-2018 Version 2.2 Page 1/15

1. IDENTIFICATION

Product identifier

Product Name Sulfuric Acid Solution 19.2 N

Other means of identification

Product Code(s) 203832

Safety data sheet number M00471

UN/ID no UN2796

Recommended use of the chemical and restrictions on use

Recommended Use Standard solution. Laboratory Use.

Uses advised against None. Restrictions on use None.

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

Emergency telephone number

+1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Corrosive to metals	Category 1
Skin corrosion/irritation	Category 1
Serious eye damage/eye irritation	Category 1
Respiratory sensitization	1 W - C C C C C C C C C C C C C C C C C C
Skin sensitization	
Mutagenicity	
Carcinogenicity	
Reproductive toxicity	
Specific target organ toxicity (single exposure)	
Specific target organ toxicity (repeated exposure)	

Hazards not otherwise classified (HNOC)

Data insufficient for GHS classification but significant enough for mention suggests:

CANCER HAZARD. STRONG INORGANIC ACID MISTS CONTAINING SULFURIC ACID CAN CAUSE CANCER. Inhalation of low concentrations of sulfuric acid may result in airway irritation such as cough and shortness of breath; high concentrations may result in acute effects such as cough.

EN / AGHS Page 1/15



Product Code(s) 203832 Issue Date 09-Jun-2016 Version 2.2 Product Name Sulfuric Acid Solution 19.2 N Revision Date 15-Jan-2018

Page 2/15

Label elements

Signal word - Danger



Hazard statements

H290 - May be corrosive to metals

H314 - Causes severe skin burns and eye damage

Precautionary statements

P260 - Do not breathe dust/fume/gas/mist/vapors/spray

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting

P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower

P363 - Wash contaminated clothing before reuse

P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

P405 - Store locked up

P501 - Dispose of contents/ container to an approved waste disposal plant

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P310 - Immediately call a POISON CENTER or doctor/physician

P234 - Keep only in original container

P390 - Absorb spillage to prevent material damage

Other Hazards Known

Harmful to aquatic life

3. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Substance</u>

Not applicable

<u>Mixture</u>

Percent ranges are used where confidential product information is applicable.

Chemical name	CAS No.	Percent Range	HMRIC #
Sulfuric acid	7664-93-9	40 - 50%	9

EN / AGHS Page 2/15



Product Code(s) 203832 Issue Date 09-Jun-2016 Version 2.2 **Product Name** Sulfuric Acid Solution 19.2 N **Revision Date** 15-Jan-2018

Page 3/15

4. FIRST AID MEASURES

Description of first aid measures

General advice Show this safety data sheet to the doctor in attendance. Immediate medical attention is

required.

Inhalation Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical

attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. Get immediate medical

advice/attention.

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Remove contact lenses, if present and easy to do. Continue rinsing. Keep eye wide open

while rinsing. Do not rub affected area. Get immediate medical advice/attention.

Skin contact Wash off immediately with soap and plenty of water while removing all contaminated

clothes and shoes. Get immediate medical advice/attention.

Ingestion Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth

to an unconscious person. Do NOT induce vomiting. Get immediate medical

advice/attention.

Self-protection of the first aider

Avoid contact with skin, eyes or clothing. Ensure that medical personnel are aware of the

material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid direct contact with skin. Use barrier to give mouth-to-mouth

resuscitation.

Most important symptoms and effects, both acute and delayed

Symptoms Burning sensation.

Indication of any immediate medical attention and special treatment needed

Note to physicians Product is a corrosive material. Use of gastric lavage or emesis is contraindicated.

Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood

pressure may occur with moist rales, frothy sputum, and high pulse pressure.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media Use extinguishing measures that are appropriate to local circumstances and the

surrounding environment.

Unsuitable Extinguishing Media Caution: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the

chemical

The product causes burns of eyes, skin and mucous membranes. Thermal decomposition

can lead to release of irritating gases and vapors.

Hazardous combustion products May emit toxic and corrosive fumes.

Special protective equipment for

fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout

gear.

6. ACCIDENTAL RELEASE MEASURES

EN / AGHS Page 3/15



Product Code(s) 203832 Issue Date 09-Jun-2016

Version 2.2

Product Name Sulfuric Acid Solution 19.2 N

Revision Date 15-Jan-2018

Page 4/15

U.S. Notice Only persons properly qualified to respond to an emergency involving hazardous

substances may respond to a spill according to federal regulations (OSHA 29 CFR

1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Outside of the US, only persons properly qualified according to state or local regulations

should respond to a spill involving chemicals.

Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal

protective equipment as required. Attention! Corrosive material. Evacuate personnel to

safe areas. Keep people away from and upwind of spill/leak.

Other Information Refer to protective measures listed in Sections 7 and 8.

Environmental precautions

Environmental precautions Prevent further leakage or spillage if safe to do so. Should not be released into the

environment. Do not allow to enter into soil/subsoil. Prevent product from entering drains.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Pick up and transfer to properly labeled containers.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

Reference to other sections See section 8 for more information. See section 13 for more information.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with

skin, eyes or clothing. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation. Do not eat, drink or smoke when using this product. Take off contaminated

clothing and wash before reuse.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from

moisture. Store locked up. Keep out of the reach of children. Store away from other

materials.

Flammability class Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Sulfuric acid	TWA: 0.2 mg/m ³	TWA: 1 mg/m³	IDLH: 15 mg/m³
CAS#: 7664-93-9		(vacated) TWA: 1 mg/m³	TWA: 1 mg/m³

EN / AGHS Page 4/15



Product Code(s) 203832 Issue Date 09-Jun-2016

Version 2.2

Product Name Sulfuric Acid Solution 19.2 N

Revision Date 15-Jan-2018

Page 5/15

Appropriate engineering controls

Engineering Controls

Showers

Eyewash stations Ventilation systems.

Individual protection measures, such as personal protective equipment

Respiratory protection

No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

Hand Protection Wear suitable gloves. Impervious gloves.

Eye/face protection Face protection shield.

Skin and body protection Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron.

General Hygiene Considerations Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this

product. Regular cleaning of equipment, work area and clothing is recommended. Avoid contact with skin, eyes or clothing. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Contaminated work clothing should not be allowed out of the workplace. Wash hands before breaks and immediately after handling the product.

Environmental exposure controls Local authorities should be advised if significant spillages cannot be contained. Do not

allow into any sewer, on the ground or into any body of water.

Thermal hazards None under normal processing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state

Liquid

Appearance aqueous solution Odor Acidic

Color colorless
Odor threshold No data available

Property Values Remarks • Method

Molecular weight No data available

pH < 0.5

Melting point/freezing point ~ -33 °C / -27 °F Estimation based on theoretical

calculation

Boiling point / boiling range ~ 109 °C / 228 °F Estimation based on theoretical

calculation

Evaporation rate 1.19 (water = 1) Estimation based on theoretical

calculation

Vapor pressure 20.477 mm Hg / 2.73 kPa at 25 °C / 77 °F Estimation based on theoretical

calculation

Vapor density (air = 1) 0.03 (air = 1)

Specific gravity (water = 1 / air = 1) 1.535

Partition Coefficient (n-octanol/water)

Not applicable

Soil Organic Carbon-Water Partition

Not applicable

Coefficient

EN / AGHS Page 5/15



Product Code(s) 203832 Product Name Sulfuric Acid Solution 19.2 N

Issue Date 09-Jun-2016 Revision Date 15-Jan-2018

Version 2.2 Page 6/15

Autoignition temperature

Decomposition temperature

No data available

Solubility(ies)

Water solubility

Water solubility classification	Water solubility_	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Solubility in other solvents

Chemical Name	Solubility classification	Solubility	Solubility Temperature
Acid	Soluble	> 1000 mg/L	25 °C / 77 °F

Other Information

Metal Corrosivity

Classified as corrosive to metal according to GHS criteria

Steel Corrosion Rate 17.78 mm/yr / 0.7 in/yr Aluminum Corrosion Rate 12.7 mm/yr / 0.5 in/yr

Volatile Organic Compounds (VOC) Content

Chemical name	CAS No.	Volatile organic compounds (VOC) content	CAA (Clean Air Act)
Sulfuric acid	7664-93-9	No data available	2

Explosive properties

Upper explosion limitNo data availableLower explosion limitNo data available

Flammable properties

Flash point No data available
Method No information available

Flammability Limit in Air
Upper flammability limit:

Upper flammability limit:
Lower flammability limit:
No data available
No data available

Oxidizing properties
No data available.

Bulk density
Not applicable

Particle Size No information available

Particle Size Distribution No information available

10. STABILITY AND REACTIVITY

EN / AGHS Page 6/15



Product Code(s) 203832 Product Name Sulfuric Acid Solution 19.2 N

Issue Date 09-Jun-2016 Revision Date 15-Jan-2018

Version 2.2 Page 7/15

Reactivity Not applicable.

Chemical stability

Stability Stable under normal conditions.

Explosion data

Sensitivity to Mechanical Impact None Sensitivity to Static Discharge None.

Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing

Hazardous polymerization None under normal processing.

Conditions to avoid

Conditions to avoid Exposure to air or moisture over prolonged periods.

Incompatible materials

Incompatible materials Oxidizing agent. Acids. Bases.

Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information

Inhalation Specific test data for the substance or mixture is not available. Corrosive by inhalation.

(based on components). Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs.

Pulmonary edema can be fatal.

Eye contact Specific test data for the substance or mixture is not available. Causes burns. (based on

components). Corrosive to the eyes and may cause severe damage including blindness.

Causes serious eye damage. May cause irreversible damage to eyes.

Specific test data for the substance or mixture is not available. May cause irritation. Skin contact

Specific test data for the substance or mixture is not available. Causes burns. (based on Ingestion

components). Ingestion causes burns of the upper digestive and respiratory tracts. May cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung

damage if swallowed. May be fatal if swallowed and enters airways.

Symptoms 5 cm Redness. Burning. May cause blindness. Coughing and/ or wheezing.

Aggravated Medical Conditions Eye disorders. Skin disorders. Respiratory disorders. Preexisting eye disorders. Teeth.

Toxicologically synergistic None known.

products Toxicokinetics, metabolism and See ingredients information below.

distribution

	Chemical name	Toxicokinetics, metabolism and distribution	
	Sulfuric acid	The corrosivity of sulfuric acid makes it difficult to assess its effects on metabolism. Its corrosivity is also the	
E	EN / AGHS	Page 7/15	



Product Code(s) 203832 Issue Date 09-Jun-2016

Version 2.2 Page 8/15

Revision Date 15-Jan-2018

Chemical name	Toxicokinetics, metabolism and distribution
,	main contributor to acute deaths, therefore it is not classified for acute toxicity.
CAS#: 7664-93-9	

Product Name Sulfuric Acid Solution 19.2 N

Product Acute Toxicity Data

Oral Exposure Route No data available **Dermal Exposure Route** No data available Inhalation (Dust/Mist) Exposure Route No data available Inhalation (Vapor) Exposure Route No data available Inhalation (Gas) Exposure Route No data available

Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

Acute Toxicity Estimations (ATE)

ATEmix (oral)	No information available
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	No information available
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

Ingredient Acute Toxicity Data

al Exposure Route	If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (40 - 50%) CAS#: 7664-93-9	Rat LD50	2140 mg/kg	None reported	None reported	IUCLID (The International Uniform Chemical Information Database)

Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (40 - 50%) CAS#: 7664-93-9	Rat LC50	at 0.510 mg/L None		None reported	LOLI

Inhalation (Gas) Exposure Route

If available, see data below

Product Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route No data available No data available **Dermal Exposure Route** Inhalation (Dust/Mist) Exposure Route No data available Inhalation (Vapor) Exposure Route No data available No data available Inhalation (Gas) Exposure Route

Ingredient Specific Target Organ Toxicity Single Exposure Data

If available, see data below **Oral Exposure Route** Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below If available, see data below Inhalation (Vapor) Exposure Route

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (40 - 50%) CAS#: 7664-93-9	Human TD∟∘	0.144 mg/L	5 minutes	Lungs, Thorax, or Respiration Dyspnea	RTECS (Registry of Toxic Effects of Chemical Substances)

Inhalation (Gas) Exposure Route If available, see data below

Aspiration toxicity

EN / AGHS Page 8/15

Product Name Sulfuric Acid Solution 19.2 N

Revision Date 15-Jan-2018



Product Code(s) 203832 Issue Date 09-Jun-2016

Version 2.2 Page 9/15

No data available

Product Skin Corrosion/Irritation Data

No data available.

Ingredient Skin Corrosion/Irritation Data

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sulfuric acid (40 - 50%) CAS#: 7664-93-9	Existing human experience	Human	None reported	None reported	Corrosive to skin	HSDB (Hazardous Substances Data Bank)

Product Serious Eye Damage/Eye Irritation Data

No data available.

Ingredient Eye Damage/Eye Irritation Data

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sulfuric acid (40 - 50%) CAS#: 7664-93-9	Existing human experience	Human	None reported	None reported	Corrosive to eyes	HSDB (Hazardous Substances Data Bank)

Sensitization Information

Product Sensitization Data

Skin Sensitization Exposure RouteNo data available.Respiratory Sensitization Exposure RouteNo data available.

Ingredient Sensitization Data

Skin Sensitization Exposure Route If available, see data below. Respiratory Sensitization Exposure Route If available, see data below.

Chronic Toxicity Information

Product Specific Target Organ Toxicity Repeat Dose Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available.
No data available.
No data available.
No data available.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

Oral Exposure Route
Dermal Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
If available, see data below
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Vapor) Exposure Route

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data	
Sulfuric acid	Human	.003 mg/L	168 days	Musculoskeletal	RTECS (Registry of Toxic	
(40 - 50%)	TC _{Lo}			Changes in teeth and	Effects of Chemical	
CAS#: 7664-93-9				supporting structures	Substances)	

Inhalation (Gas) Exposure Route If available, see data below

Product Carcinogenicity Data

Oral Exposure Route

Dermal Exposure Route

Inhalation (Dust/Mist) Exposure Route

No data available
No data available
No data available

EN / AGHS Page 9/15



Product Code(s) 203832 Issue Date 09-Jun-2016

Version 2.2

Product Name Sulfuric Acid Solution 19.2 N

Revision Date 15-Jan-2018

Page 10 / 15

No data available Inhalation (Vapor) Exposure Route Inhalation (Gas) Exposure Route No data available

Ingredient Carcinogenicity Data

17.	ngicalone our only bata								
	Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA			
	Sulfuric acid	7664-93-9	A2	Group 1	Known	Χ			

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	A2 - Suspected Human Carcinogen
IARC (International Agency for Research on Cancer)	Group 1 - Carcinogenic to Humans
NTP (National Toxicology Program)	Known - Known Carcinogen
OSHA (Occupational Safety and Health Administration of the US Department of	X - Present
Labor)	

Oral Exposure Route If available, see data below **Dermal Exposure Route** If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Germ Cell Mutagenicity invitro Data

No data available.

Ingredient Germ Cell Mutagenicity invitro Data

If available, see data below

Chemical name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Sulfuric acid (40 - 50%) CAS#: 7664-93-9	Cytogenetic analysis	Hamster ovary	4 mmol/L	None reported	Positive test result for mutagenicity	No information available

Product Germ Cell Mutagenicity invivo Data

No data available Oral Exposure Route **Dermal Exposure Route** No data available Inhalation (Dust/Mist) Exposure Route No data available Inhalation (Vapor) Exposure Route No data available Inhalation (Gas) Exposure Route No data available

Ingredient Germ Cell Mutagenicity invivo Data

If available, see data below Oral Exposure Route Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below If available, see data below Inhalation (Vapor) Exposure Route Inhalation (Gas) Exposure Route If available, see data below

Product Reproductive Toxicity Data

Oral Exposure Route No data available **Dermal Exposure Route** No data available Inhalation (Dust/Mist) Exposure Route No data available Inhalation (Vapor) Exposure Route No data available Inhalation (Gas) Exposure Route No data available

Ingredient Reproductive Toxicity Data

Oral Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid	Rabbit	.02 mg/L	7 hours	Specific Developmental	No information available
EN / AGHS					Page 10/15

LA-UR-19-22215



Product Code(s) 203832 Issue Date 09-Jun-2016 Product Name Sulfuric Acid Solution 19.2 N

Revision Date 15-Jan-2018

Page 11 / 15

3	(40 - 50%) CAS#: 7664-93-9	TC _L o	Abnormalities Musculoskeletal system	
	Inhalation (Gas) Exposure Route If available, see data below			

12. ECOLOGICAL INFORMATION

Ecotoxicity

Version 2.2

Product Ecological Data

Aquatic toxicity

FishNo data availableCrustaceaNo data availableAlgaeNo data available

Ingredient Ecological Data

Aquatic toxicity

Fish If available, see ingredient data below Crustacea If available, see ingredient data below Algae No data available

Other Information

Persistence and degradability

Product Biodegradability Data

No data available.

Ingredient Biodegradability Data

Bioaccumulation

Product Bioaccumulation Data

No data available.

Partition Coefficient (n-octanol/water) Not applicable

Ingredient Bioaccumulation Data

Mobility

Soil Organic Carbon-Water Partition Coefficient Not applicable

Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Other adverse effects

No information available.

	13. DISPOSAL CONSIDERATIONS	
EN / AGHS		Page 11 / 15



Product Code(s) 203832 Product Name Sulfuric Acid Solution 19.2 N

Issue Date 09-Jun-2016 Revision Date 15-Jan-2018

Version 2.2 **Page** 12 / 15

Waste treatment methods

Waste from residues/unused

products

Dispose of in accordance with local regulations. Dispose of waste in accordance with

environmental legislation.

Contaminated packaging Do not reuse empty containers.

US EPA Waste Number D002

Special instructions for disposal Work in an approved fume hood. Dilute material with excess water making a weaker than

5% solution. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Open cold water tap completely, slowly pour the reacted material to the drain.

Allow cold water to run for 5 minutes to completely flush the system.

14. TRANSPORT INFORMATION

U.S. DOT

UN/ID no UN2796

Proper shipping name Sulfuric acid solution

Hazard Class 8
Packing Group ||

Description UN2796, Sulfuric acid solution, 8, II

Emergency Response Guide 157

Number

TDG

UN/ID no UN2796

Proper shipping name Battery fluid, acid

Hazard Class

Packing Group

Description UN2796, Battery fluid, acid, 8, II

IATA

UN/ID no UN2796

Proper shipping name Sulphuric acid solution

Hazard Class 8
Packing Group II
ERG Code 8L

Description UN2796, Sulphuric acid solution, 8, II

IMDG

UN/ID no UN2796

Proper shipping name Sulphuric acid solution

Hazard Class 8
Packing Group II
EmS-No F-A,

Description UN2796, Sulphuric acid solution, 8, II

Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods.

If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

EN / AGHS Page 12/15



Product Code(s) 203832 Product Name Sulfuric Acid Solution 19.2 N

Issue Date 09-Jun-2016 Revision Date 15-Jan-2018

Version 2.2 **Page** 13 / 15

National Inventories

TSCA Complies DSL/NDSL Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EINECS/ELINCS Complies **ENCS** Complies **IECSC** Complies KECL Complies Complies **PICCS TCSI** Complies AICS Complies Complies **NZIoC**

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substances Inventory

AICS - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical name	SARA 313 - Threshold Values %
Sulfuric acid (CAS #: 7664-93-9)	1.0

SARA 311/312 Hazard Categories

Acute health hazard	Yes
Chronic Health Hazard	Yes
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sulfuric acid 7664-93-9	1000 lb	2-	-	X

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

Chemical name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Sulfuric acid 7664-93-9	1000 lb	1000 lb	RQ 1000 lb final RQ
EN / AGHS			Page 13/1



Product Code(s) 203832 Issue Date 09-Jun-2016 Version 2.2 Product Name Sulfuric Acid Solution 19.2 N

Revision Date 15-Jan-2018

Page 14 / 15

202	2
	DO 4541- 61DO
	RO 454 kg final RO
	rea io i ig iliai rea

U.S. - DEA (Drug Enforcement Administration) List I & List II

Chemical name	U.S DEA (Drug Enforcement Administration) - List Lor Precursor	U.S DEA (Drug Enforcement Administration) - List II or Essential
	Chemicals	Chemicals
Sulfuric acid (40 - 50%) CAS#: 7664-93-9	Not Listed	50 gallon Export Volume (exports, transshipments and international transactions to designated countries)

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Sulfuric acid	X	X	X
7664-93-9			

U.S. EPA Label Information

Chemical name	FIFRA	FDA
Sulfuric acid	180.0910	21 CFR 184.1095

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Special Comments

None

Additional information

Global Automotive Declarable Substance List (GADSL)

Not applicable

NFPA and HMIS Classifications

NFPA	Health hazards - 3	Flammability - 0	Instability - 0	Physical and Chemical Properties -
HMIS	Health hazards - 3	Flammability - 0	Physical Hazards - 0	Personal protection - X - See section 8 for more information

Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH Immediately Dangerous to Life or Health

ACGIH (American Conference of Governmental Industrial Hygienists)

NDF no date

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

EN / AGHS	Page 14/15



Product Code(s) 203832 Product Name Sulfuric Acid Solution 19.2 N

Issue Date 09-Jun-2016 Revision Date 15-Jan-2018

Version 2.2 **Page** 15 / 15

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)

MAC Maximum Allowable Concentration Ceiling Ceiling Limit Value

X Listed Vacated These values have no official status. The only

binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state

regulations.

SKN* Skin designation SKN+ Skin sensitization
RSP+ Respiratory sensitization ** Hazard Designation
C Carcinogen R Reproductive toxicant

M mutagen

Prepared By Hach Product Compliance Department

 Issue Date
 09-Jun-2016

 Revision Date
 15-Jan-2018

Revision Note None

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY©2017

End of Safety Data Sheet

EN / AGHS Page 15/15



HACH 203832





SAFETY DATA SHEET

Issue Date 25-Apr-2018 Revision Date 25-Apr-2018 Version 8.400001 Page 1/15

1. IDENTIFICATION

Product identifier

Product Name DPD Free Chlorine Reagent

Other means of identification

 Product Code(s)
 1407099

 Safety data sheet number
 M00109

HMRIC# HMIRA Registry Number 9935 Filed 2016-04-11

Recommended use of the chemical and restrictions on use

Recommended Use Laboratory Use. Determination of Free Chlorine.

Uses advised against None. Restrictions on use None.

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

Emergency telephone number

+1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Signal word - Warning



EN / AGHS Page 1/15



Product Name DPD Free Chlorine Reagent Revision Date 25-Apr-2018 Page 2 / 15

Hazard statements

H315 - Causes skin irritation H319 - Causes serious eye irritation

Precautionary statements

P302 + P352 - IF ON SKIN: Wash with plenty of soap and water

P332 + P313 - If skin irritation occurs: Get medical advice/attention

P362 - Take off contaminated clothing and wash before reuse

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P337 + P313 - If eye irritation persists: Get medical advice/attention

Other Hazards Known

Not applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable

<u>Mixture</u>

Chemical Family

Mixture.

Percent ranges are used where confidential product information is applicable.

Chemical name	CAS No.	Percent Range	HMRIC#
Sodium phosphate dibasic	7558-79-4	30 - 40%	==
Salt of N,N-Diethyl-p-Phenylenediamine	=	1 - 5%	-
Disodium EDTA	139-33-3	1 - 5%	=

EN / AGHS Page 2/15



Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 3/15

4. FIRST AID MEASURES

Description of first aid measures

General advice Show this safety data sheet to the doctor in attendance.

Inhalation Remove to fresh air. Get medical attention immediately if symptoms occur.

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep

eye wide open while rinsing. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists. Do not rub affected area.

Skin contact Wash off immediately with soap and plenty of water for at least 15 minutes. Get medical

attention if irritation develops and persists.

Ingestion Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth

to an unconscious person. Do NOT induce vomiting. Call a physician.

Self-protection of the first aider Avoid contact with skin, eyes or clothing.

Most important symptoms and effects, both acute and delayed

Symptoms Burning sensation.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media Use extinguishing measures that are appropriate to local circumstances and the

surrounding environment.

Unsuitable Extinguishing Media Caution: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the

chemical

No information available.

Hazardous combustion products Carbon monoxide, Carbon dioxide. Phosphorus oxides. Nitrogen oxides.

Special protective equipment for

fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout

gear.

6. ACCIDENTAL RELEASE MEASURES

U.S. Notice Only persons properly qualified to respond to an emergency involving hazardous

substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and

guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Outside of the US, only persons properly qualified according to state or local regulations should respond to a spill involving chemicals.

should respond to a spill involving chemical

Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal

protective equipment as required.

Other Information Refer to protective measures listed in Sections 7 and 8.

EN / AGHS Page 3/15



Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 4/15

Environmental precautions

Environmental precautions Prevent further leakage or spillage if safe to do so.

Methods and material for containment and cleaning up

Methods for containmentPrevent further leakage or spillage if safe to do so.Methods for cleaning upPick up and transfer to properly labeled containers.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

Reference to other sections See section 8 for more information. See section 13 for more information.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with

skin, eyes or clothing. Do not eat, drink or smoke when using this product. Take off

contaminated clothing and wash before reuse.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place.

Flammability class Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines This product, as supplied, does not contain any hazardous materials with occupational

exposure limits established by the region specific regulatory bodies

Appropriate engineering controls

Engineering Controls St

Showers

Eyewash stations Ventilation systems.

Individual protection measures, such as personal protective equipment

exceeded or irritation is experienced, ventilation and evacuation may be required.

Hand Protection Wear suitable gloves. Impervious gloves.

Eyelface protection If splashes are likely to occur, wear safety glasses with side-shields.

Skin and body protection Wear suitable protective clothing. Long sleeved clothing.

General Hygiene Considerations Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this

product. Avoid contact with skin, eyes or clothing.

Environmental exposure controls Local authorities should be advised if significant spillages cannot be contained. Do not

allow into any sewer, on the ground or into any body of water.

EN / AGHS Page 4/15

1% Solution



Product Code(s) 1407099 Issue Date 25-Apr-2018 Version 8.400001

Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 5/15

Thermal hazards None under normal processing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state

Solid

Appearance powder Odor Odorless Color White to light pink Odor threshold No data available

Values Remarks • Method Property

Molecular weight No data available

рΗ

Melting point/freezing point No data available Boiling point / boiling range No data available Evaporation rate Not applicable Vapor pressure Not applicable Vapor density (air = 1) Not applicable

Specific gravity (water = 1 / air = 1) 1.76

Partition Coefficient (n-octanol/water) log Kow ~ 0 Soil Organic Carbon-Water Partition

Coefficient

log Koc ~ 0

No data available Autoignition temperature 110 °C / 230 °F Decomposition temperature Dynamic viscosity Not applicable Kinematic viscosity Not applicable

Solubility(ies) Water solubility

Water solubility classification	Water solubility_	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Solubility in other solvents

Chemical Name	Solubility classification	<u>Solubility</u>	Solubility Temperature
Acid	Soluble	> 1000 mg/L	25 °C / 77 °F

Other Information

Metal Corrosivity

Steel Corrosion Rate Not applicable **Aluminum Corrosion Rate** Not applicable

Volatile Organic Compounds (VOC) Content

Not applicable

EN / AGHS Page 5/15



Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 6/15

Chemical name	CAS No.	Volatile organic compounds (VOC) content	CAA (Clean Air Act)
Sodium phosphate dibasic	7558-79-4	No data available	-
Salt of	:н.	Not applicable	
N,N-Diethyl-p-Phenylenediamine			
Disodium EDTA	139-33-3	No data available	[□]

Explosive properties

Upper explosion limit No data available Lower explosion limit No data available

Flammable properties

Flash point Not applicable

Flammability Limit in Air

Upper flammability limit:
Lower flammability limit:
No data available
No data available

Oxidizing properties
No data available.

Bulk density No data available

Particle Size No information available

Particle Size Distribution No information available

10. STABILITY AND REACTIVITY

Reactivity
Not applicable

Chemical stability

Stability Stable under normal conditions.

Explosion data

Sensitivity to Mechanical Impact None Sensitivity to Static Discharge None.

Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing.

Hazardous polymerization
None under normal processing.

Conditions to avoid

Conditions to avoid None known based on information supplied.

Incompatible materials

Incompatible materials Strong acids. Strong bases. Strong oxidizing agents.

Hazardous Decomposition Products

Carbon dioxide. Carbon monoxide. Phosphorus oxides. Nitrogen oxides.

11. TOXICOLOGICAL INFORMATION

EN / AGHS Page 6/15



Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 7/15

Information on Likely Routes of Exposure

Product Information

Inhalation May cause irritation of respiratory tract.

Eye contact Irritating to eyes. Causes serious eye irritation.

Skin contact Causes skin irritation.

Ingestion Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Symptoms Redness. May cause redness and tearing of the eyes.

Aggravated Medical Conditions Skin disorders. Eye disorders.

Toxicologically synergistic None known.

products

Toxicokinetics, metabolism and See ingredients information below.

distribution

Chemical name	Toxicokinetics, metabolism and distribution
dibasic (30 - 40%)	Phosphates are widely utilized by cells for metabolism of proteins, fats and carbohydrates.
CAS#: 7558-79-4 Disodium EDTA (1 - 5%) CAS#: 139-33-3	EDTA and related compounds are poorly absorbed by the digestive system.

Product Acute Toxicity Data

Oral Exposure Route

Dermal Exposure Route

Inhalation (Dust/Mist) Exposure Route

Inhalation (Vapor) Exposure Route

Inhalation (Gas) Exposure Route

No data available

No data available

No data available

No data available

Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

Acute Toxicity Estimations (ATE)

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)	19,881.00 mg/kg
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	No information available
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

Ingredient Acute Toxicity Data

Oral Exposure Route If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Salt of N,N-Diethyl-p-Phenyl enediamine (1 - 5%) CAS#: -	Rat LD ₅₀	695 mg/kg	None reported	None reported	Outside testing
Disodium EDTA	Rat	2000 mg/kg	None	None reported	RTECS (Registry of Toxic

EN / AGHS Page 7/15



Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 8/15

(1 - 5%) CAS#: 139-33-3	LD50		reported		Effects of Chemical Substances)
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sodium phosphate dibasic (30 - 40%) CAS#: 7558-79-4	Rat LD50	17000 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)
Disodium EDTA (1 - 5%) CAS#: 139-33-3	Rabbit LD50	2300 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)

Dermal Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
If available, see data below
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below

Product Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
No data available
No data available
No data available

Ingredient Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route
Dermal Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
If available, see data below
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below

Aspiration toxicity
If available, see data below
Kinematic viscosity

nematic viscosity Not applicable

Product Skin Corrosion/Irritation Data

No data available.

Ingredient Skin Corrosion/Irritation Data

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sodium phosphate dibasic (30 - 40%) CAS#: 7558-79-4	Standard Draize Test	Rabbit	500 mg	24 hours	Skin irritant	RTECS (Registry of Toxic Effects of Chemical Substances)
Disodium EDTA (1 - 5%) CAS#: 139-33-3	Standard Draize Test	Rabbit	500 mg	20 hours	Not corrosive or irritating to skin	ECHA (The European Chemicals Agency)

Product Serious Eye Damage/Eye Irritation Data

No data available.

Ingredient Eye Damage/Eye Irritation Data

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sodium phosphate dibasic	Standard Draize Test	Rabbit	500 mg	24 hours	Eye irritant	RTECS (Registry of Toxic Effects of

EN / AGHS Page 8/15



Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 9/15

(30 - 40%) CAS#: 7558-79-4						Chemical Substances)
Disodium EDTA (1 - 5%) CAS#: 139-33-3	Standard Draize Test	Rabbit	50 mg	None reported	Mild eye irritant	ECHA (The European Chemicals Agency)

Sensitization Information

Product Sensitization Data

 Skin Sensitization Exposure Route
 No data available.

 Respiratory Sensitization Exposure Route
 No data available.

Ingredient Sensitization Data

Skin Sensitization Exposure Route

If available, see data below.

Respiratory Sensitization Exposure Route

If available, see data below.

Chronic Toxicity Information

Product Specific Target Organ Toxicity Repeat Dose Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
Inhalation (Gas) Exposure Route
Inhalation (Gas) Exposure Route
Inhalation (Gas) Exposure Route
No data available.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

Oral Exposure Route
Dermal Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
If available, see data below
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below

Product Carcinogenicity Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
No data available
No data available
No data available

Ingredient Carcinogenicity Data

Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
Sodium phosphate dibasic	7558-79-4)#
Salt of	(=)		:=	E	13 1
N,N-Diethyl-p-Phenylenedi					
amine					
Disodium EDTA	139-33-3	-		=	U.=.

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply
NTP (National Toxicology Program)	Does not apply
OSHA (Occupational Safety and Health Administration of the US Department of	Does not apply
Labor)	

Oral Exposure Route
Dermal Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
If available, see data below
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route

EN / AGHS Page 9/15



Product Code(s) 1407099 Issue Date 25-Apr-2018

Version 8.400001

Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 10 / 15

Product Germ Cell Mutagenicity invitro Data

No data available.

Ingredient Germ Cell Mutagenicity invitro Data

If available, see data below

Chemical name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Disodium EDTA (1 - 5%) CAS#: 139-33-3	Cytogenetic analysis	Hamster lung	200 mg/L	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)

Product Germ Cell Mutagenicity invivo Data

Oral Exposure Route No data available **Dermal Exposure Route** No data available Inhalation (Dust/Mist) Exposure Route No data available Inhalation (Vapor) Exposure Route No data available Inhalation (Gas) Exposure Route No data available

Ingredient Germ Cell Mutagenicity invivo Data

Oral Exposure Route If available, see data below **Dermal Exposure Route** If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Reproductive Toxicity Data

Oral Exposure Route No data available No data available **Dermal Exposure Route** Inhalation (Dust/Mist) Exposure Route No data available Inhalation (Vapor) Exposure Route No data available Inhalation (Gas) Exposure Route No data available

Ingredient Reproductive Toxicity Data

Oral Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

12. ECOLOGICAL INFORMATION

Ecotoxicity

Product Ecological Data

Aquatic toxicity

No data available Fish No data available Crustacea No data available Algae

Ingredient Ecological Data

Aquatic toxicity

Fish	If available	see ind	gredient data below

Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Disodium EDTA	96 hours	Lepomis macrochirus	LC ₅₀	159 mg/L	Vendor SDS

EN / AGHS Page 10/15



Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 11 / 15

(1 - 5%) CAS#: 139-33-3					
Crustacea	*	If av	ailable, see i	ngredient data k	pelow
Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Salt of N,N-Diethyl-p-Phenyl enediamine (1 - 5%) CAS#: -	48 Hours	Daphina magna	EC50	10.8 mg/L	Internal Data
Algae		If av	ailable, see i	ngredient data k	pelow
Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Disodium EDTA (1 - 5%) CAS#: 139-33-3	72 Hours	None reported	EC50	10 mg/L	Vendor SDS

Other Information

Persistence and degradability

Product Biodegradability Data

No data available.

Ingredient Biodegradability Data

Chemical name	Test method	Biodegradation	Exposure time	Results
Salt of N,N-Diethyl-p-Phenyl enediamine (1 - 5%) CAS#: -	None reported	None reported	None reported	Not determined

Bioaccumulation

Product Bioaccumulation Data

No data available.

Partition Coefficient (n-octanol/water)

log Kow ~ 0

Ingredient Bioaccumulation Data

Chemical name	Test method	Exposure time	Species	Bioconcentrat ion factor (BCF)	Results
Salt of N,N-Diethyl-p-Phenyl enediamine (1 - 5%) CAS#: -	None reported	None reported	None reported	None reported	Not determined

Mobility

Soil Organic Carbon-Water Partition Coefficient

log K₀c ~ 0

Water solubility

EN / AGHS Page 11/15



Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 12/15

Water solubility classification	<u>Water solubility</u>	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Other adverse effects

No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused

products

Dispose of in accordance with local regulations. Dispose of waste in accordance with

environmental legislation.

Contaminated packaging Do not reuse empty containers.

14. TRANSPORT INFORMATION

U.S. DOTNot regulatedIATAIMDGNot regulatedNot regulated

Note: No special precautions necessary.

Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods.

If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories

TSCA Complies DSL/NDSL Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EINECS/ELINCS Complies **ENCS** Complies **IECSC** Complies Complies KECL **PICCS** Complies TCSI Complies AICS Complies NZIoC Complies

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

EN / AGHS Page 12/15



Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 13 / 15

ENCS - Japan Existing and New Chemical Substances IECSC - China Inventory of Existing Chemical Substances KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substances Inventory AICS - Australian Inventory of Chemical Substances NZIoC - New Zealand Inventory of Chemicals

US Federal Regulations

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

RA 311/312 Hazaiu Categories	
Acute health hazard	Yes
Chronic Health Hazard	No
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sodium phosphate dibasic 7558-79-4	5000 lb	SH.	-	Х

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Sodium phosphate dibasic	5000 lb		RQ 5000 lb final RQ
7558-79-4			RQ 2270 kg final RQ

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

New Jersey Trade Secret Registry Number 80100131-5001 (Carboxylate Salt) New Jersey Trade Secret Registry Number 80100131-5002 (DPD Salt) New York Trade Secret Registry Number 478 (DPD Salt) New York Trade Secret Registry Number 479 (Carboxylate Salt) This product complies with Pennsylvania Trade Secret Regulations. This product is registered as a trade secret in the state of Illinois. This product is registered as a trade secret in the state of Massachusetts. This product is registered as a trade secret in the state of New York.

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Sodium phosphate dibasic	X	X	X

EN / AGHS	Page 13/15

LA-UR-19-22215



Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 14 / 15

7558-79-4		

U.S. EPA Label Information

Chemical name	FIFRA	FDA
Sodium phosphate dibasic	180.0910	21 CFR 182.1778,21 CFR 182.6290,21
		CFR 182.6778,21 CFR 182.8778
Disodium EDTA	180.0940	12

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Special Comments

None

Additional information

Global Automotive Declarable Substance List (GADSL)

Not applicable

NFPA and HMIS Classifications

NFPA	Health hazards - 2	Flammability - 0	Instability - 0	Physical and Chemical Properties -
HMIS	Health hazards - 2	Flammability - 0	Physical Hazards - 0	Personal protection - X
				- See section 8 for more
				information

Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH Immediately Dangerous to Life or Health

ACGIH (American Conference of Governmental Industrial Hygienists)

NDF no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)

MAC Maximum Allowable Concentration Ceiling Ceiling Limit Value

X Listed Vacated These values have no official status. The only

binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state

regulations.

SKN*Skin designationSKN+Skin sensitizationRSP+Respiratory sensitization**Hazard DesignationCCarcinogenRReproductive toxicant

M mutagen

Prepared By Hach Product Compliance Department

 Issue Date
 25-Apr-2018

 Revision Date
 25-Apr-2018

EN / AGHS Page 14/15



Product Name DPD Free Chlorine Reagent **Revision Date** 25-Apr-2018

Page 15 / 15

Revision Note None

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY©2018

End of Safety Data Sheet

EN / AGHS Page 15/15



HACH 2076053





SAFETY DATA SHEET

Issue Date 25-Jul-2016 Revision Date 10-Aug-2016 Version 4 Page 1/20

1. IDENTIFICATION

Product identifier

Product Name Molybdovanadate Reagent

Other means of identification Product Code(s)

2076053 6776102

Safety data sheet number M00297

UN3264 UN/ID no

Component of Kits or Sets 001-H00462.88

Recommended use of the chemical and restrictions on use

Recommended Use Indicator for phosphate.

Uses advised against None. Restrictions on use None.

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company P.O.Box 389 Loveland, CO 80539 USA (970) 669-3050

Emergency telephone number

(303) 623-5716 - 24 Hour Service (515)232-2533 - 8am - 4pm CST

Product Information

Chemical Name Not applicable Formula Not applicable CAS No Not applicable Alternate CAS Number Not applicable NIOSH (RTECS) Number None reported

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Corrosive to metals	Category 1
Acute toxicity - Inhalation (Dusts/Mists)	Category 4
Skin corrosion/irritation	Category 1 Sub-category A
Serious eye damage/eye irritation	Category 1
Specific target organ toxicity (single exposure)	Category 2
Specific target organ toxicity (repeated exposure)	Category 1



Product Name Molybdovanadate Reagent Revision Date 10-Aug-2016 Page 2/20

Hazards not otherwise classified (HNOC)

Data insufficient for GHS classification but significant enough for mention suggests:

CANCER HAZARD. STRONG INORGANIC ACID MISTS CONTAINING SULFURIC ACID CAN CAUSE CANCER.

Inhalation of low concentrations of sulfuric acid may result in airway irritation such as cough and shortness of breath; high concentrations may result in acute effects such as cough.

Label elements

Signal word - Danger



Hazard statements

- H290 May be corrosive to metals
- H332 Harmful if inhaled
- H314 Causes severe skin burns and eye damage
- H371 May cause damage to organs
- H372 Causes damage to organs through prolonged or repeated exposure

Precautionary statements

- P234 Keep only in original container
- P260 Do not breathe dust/fume/gas/mist/vapors/spray
- P264 Wash face, hands and any exposed skin thoroughly after handling
- P270 Do not eat, drink or smoke when using this product
- P271 Use only outdoors or in a well-ventilated area
- P280 Wear protective gloves/protective clothing/eye protection/face protection
- P310 Immediately call a POISON CENTER or doctor/physician
- P312 Call a POISON CENTER or doctor/physician if you feel unwell
- P363 Wash contaminated clothing before reuse
- P390 Absorb spillage to prevent material damage
- P301 + P330 + P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting
- P303 + P361 + P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
- P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
- P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to
- do. Continue rinsing
- P405 Store locked up
- P406 Store in corrosive resistant stainless steel container with a resistant inliner
- P501 Dispose of contents/ container to an approved waste disposal plant

Other Information

Harmful to aquatic life

3. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Substance</u>

Not applicable

Mixture

Chemical Family Mixture.



Product Name Molybdovanadate Reagent Revision Date 10-Aug-2016

Page 3/20

Percent ranges are used where confidential product information is applicable.

Chemical Name	CAS No	Percent Range	HMRIC#
Sulfuric acid	7664-93-9	30 - 50	-
Molybdate (Mo7O246-), hexaammonium	12027-67-7	1 - 5	=
Molybdate (MoO42-), dihydrogen, (T-4)-	7782-91-4	1 - 5	=
Ammonium vanadate	7803-55-6	0.1 - 1	-

4. FIRST AID MEASURES

Description of first aid measures

See section 8 for PPE that may be required during handling. Do not breathe General advice

dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible). If no local exhaust use approved fume hood and/or respirator. If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician. Remove from exposure, lie down. Immediate medical attention is required. IF IN EYES: Flush eyes for at least 15 minutes. IF ON SKIN (or hair): Remove/Take off immediately all

contaminated clothing. Rinse skin with water/shower.

Eye contact In the case of contact with eyes, rinse immediately with plenty of water and seek medical

advice. Remove contact lenses, if present and easy to do. Continue rinsing. Immediate

medical attention is required.

Skin contact IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin

with water/shower. Immediately flush skin with plenty of water for at least 15 (30 or 60) minutes. Immediate medical attention is required. Call a physician immediately. Removal of solidified molten material from skin requires medical assistance. In case of contact with Hydrogen fluoride, anhydrous (UN1052), flush skin and eyes with water for 5 minutes; then, for skin exposures rub on a calcium/jelly combination; for eyes flush with a water/calcium solution for 15 minutes. Remove and isolate contaminated clothing and shoes. Wash

contaminated clothing before reuse.

Inhalation IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for

breathing. Call a POISON CENTER or doctor if you feel unwell.

IF SWALLOWED: Rinse Mouth. Do NOT induce vomiting. Call a physician immediately. Ingestion

Self-protection of the first aider First aider: Pay attention to self-protection. Use personal protective equipment as required.

Avoid contact with skin, eyes or clothing. Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way

valve or other proper respiratory medical device.

Most important symptoms and effects, both acute and delayed

Symptoms See Section 11: TOXICOLOGICAL INFORMATION.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

LA-UR-19-22215 Attachment E E-48 of 208



Product Name Molybdovanadate Reagent **Revision Date** 10-Aug-2016

Page 4/20

Dry chemical.

Unsuitable extinguishing media Do NOT use water.

Flammable properties

During a fire, irritating and highly toxic gases may be generated by thermal decomposition. Contact with metals may evolve flammable hydrogen gas.

Specific hazards arising from the chemical

The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating and toxic gases and vapors. In the event of fire and/or explosion do not breathe furnes.

Hazardous combustion products

Ammonia. nitrogen oxides. Sulfur oxides.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

U.S. Notice Only persons properly qualified to respond to an emergency involving hazardous

substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations

should respond to a spill involving chemicals.

EC Notice Only persons properly qualified to respond to an emergency involving hazardous

substances should respond to a spill involving chemicals. See Section 13, Special

Instructions for disposal assistance.

WHMIS Notice Only persons properly qualified to respond to an emergency involving hazardous

substances should respond to a spill involving chemicals. See Section 13, Special

Instructions for disposal assistance.

Personal precautions, protective equipment and emergency procedures

Personal precautions Evacuate personnel to safe areas. Remove all sources of ignition. Do not touch or walk

through spilled material. Ventilate affected area. Use personal protective equipment as

required

For emergency responders

Use personal protection recommended in Section 8.

Environmental precautions

Environmental precautions Avoid release to the environment. See Section 12 for additional ecological information.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so. Dike far ahead of liquid spill for later

isposal.

Methods for cleaning up Take necessary precautions in observance of pertinent physical hazards. Neutralize spill if

necessary. Soak up with inert absorbent material. Take up mechanically, placing in appropriate containers for disposal. Clean contaminated surface thoroughly. Dispose of in

accordance with local, state and federal regulations or laws.

Emergency Response Guide Number

7. HANDLING AND STORAGE

Precautions for safe handling

Attachment E

E-50 of 208



Product Code(s) 2076053 Issue Date 25-Jul-2016

Revision Date 10-Aug-2016 Version 4 Page 5/20

Use personal protective equipment as required. Avoid contact with skin, eyes or clothing. Advice on safe handling

Do not breathe dust/fume/gas/mist/vapors/spray.

Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Keep out of the reach of **Storage Conditions**

children. Keep in properly labeled containers. Keep/store only in original container.

Product Name Molybdovanadate Reagent

Flammability class Not applicable

Incompatible materials Oxidizers. Metals. Strong acids. Strong bases. Incompatible with strong acids and bases.

Incompatible with oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

	Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
	Sulfuric acid	TWA: 0.2 mg/m ³	TWA: 1 mg/m ³	IDLH: 15 mg/m ³
	30 - 50		(vacated) TWA: 1 mg/m ³	TWA: 1 mg/m ³
M	olybdate (Mo7O246-),	TWA: 0.5 mg/m ³	TWA: 5 mg/m ³	IDLH: 1000 mg/m³ Mo
	hexaammonium	996	(vacated) TWA: 5 mg/m ³	874
	1 - 5			
Molybo	date (MoO42-), dihydrogen,	TWA: 0.5 mg/m ³	TWA: 5 mg/m ³	IDLH: 1000 mg/m³ Mo
	(T-4)-	~	(vacated) TWA: 5 mg/m ³	4 -
	1 - 5			
1	Ammonium vanadate	NDF	NDF	Ceiling: 0.05 mg/m ³ V dust
	0.1 - 1			and fume 15 min

Chemical Name	Alberta OEL	British Columbia OEL	Manitoba OEL	New Brunswick OEL	New Foundland & Labrador OEL
Sulfuric acid 30 - 50	TWA: 1 mg/m ³ STEL: 3 mg/m ³	TWA: 0.2 mg/m ³	TWA: 0.2 mg/m ³	TWA: 1 mg/m ³ STEL: 3 mg/m ³	TWA: 0.2 mg/m ³
Molybdate (Mo7O246-), hexaammonium 1 - 5	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 5 mg/m ³	TWA: 0.5 mg/m ³
Molybdate (MoO42-), dihydrogen, (T-4)- 1 - 5	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 5 mg/m ³	TWA: 0.5 mg/m ³

Chemical Name	Northwest	Nova Scotia OEL	Nunavut OEL	Ontario TWA	Prince Edward
	Territories OEL				Island OEL
Sulfuric acid	TWA: 0.2 mg/m ³	TWA: 0.2 mg/m ³	TWA: 0.2 mg/m ³	TWA: 0.2 mg/m ³	TWA: 0.2 mg/m ³
30 - 50	STEL: 0.6 mg/m ³		STEL: 0.6 mg/m ³		
Molybdate (Mo7O246-),	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³
hexaammonium	STEL: 1.5 mg/m ³	===	STEL: 1.5 mg/m ³		***
1 - 5	305				
Molybdate (MoO42-),	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³
dihydrogen, (T-4)-	STEL: 1.5 mg/m ³	1,=0	STEL: 1.5 mg/m ³		875
1 - 5					

Chemical Name	Quebec OEL	Saskatchewan OEL	Yukon OEL
Sulfuric acid	TWA: 1 mg/m ³	TWA: 0.2 mg/m ³	STEL: 1 mg/m ³
30 - 50	STEL: 3 mg/m ³	STEL: 0.6 mg/m ³	TWA: 1 mg/m ³
Molybdate (Mo7O246-),	TWA: 5 mg/m ³	TWA: 0.5 mg/m ³	STEL: 10 mg/m ³
hexaammonium 1 - 5		STEL: 1.5 mg/m ³	TWA: 5 mg/m ³

LA-UR-19-22215



Product Code(s) 2076053 Issue Date 25-Jul-2016

Version 4

Product Name Molybdovanadate Reagent

Revision Date 10-Aug-2016

Page 6/20

Molybdate (MoO42-), dihydrogen,	TWA: 5 mg/m ³	TWA: 0.5 mg/m ³	STEL: 10 mg/m ³
(T-4)-	2002	STEL: 1.5 mg/m ³	TWA: 5 mg/m ³
1 - 5			

Other Information Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962

(11th Cir., 1992).

Legend See section 16 for terms and abbreviations

Appropriate engineering controls

Engineering Controls If no local exhaust use approved fume hood or self-contained breathing apparatus

If no local exhaust use approved fume hood and/or respirator

Showers

Eyewash stations

Individual protection measures, such as personal protective equipment

Avoid contact with eyes. Wear tight sealing safety goggles and/or face protection shield. Eye/face protection

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, Skin and body protection

as appropriate, to prevent skin contact.

Do not breathe gas/fumes/vapor/spray. If no local exhaust use approved fume hood and/or Respiratory protection

respirator. In case of inadequate ventilation wear respiratory protection.

Avoid breathing (dust, vapor, mist, gas). Avoid contact with skin, eyes or clothing. Use **General Hygiene Considerations**

personal protective equipment as required. Wear suitable gloves and eye/face protection. Wash face, hands and any exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product. Keep away from food, drink and animal feeding stuffs. Regular cleaning of equipment, work area and clothing is recommended. Handle in accordance with good industrial hygiene and safety practice. Avoid prolonged or repeated

contact with skin. Take off all contaminated clothing and wash it before reuse.

Environmental exposure controls

Do not allow into any sewer, on the ground or into any body of water. Local authorities should be advised if significant spillages cannot be contained.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state Liquid

Gas Under Pressure Not classified according to GHS criteria

Appearance aqueous solution Color yellow

clear

Odor None Odor threshold No data available

Property Values Remarks • Method

No data available Molecular weight

pН < 0.5

~ -33 °C / -27 °F Melting point/freezing point Estimation based on theoretical

calculation

LA-UR-19-22215 Attachment E E-51 of 208



Product Code(s) 2076053 Product Name Molybdovanadate Reagent

Issue Date 25-Jul-2016 Revision Date 10-Aug-2016

Version 4 Page 7/20

Boiling point / boiling range \sim 109 °C / 228 °F Estimation based on theoretical

calculation

Evaporation rate 0.06 (water = 1)

21.827 mm Hg / 2.91 kPa at 25 °C / 77 °F Estimation based on theoretical Vapor pressure

calculation

0.62 (air = 1)Vapor density (air = 1)

Specific gravity (water = 1 / air = 1) 1.375

Partition Coefficient (n-octanol/water) Not applicable

Soil Organic Carbon-Water Partition

Coefficient

Not applicable

No data available

No data available Autoignition temperature No data available Decomposition temperature Dynamic viscosity No data available Kinematic viscosity

Solubility(ies)

Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature	
Soluble	> 1000 mg/L	25 °C / 77 °F	

Solubility in other solvents

Chemical Name	Solubility classification	Solubility	Solubility Temperature_	
Acid	Soluble	> 1000 mg/L	25 °C / 77 °F	

Other Information

Classified as corrosive to metal according to GHS criteria **Metal Corrosivity**

GHS Metal Corrosivity Classification Category 1, H290

Steel Corrosion Rate 286.33 mm/yr / 11.27 in/yr

Aluminum Corrosion Rate

Bulk density Not applicable

Not classified according to GHS criteria. **Explosive properties**

Explosion data During a fire, corrosive and toxic gases may be generated by

thermal decomposition. Not Flammable, but reacts with most

metals to form flammable hydrogen gas.

Upper explosion limit No data available Lower explosion limit No data available

Flammable properties During a fire, irritating and highly toxic gases may be generated

by thermal decomposition. Contact with metals may evolve



Product Code(s) 2076053 Product Name Molybdovanadate Reagent

Revision Date 10-Aug-2016 Issue Date 25-Jul-2016

Version 4 Page 8/20

flammable hydrogen gas.

Flammability Limit in Air

Upper flammability limit: No data available Lower flam mability limit: No data available No data available Flash point

Not classified according to GHS criteria. Oxidizing properties

Reactivity propeties Not classified as self-reactive, pyrophoric, self-heating or emitting

flammable gases in contact with water according to GHS criteria.

10. STABILITY AND REACTIVITY

Reactivity propeties

Not classified as self-reactive, pyrophoric, self-heating or emitting flammable gases in contact with water according to GHS criteria

Chemical stability

Stable under recommended storage conditions.

Special dangers of the product

No information available

Possibility of Hazardous Reactions

No information available

Hazardous polymerization Hazardous polymerization does not occur.

Conditions to avoid

Extreme temperatures. Heating to decomposition. Exposure to air or moisture over prolonged periods. Poor Ventilation.

Incompatible materials

Oxidizers. Metals. Strong acids. Strong bases. Incompatible with strong acids and bases. Incompatible with oxidizing agents.

Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

Explosive properties

Not classified according to GHS criteria. During a fire, corrosive and toxic gases may be generated by thermal decomposition. Not Flammable, but reacts with most metals to form flammable hydrogen gas.

No data available Upper explosion limit Lower explosion limit No data available

Autoignition temperature

No data available

Sensitivity to Static Discharge

None reported

LA-UR-19-22215 Attachment E E-53 of 208



Product Name Molybdovanadate Reagent **Revision Date** 10-Aug-2016

Page 9/20

Sensitivity to Mechanical Impact

None reported

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information	Corrosive to skin. Corrosive to eyes. Harmful by inhalation.		
Inhalation	Causes burns. Corrosive by inhalation. Avoid breathing dust/fume/gas/mist/vapors/spray. Harmful by inhalation.		
Eye contact	Corrosive to the eyes and may cause severe damage including blindness.		
Skin contact	Cause severe skin burns and eye damage.		
Ingestion	Ingestion causes burns of the upper digestive and respiratory tracts.		
Aggravated Medical Conditions	Eye disorders. Skin disorders. Respiratory disorders.		
Toxicologically synergistic products	None known.		
Toxicokinetics, metabolism and distribution	See ingredients information below.		

Chemical Name	Toxicokinetics, metabolism and distribution
Sulfuric acid	The corrosivity of sulfuric acid makes it difficult to asses it's effects on metabolism. Its corrosivity is also the
(30 - 50)	main contributor to acute deaths, therefore it is not classified for acute toxicity.
CAS#: 7664-93-9	

Product Acute Toxicity Data

Oral Exposure Route

Dermal Exposure Route

No data available

Inhalation (Dust/Mist) Exposure Route

No data available

Inhalation (Vapor) Exposure Route

No data available

Inhalation (Gas) Exposure Route

No data available

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)	9,359.00 mg/kg
ATEmix (inhalation-dust/mist)	3.55 mg/L

Ingredient Acute Toxicity Data

Oral Exposure Route

Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Molybdate (Mo7O246-), hexaammonium (1 - 5) CAS#: 12027-67-7	Rat LD₅o	333 mg/kg	None reported	None reported	Vendor SDS
Molybdate (MoO42-), dihydrogen, (T-4)- (1 - 5) CAS#: 7782-91-4	Rat LD50	2689 mg/kg	None reported	None reported	Vendor SDS
Ammonium vanadate (0.1 - 1) CAS#: 7803-55-6	Rat LD50	58.1 mg/kg	None reported	None reported	ChemADVISOR
Chemical Name	Endpoint	Reported	Exposure	Toxicological effects	Key literature references and



Product Name Molybdovanadate Reagent **Revision Date** 10-Aug-2016

Page 10 / 20

	type	dose	time		sources for data
Sulfuric acid (30 - 50) CAS#: 7664-93-9	Rat LD50	2140 mg/kg	None reported	None reported	IUCLID (The International Uniform Chemical Information Database)
Molybdate (Mo7O246-), hexaammonium (1 - 5) CAS#: 12027-67-7	Rat LD ₅₀	354 mg/kg	None reported	None reported	Vendor SDS

Dermal Exposure Route

Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Molybdate (MoO42-), dihydrogen, (T-4)- (1 - 5) CAS#: 7782-91-4	Rat LD50	> 2000 mg/kg	None reported	None reported	IUCLID (The International Uniform Chemical Information Database)
Ammonium vanadate (0.1 - 1) CAS#: 7803-55-6	Rat LD50	2102 mg/kg	None reported	None reported	ChemADVISOR

Inhalation (Dust/Mist) Exposure Route

- 55	minutation (Duobinios) Expedite Heate							
Ĭ	Chemical Name	Endpoint	Reported	Exposure	Toxicological effects	Key literature references and		
		type	dose	time	9622	sources for data		
	Ammonium vanadate	Rat	0.0078 mg/L	4 hours	None reported	ChemADVISOR		
	(0.1 - 1)	LC ₅₀			~			
	CAS#: 7803-55-6							

Inhalation (Vapor) Exposure Route

Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (30 - 50) CAS#: 7664-93-9	Rat LC50	0.510 mg/L	None reported	None reported	LOLI
Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (30 - 50) CAS#: 7664-93-9	Human TD∟∘	0.144 mg/L	4 hours	Lungs, Thorax, or Respiration Dyspnea	RTECS (Registry of Toxic Effects of Chemical Substances)

Inhalation (Gas) Exposure Route

No data available

Product Skin Corrosion/Irritation Data

No data available.

Ingredient Skin Corrosion/Irritation Data

Chemical Name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sulfuric acid (30 - 50) CAS#: 7664-93-9	Existing human experience	Human	None reported	None reported	Corrosive to skin	HSDB (Hazardous Substances Data Bank)

<u>Product Serious Eye Damage/Eye Irritation Data</u> No data available.

Ingredient Eye Damage/Eye Irritation Data



Product Name Molybdovanadate Reagent

Revision Date 10-Aug-2016

Page 11 / 20

Chemical Name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sulfuric acid (30 - 50) CAS#: 7664-93-9	Existing human experience	Human	None reported	None reported	Corrosive to eyes	HSDB (Hazardous Substances Data Bank)

Sensitization Information

Product Sensitization Data

Skin Sensitization Exposure Route No data available.

Respiratory Sensitization Exposure Route No data available.

Ingredient Sensitization Data

Skin Sensitization Exposure Route No data available.

Respiratory Sensitization Exposure Route No data available.

Chronic Toxicity Information

Product Repeat Dose Toxicity Data

Oral Exposure Route No data available.

Dermal Exposure Route No data available.

Inhalation (Dust/Mist) Exposure Route No data available.

Inhalation (Vapor) Exposure Route No data available.

Inhalation (Gas) Exposure Route No data available.

Ingredient Repeat Dose Toxicity Data

Oral Exposure Route No data available

Dermal Exposure Route No data available

Inhalation (Dust/Mist) Exposure Route No data available

Inhalation (Vapor) Exposure Route

	Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
ſ	Sulfuric acid	Human	.003 mg/L	168 days	Musculoskeletal	RTECS (Registry of Toxic
ı	(30 - 50) CAS#: 7664-93-9	TC _L o			Changes in teeth and supporting structures	Effects of Chemical Substances)

Inhalation (Gas) Exposure Route

No data available

Chemical Name	CAS No	ACGIH	IARC	NTP	OSHA
Sulfuric acid	7664-93-9	A2	1	X	Х
Molybdate (Mo7O246-), hexaammonium	12027-67-7	A3			·
Molybdate (MoO42-), dihydrogen, (T-4)-	7782-91-4	A3	-	<u>.</u>	



Product Name Molybdovanadate Reagent

Revision Date 10-Aug-2016

Page 12 / 20

Ammonium vanadate	7803-55-6	별	æ	9	(45)

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	A2 - Suspected Human Carcinogen A3 - Animal Carcinogen
IARC (International Agency for Research on Cancer)	Group 1 - Carcinogenic to Humans
NTP (National Toxicology Program)	Known - Known Carcinogen
OSHA (Occupational Safety and Health Administration of the US Department of Labor)	X - Present

Product Carcinogenicity Data

Oral Exposure Route

Dermal Exposure Route

No data available

No data available

Inhalation (Dust/Mist) Exposure Route

No data available

Inhalation (Vapor) Exposure Route

No data available

Inhalation (Gas) Exposure Route

No data available

Inhalation (Gas) Exposure Route

Oral Exposure Route

Dermal Exposure Route

Inhalation (Dust/Mist) Exposure Route

No data available

Inhalation (Vapor) Exposure Route

No data available

Inhalation (Gas) Exposure Route

No data available

Product Germ Cell Mutagenicity invitro Data No data available.

Ingredient Germ Cell Mutagenicity invitro Data

Toxicological data for ingredients is not indicative of likely harm.

Chemical Name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Sulfuric acid (30 - 50) CAS#: 7664-93-9	Cytogenetic analysis	Hamster ovary	4 mmol/L	None reported	Positive test result for mutagenicity	No information available
Ammonium vanadate (0.1 - 1) CAS#: 7803-55-6	DNA damage	Human lymphocyte	0.2 mmol/L	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical Name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Ammonium vanadate (0.1 - 1) CAS#: 7803-55-6	Mutation in mammalian somatic cells	Hamster lung	0.005 mmol/L	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)

Oral Exposure Route

No data available



Product Code(s) 2076053 Product Name Molybdovanadate Reagent

No data available

Issue Date 25-Jul-2016 Revision Date 10-Aug-2016

Version 4 Page 13 / 20

Dermal Exposure Route No data available Inhalation (Dust/Mist) Exposure Route No data available Inhalation (Vapor) Exposure Route No data available

Ingredient Germ Cell Mutagenicity invivo Data

Inhalation (Gas) Exposure Route

Oral Exposure Route No data available No data available **Dermal Exposure Route** Inhalation (Dust/Mist) Exposure Route No data available No data available Inhalation (Vapor) Exposure Route Inhalation (Gas) Exposure Route No data available **Oral Exposure Route** No data available No data available **Dermal Exposure Route** Inhalation (Dust/Mist) Exposure Route No data available No data available Inhalation (Vapor) Exposure Route No data available Inhalation (Gas) Exposure Route

Ingredient Reproductive Toxicity Data

No data available **Oral Exposure Route Dermal Exposure Route** No data available Inhalation (Dust/Mist) Exposure Route No data available

Inhalation (Vapor) Exposure Route

Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (30 - 50) CAS#: 7664-93-9	Rabbit TC∟∘	.02 mg/L	7 hours	Specific Developmental Abnormalities Musculoskeletal system	No information available

No data available Inhalation (Gas) Exposure Route

12. ECOLOGICAL INFORMATION

Ecotoxicity Harmful to aquatic life.

Product Ecological Data

Aquatic toxicity

Fish No data available Crustacea No data available No data available Algae

Terrestrial toxicity

LA-UR-19-22215 Attachment E



Product Code(s) 2076053 Issue Date 25-Jul-2016

Version 4

Product Name Molybdovanadate Reagent

Revision Date 10-Aug-2016

Page 14/20

Soil No data available Vertebrates No data available No data available Invertebrates

Ingredient Ecological Data

Aquatic toxicity

Fish

<u>FISII</u>					
Chemical Name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Molybdate (Mo7O246-), hexaammonium (1 - 5) CAS#: 12027-67-7	96 hours	Oncorhynchus mykiss	LC50	320 mg/L	Vendor SDS
Ammonium vanadate (0.1 - 1) CAS#: 7803-55-6	96 hours	None reported	LC50	2.6 mg/L	EPA (United States Environmental Protection Agency)
Chemical Name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Sulfuric acid (30 - 50) CAS#: 7664-93-9	96 hours	Lepomis macrochirus	LC50	> 16 mg/L	IUCLID (The International Uniform Chemical Information Database)
Ammonium vanadate (0.1 - 1) CAS#: 7803-55-6	144 hours	Poecilia reticulata	LC50	1.5 mg/L	EPA (United States Environmental Protection Agency)

Crustacea

Chemical Name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Molybdate (Mo7O246-), hexaammonium (1 - 5) CAS#: 12027-67-7	48 Hours	Daphnia magna	EC ₅₀	140 mg/L	Vendor SDS
Chemical Name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Sulfuric acid (30 - 50) CAS#: 7664-93-9	48 hours	Crangon crangon	EC50	> 70 mg/L	IUCLID (The International Uniform Chemical Information Database)

Algae

Chemical Name	Exposure	Species	Endpoint	Reported	Key literature references and
	time		type	dose	sources for data
Molybdate (Mo7O246-), hexaammonium (1 - 5) CAS#: 12027-67-7	72 Hours	Desmodesmus subspicatus	EC®	41 mg/L	Vendor SDS

Terrestrial toxicity

No data available Soil Vertebrates No data available

LA-UR-19-22215



Product Code(s) 2076053 Issue Date 25-Jul-2016

Version 4

Product Name Molybdovanadate Reagent

Revision Date 10-Aug-2016 Page 15 / 20

Invertebrates No data available

Other Information

Canadian Environmental Protection Act (CEPA) - Domestic Substances List (DSL): Environmentally Hazardous Substances Categorizations						
Chemical Name	Category	Persistent	Bioaccumulation	Inherently Toxic to Aquatic Organisms		
Molybdate (Mo7O246-), hexaammonium (1 - 5) CAS#: 12027-67-7	Inorganics	Yes	No	Yes		
Ammonium vanadate (0.1 - 1) CAS#: 7803-55-6	Inorganics	Yes	No	Yes		

Persistence and degradability

None known.

Product Biodegradability Data

If available, see ingredient data below.

Ingredient Biodegradability Data

Test data reported below

Chemical Name	Test method	Biodegradation	Exposure time	Results
Molybdate (Mo7O246-), hexaammonium (1 - 5) CAS#: 12027-67-7	None reported	None reported	None reported	Readily biodegradable

Bioaccumulation

If available, see ingredient data below.

Product Bioaccumulation Data Test data reported below.

Ingredient Bioaccumulation Data

No data available

Additional information

Product Information

Partition Coefficient (n-octanol/water) Not applicable

Ingredient Information

Chemical Name	Partition Coefficient (n-octanol/water)	Method
Molybdate (MoO42-), dihydrogen, (T-4)-	log K _{ow} = 1.93	Estimation through KOWWIN v1.68 part
(1 - 5)	N=1	of the Estimation Programs Interface
CAS#: 7782-91-4		(EPI) Suite™

Mobility

Mobility in soil: High mobility. If available, see ingredient data below.



Product Code(s) 2076053 Product Name Molybdovanadate Reagent

Issue Date 25-Jul-2016 Revision Date 10-Aug-2016

Version 4 Page 16/20

Product Information

Soil Organic Carbon-Water Partition Coefficient

Not applicable

Ingredient Information

No data available

Additional information

Water solubility

Product Information

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Ingredient Information

Chemical Name	Water solubility classification	Water solubility	Water solubility temperature °C	Water solubility temperature °F
Sulfuric acid (30 - 50) CAS#: 7664-93-9	Soluble	> 1000 mg/L	25 °C	77 °F
Molybdate (Mo7O246-), hexaammonium (1 - 5) CAS#: 12027-67-7	Soluble	> 1000 mg/L	25 °C	77 °F
Molybdate (MoO42-), dihydrogen, (T-4)- (1 - 5) CAS#: 7782-91-4	Slightly soluble	> 0.1 mg/L	25 °C	77 °F
Ammonium vanadate (0.1 - 1) CAS#: 7803-55-6	Moderately soluble	520 mg/L	15 °C	59 °F

Other adverse effects

No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal of wastes Disposal should be in accordance with applicable regional, national and local laws and

regulations.

Contaminated packaging Do not reuse container.

US EPA Waste Number D002, P119

Chemical Name	RCRA	RCRA - Basis for Listing	RCRA - D Series Wastes	RCRA - U Series Wastes
Ammonium vanadate 7803-55-6	P119	s=	-	-

Chemical Name	RCRA - Halogenated Organic Compounds	RCRA - P Series Wastes	RCRA - F Series Wastes	RCRA - K Series Wastes
Ammonium vanadate 7803-55-6	1	P119		-

Special instructions for disposal Dispose of in accordance with federal, state and local regulations.



Product Name Molybdovanadate Reagent **Revision Date** 10-Aug-2016

Page 17 / 20

14. TRANSPORT INFORMATION

DOT

UN/ID no UN3264

Proper shipping name Corrosive Liquid, Acidic, Inorganic, N.O.S.

DOT Technical Name (<45% Sulfuric Acid solution)

Hazard Class 8 Packing Group II Emergency Response Guide 154

Number

TDG

UN/ID no UN3264

Proper shipping name Corrosive Liquid, Acidic, Inorganic, N.O.S.

TDG Technical Name (<45% Sulfuric Acid solution)

Hazard Class 8 Packing Group II

IATA

UN/ID no UN3264

Proper shipping name Corrosive Liquid, Acidic, Inorganic, N.O.S.

IATA Technical Name (<45% Sulfuric Acid solution)

Hazard Class 8
Packing Group II
ERG Code 154

IMDG

UN/ID no UN3264

IMDG Technical Name (<45% Sulfuric Acid solution)

Hazard Class 8
Packing Group | |

Note: No special precautions necessary.

Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods.

If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories

TSCA Complies DSL/NDSL Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EINECS/ELINCS Complies **ENCS** Complies **IECSC** Complies KECL Complies Complies **PICCS** TCSI Complies AICS Complies NZIoC Complies



Product Name Molybdovanadate Reagent

Revision Date 10-Aug-2016

Page 18 / 20

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substances Inventory AICS - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	SARA 313 - Threshold Values %	
Sulfuric acid (CAS #: 7664-93-9)	1.0	
Ammonium vanadate (CAS #: 7803-55-6)	1.0	

SARA 311/312 Hazard Categories

Acute health hazard	Yes
Chronic Health Hazard	Yes
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sulfuric acid 7664-93-9	1000 lb	~ <u>~</u>	-	Х

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Sulfuric acid 7664-93-9	1000 lb	1000 lb	RQ 1000 lb final RQ RQ 454 kg final RQ
Ammonium vanadate 7803-55-6	1000 lb	2	RQ 1000 lb final RQ RQ 454 kg final RQ

U.S. - DEA (Drug Enforcement Administration) List I & List II

Chemical Name	U.S DEA (Drug Enforcement	U.S DEA (Drug Enforcement
	Administration) - List I or Precursor	Administration) - List II or Essential
	Chemicals	Chemicals
Sulfuric acid	Not Listed	50 gallon Export Volume (Exports,
(30 - 50)	Control and Contro	transshipments and international
CAS#: 7664-93-9		transactions to designated countries)

US State Regulations

California Proposition 65

This product contains the following Proposition 65 chemicals



Product Name Molybdovanadate Reagent

Revision Date 10-Aug-2016

Page 19/20

Chemical Name	California Proposition 65	
Sulfuric acid (CAS #: 7664-93-9)	Carcinogen	

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Sulfuric acid 7664-93-9	X	X	Х
Ammonium vanadate 7803-55-6	X	Х	Х

U.S. EPA Label Information

EPA Pesticide Registration Number Not applicable

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

NFPA and HMIS Classifications

NFPA	Health hazards - 0	Flammability - 0	Instability - 0	Physical and Chemical Properties -
HMIS	Health hazards - 0	Flammability - 0	Physical hazards - 0	Personal protection - X - See section 8 for more information

Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH Immediately Dangerous to Life or Health

ACGIH (American Conference of Governmental Industrial Hygienists)

NDF no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)

MAC Maximum Allowable Concentration Ceiling Ceiling Limit Value

X Listed Vacated These values have no official status. The only

binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state

regulations.

SKN*Skin designationSKN+Skin sensitizationRSP+Respiratory sensitization**Hazard DesignationCCarcinogenRReproductive toxicant

M mutagen

Prepared By Hach Product Compliance Department

 Issue Date
 25-Jul-2016

 Revision Date
 10-Aug-2016

Revision Note None



Product Name Molybdovanadate Reagent Revision Date 10-Aug-2016 Page 20 / 20

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY ©2015

End of Safety Data Sheet



HACH 2105669





SAFETY DATA SHEET

Issue Date 30-04-2018 Revision Date Version 5.4 Page 1/17

04-May-2018

1. IDENTIFICATION

Product identifier

Product Name DPD Total Chlorine Reagent

Other means of identification

 Product Code(s)
 2105669

 Safety data sheet number
 M00110

HMRIC# HMIRA Registry Number 9936 Filed 2016-04-11

Recommended use of the chemical and restrictions on use

Recommended Use Laboratory reagent. Indicator for total chlorine.

Uses advised against None. Restrictions on use None.

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

Emergency telephone number

+1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Signal word - Warning



EN / AGHS Page 1/17



Product Name DPD Total Chlorine Reagent Revision Date 04-May-2018 Page 2/17

Hazard statements

H315 - Causes skin irritation

H319 - Causes serious eye irritation

Precautionary statements
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water

P332 + P313 - If skin irritation occurs: Get medical advice/attention

P362 - Take off contaminated clothing and wash before reuse

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P337 + P313 - If eye irritation persists: Get medical advice/attention

Other Hazards Known

May be harmful if swallowed

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable

Mixture

Chemical Family

Mixture.

Percent ranges are used where confidential product information is applicable.

Chemical name	CAS No.	Percent Range	HMRIC#
Sodium phosphate dibasic	7558-79-4	20 - 30%	
Potassium iodide (KI)	7681-11-0	20 - 30%	=
Salt of N,N-Diethyl-p-Phenylenediamine	2	1 - 5%	9
Glycine, N,N-1,2-ethanediylbis[N-(carboxymethyl)-, disodium salt, dihydrate	6381-92-6	<1%	띹

EN / AGHS Page 2/17



Product Name DPD Total Chlorine Reagent

Revision Date 04-May-2018

Page 3/17

4. FIRST AID MEASURES

Description of first aid measures

General advice Show this safety data sheet to the doctor in attendance.

Inhalation Remove to fresh air. Get medical attention immediately if symptoms occur.

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep

eye wide open while rinsing. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists. Do not rub affected area.

Skin contact Wash off immediately with soap and plenty of water for at least 15 minutes. Get medical

attention if irritation develops and persists.

Ingestion Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth

to an unconscious person. Do NOT induce vomiting. Call a physician.

Self-protection of the first aider Avoid contact with skin, eyes or clothing.

Most important symptoms and effects, both acute and delayed

Symptoms Burning sensation.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media Use extinguishing measures that are appropriate to local circumstances and the

surrounding environment.

Unsuitable Extinguishing Media Caution: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the

chemical

No information available.

Hazardous combustion products Carbon monoxide, Carbon dioxide. Iodine compounds. Phosphorus oxides. Potassium

oxides. Sodium monoxide. Nitrogen oxides.

Special protective equipment for

fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout

gear.

6. ACCIDENTAL RELEASE MEASURES

U.S. Notice Only persons properly qualified to respond to an emergency involving hazardous

substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and

guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Outside of the US, only persons properly qualified according to state or local regulations

should respond to a spill involving chemicals.

Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal

protective equipment as required.

Other Information Refer to protective measures listed in Sections 7 and 8.

EN / AGHS Page 3/17



Product Name DPD Total Chlorine Reagent Revision Date 04-May-2018

Page 4/17

Environmental precautions

Environmental precautions Prevent further leakage or spillage if safe to do so.

Methods and material for containment and cleaning up

Prevent further leakage or spillage if safe to do so. Methods for containment Pick up and transfer to properly labeled containers. Methods for cleaning up

Clean contaminated objects and areas thoroughly observing environmental regulations. Prevention of secondary hazards

Reference to other sections See section 8 for more information. See section 13 for more information.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with

skin, eyes or clothing. Do not eat, drink or smoke when using this product. Take off

contaminated clothing and wash before reuse.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place.

Flammability class Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Potassium iodide (KI) CAS#: 7681-11-0	TWA: 0.01 ppm	NDF	NDF

Appropriate engineering controls

Engineering Controls Showers

Eyewash stations Ventilation systems.

Individual protection measures, such as personal protective equipment

No protective equipment is needed under normal use conditions. If exposure limits are Respiratory protection

exceeded or irritation is experienced, ventilation and evacuation may be required.

Hand Protection Wear suitable gloves. Impervious gloves.

Eyelface protection If splashes are likely to occur, wear safety glasses with side-shields.

Wear suitable protective clothing. Long sleeved clothing. Skin and body protection

General Hygiene Considerations Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this

product. Avoid contact with skin, eyes or clothing.

EN / AGHS Page 4/17



Product Code(s)2105669Product NameDPD Total Chlorine ReagentIssue Date30-04-2018Revision Date04-May-2018

Version 5.4 Page 5/17

Environmental exposure controls Local authorities should be advised if significant spillages cannot be contained. Do not

allow into any sewer, on the ground or into any body of water.

Thermal hazards None under normal processing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state Solid

AppearancepowderColorWhite to light pinkOdorOdorlessOdor thresholdNo data available

Property Values Remarks • Method

Molecular weight

No data available

PH

No data available

Melting point/freezing point

145 °C / 293 °F

Boiling point / boiling range No data available

 Evaporation rate
 Not applicable

 Vapor pressure
 Not applicable

 Vapor density (air = 1)
 Not applicable

Specific gravity (water = 1 / air = 1) 1.79

Partition Coefficient (n-octanol/water) $\log K_{ow} \sim 0$ Soil Organic Carbon-Water Partition $\log K_{oc} \sim 0$

Coefficient

Autoignition temperature

Decomposition temperature

No data available

No data available

Not applicable

Kinematic viscosity

Not applicable

Solubility(ies)

Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Solubility in other solvents

Chemical Name	Solubility classification	Solubility	Solubility Temperature
None reported	No information available	No data available	No information available

Other Information

Metal Corrosivity

Steel Corrosion Rate0.97 mm/yr / 0.04 in/yrAluminum Corrosion Rate0.15 mm/yr / 0.01 in/yr

EN / AGHS Page 5/17

Product Name DPD Total Chlorine Reagent



Product Code(s) 2105669 Issue Date 30-04-2018

Revision Date 04-May-2018 Version 5.4 Page 6/17

Volatile Organic Compounds (VOC) Content

Not applicable

Chemical name	CAS No.	Volatile organic compounds (VOC) content	CAA (Clean Air Act)
Sodium phosphate dibasic	7558-79-4	No data available	=
Potassium iodide (KI)	7681-11-0	Not applicable	5
Salt of N,N-Diethyl-p-Phenylenediamine	æ	Not applicable	F
Glycine, N,N-1,2-ethanediylbis[N-(carboxymeth yl)-, disodium salt, dihydrate	6381-92-6	Not applicable	-

Explosive properties

No data available Upper explosion limit Lower explosion limit No data available

Flammable properties

Flash point Not applicable

Flammability Limit in Air

Upper flammability limit: No data available Lower flammability limit: No data available Oxidizing properties No data available.

Particle Size No information available

Particle Size Distribution No information available

10. STABILITY AND REACTIVITY

No data available

Reactivity

Bulk density

Not applicable.

Chemical stability

Stability Stable under normal conditions.

Explosion data

Sensitivity to Mechanical Impact None Sensitivity to Static Discharge None.

Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing

Hazardous polymerization None under normal processing.

Conditions to avoid

Conditions to avoid None known based on information supplied.

Incompatible materials

Incompatible materials Strong acids. Strong bases. Strong oxidizing agents.

EN / AGHS Page 6/17



Product Name DPD Total Chlorine Reagent **Revision Date** 04-May-2018

Page 7/17

Hazardous Decomposition Products

Carbon dioxide. Carbon monoxide. Iodine compounds. Phosphorus oxides. Potassium oxide. Nitrogen oxides.

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information

Inhalation May cause irritation of respiratory tract.

Eye contact Irritating to eyes. Causes serious eye irritation.

Skin contact Causes skin irritation.

Ingestion Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Symptoms Redness. May cause redness and tearing of the eyes.

Aggravated Medical Conditions Skin disorders. Eye disorders.

Toxicologically synergistic None known.

products

Toxicokinetics, metabolism and See ingredients information below.

distribution

Chemical name	Toxicokinetics, metabolism and distribution
Sodium phosphate	Phosphates are widely utilized by cells for metabolism of proteins, fats and carbohydrates.
dibasic	
(20 - 30%)	
CAS#: 7558-79-4	
Potassium iodide (KI)	May cross placenta and be excreted in breast milk. May react synergistically with mercury.
(20 - 30%)	
CAS#: 7681-11-0	
Glycine,	EDTA and related compounds are poorly absorbed by the digestive system.
N,N-1,2-ethanediylbis	
[N-(carboxymethyl)-,	
disodium salt,	
dihydrate	
(<1%)	
CAS#: 6381-92-6	

Product Acute Toxicity Data
Oral Exposure Route

Test data reported below

EN / AGHS Page 7/17



Product Name DPD Total Chlorine Reagent **Revision Date** 04-May-2018

Page 8/17

Endpoint type	Reported dose	Toxicological	Key literature references and sources for data
Rat	4700 mg/kg	effects	Outside testing
LD ₅₀		Behavioral	·
		Flaccid muscle	
		tone	
		Lethargy	
		Prostration	
		Eye	
		Chromodacryorrhe	
		а	
		Ptosis	
		Gastrointestinal	
		Abnormalities of	
		the gastrointestinal	
		tract	
		Diarrhea	
		Liver	
		Abnormalities of	
		the liver	
		Lungs, Thorax,	
		or Respiration	
		Abnormalities of	
		the lungs	
		Dyspnea	
		Red or brown	
		staining of the	
		nose/mouth area	
		Nutritional and	
		Gross Metabolic	
		Soiling of the	
		anogenital area	
		Wetness of the	
		anogenital area	
		Reproductive	
		Skin and	
		Appendages	
Dormal Evacuura		Piloerection	No data available

Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route

No data available No data available No data available No data available

Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

Acute Toxicity Estimations (ATE)

	97/4
ATEmix (oral)	No information available
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	No information available
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

Ingredient Acute Toxicity Data

Oral Exposure Route				If available, see data below	
Chemical name	Endpoint	Reported	Exposure	Toxicological effects	Key literature references and
	type	dose	time	_	sources for data
Potassium iodide (KI)	Rat	2779 mg/kg	None	None reported	RTECS (Registry of Toxic
(20 - 30%)	LD ₅₀		reported		Effects of Chemical
CAS#: 7681-11-0			, and the second		Substances)

EN / AGHS	Page 8/17



Product Name DPD Total Chlorine Reagent Revision Date 04-May-2018

Page 9/17

Salt of N,N-Diethyl-p-Phenyl enediamine (1 - 5%) CAS#: -	Rat LD50	695 mg/kg	None reported	None reported	Outside testing
Glycine, N,N-1,2-ethanediylbis [N-(carboxymethyl)-, disodium salt, dihydrate (<1%) CAS#: 6381-92-6	Rat LD ₅₀	2300 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sodium phosphate dibasic (20 - 30%) CAS#: 7558-79-4	Rat LD50	17000 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Mouse LD50	1000 mg/kg	None reported	None reported	Vendor SDS

Dermai Exposure Ro	ute			If available, see data below	
Chemical name	Endpoint	Reported	Exposure	Toxicological effects	Key literature references and
	type	dose	time		sources for data
Potassium iodide (KI)	Rat	> 2000 mg/kg	None	None reported	ECHA (The European
(20 - 30%)	LD ₅₀	1000 1000	reported	92	Chemicals Agency)
CAS#: 7681-11-0	100 (100 E) (100 E)				

Inhalation (Dust/Mist) Exposure Route
If available, see data below
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below

Product Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route

Dermal Exposure RouteNo data availableInhalation (Dust/Mist) Exposure RouteNo data availableInhalation (Vapor) Exposure RouteNo data availableInhalation (Gas) Exposure RouteNo data available

Ingredient Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium iodide (KI)	Mouse	1862 mg/kg	None	Lungs, Thorax, or	RTECS (Registry of Toxic
(20 - 30%)	LDLo	10000 1000	reported	Respiration	Effects of Chemical
CAS#: 7681-11-0			*	Dyspnea	Substances)

 Dermal Exposure Route
 If available, see data below

 Inhalation (Dust/Mist) Exposure Route
 If available, see data below

 Inhalation (Vapor) Exposure Route
 If available, see data below

 Inhalation (Gas) Exposure Route
 If available, see data below

Aspiration toxicity
If available, see data below

Kinematic viscosity Not applicable

Product Skin Corrosion/Irritation Data

No data available.

Ingredient Skin Corrosion/Irritation Data

If available, see data below

Chemical name | Test method | Species | Reported | Evposure |

Offerrical fiame	restilletillou	Opecies	Reported	Lxposure	Results	Ney interacture
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Regulte

LA-UR-19-22215 Attachment E

Key literature



Product Name DPD Total Chlorine Reagent Revision Date 04-May-2018

Page 10 / 17

			dose	time		references and sources for data
Sodium phosphate dibasic (20 - 30%) CAS#: 7558-79-4	Standard Draize Test	Rabbit	500 mg	24 hours	Skin irritant	RTECS (Registry of Toxic Effects of Chemical Substances)
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Standard Draize Test	Rabbit	None reported	None reported	Skin irritant	Vendor SDS
Glycine, N,N-1,2-ethanediylbis [N-(carboxymethyl)-, disodium salt, dihydrate (<1%) CAS#: 6381-92-6	Standard Draize Test	Rabbit	500 mg	20 hours	Not corrosive or irritating to skin	ECHA (The European Chemicals Agency)

Product Serious Eye Damage/Eye Irritation Data

No data available.

Ingredient Eye Damage/Eye Irritation Data

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sodium phosphate dibasic (20 - 30%) CAS#: 7558-79-4	Standard Draize Test	Rabbit	500 mg	24 hours	Eye irritant	RTECS (Registry of Toxic Effects of Chemical Substances)
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Standard Draize Test	Rabbit	None reported	24 hours	Eye irritant	Vendor SDS
Glycine, N,N-1,2-ethanediylbis [N-(carboxymethyl)-, disodium salt, dihydrate (<1%) CAS#: 6381-92-6	Standard Draize Test	Rabbit	50 mg	None reported	Mild eye irritant	ECHA (The European Chemicals Agency)

Sensitization Information

Product Sensitization Data

Skin Sensitization Exposure Route Respiratory Sensitization Exposure Route No data available. No data available.

Ingredient Sensitization Data

Skin Sensitization Exposure Route If available, see data below.

Chemical name	Test method	Species	Results	Key literature references and sources for data
Potassium iodide (KI) (20 - 30%)	Patch test	Human	Not confirmed to be a skin sensitizer	ERMA (New Zealands Environmental Risk Management Authority)
CAS#: 7681-11-0				

Respiratory Sensitization Exposure Route

If available, see data below.

Chronic Toxicity Information

Product Specific Target Organ Toxicity Repeat Dose Data

 Oral Exposure Route
 No data available.

 Dermal Exposure Route
 No data available.

EN / AGHS Page 10/17



Product Code(s) 2105669

Product Name DPD Total Chlorine Reagent

Issue Date 30-04-2018 Revision Date 04-May-2018

Version 5.4 Page 11 / 17

Inhalation (Dust/Mist) Exposure RouteNo data available.Inhalation (Vapor) Exposure RouteNo data available.Inhalation (Gas) Exposure RouteNo data available.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

Oral Exposure Route If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Rat NOAEL	0.5 mg/kg	90 days	None reported	ECHA (The European Chemicals Agency)

Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below

Product Carcinogenicity Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
Inhalation (Gas) Exposure Route
No data available
No data available

Ingredient Carcinogenicity Data

Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
Sodium phosphate dibasic	7558-79-4			-	0,0
Potassium iodide (KI)	7681-11-0	-		-	5.00
Salt of		Ā	. 		100
N,N-Diethyl-p-Phenylenedi					
amine					
Glycine,	6381-92-6	=	-	-	.=
N,N-1,2-ethanediylbis[N-(c					
arboxymethyl)-, disodium					
salt, dihydrate					

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply
NTP (National Toxicology Program)	Does not apply
OSHA (Occupational Safety and Health Administration of the US Department of	Does not apply
Labor)	

Oral Exposure Route
Dermal Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
If available, see data below
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route

Product Germ Cell Mutagenicity invitro Data

No data available.

Ingredient Germ Cell Mutagenicity invitro Data

If available, see data below

Chemical name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Cytogenetic analysis	Rat ascites tumor	500 mg/kg	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical

EN / AGHS Page 11 / 17



Product Name DPD Total Chlorine Reagent

Revision Date 04-May-2018

Page 12 / 17

	_					Substances)
Glycine, N,N-1,2-ethanediylbis [N-(carboxymethyl)-, disodium salt, dihydrate (<1%) CAS#: 6381-92-6	Cytogenetic analysis	Hamster lung	200 mg/L	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)

Product Germ Cell Mutagenicity invivo Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route

Ingredient Germ Cell Mutagenicity invivo Data

Oral Exposure Route

Dermal Exposure Route

If available, see data below
Inhalation (Dust/Mist) Exposure Route
If available, see data below
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route

Product Reproductive Toxicity Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
Inhalation (Gas) Exposure Route
No data available
No data available

Ingredient Reproductive Toxicity Data

Oral Exposure Route If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium iodide (KI)		2700 mg/kg	39 weeks	Specific Developmental Abnormalities	RTECS (Registry of Toxic Effects of Chemical
(20 - 30%) CAS#: 7681-11-0	TDLo			Endocrine System	Substances)
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Human TD∟∘	3240 mg/kg	39 weeks	Effects on Newborn Other neonatal measures or effects Physical Specific Developmental Abnormalities Endocrine system	RTECS (Registry of Toxic Effects of Chemical Substances)

 Inhalation (Dust/Mist) Exposure Route
 If available, see data below

 Inhalation (Vapor) Exposure Route
 If available, see data below

 Inhalation (Gas) Exposure Route
 If available, see data below

12. ECOLOGICAL INFORMATION

Ecotoxicity Not considered to be harmful to aquatic life

Product Ecological Data

Aquatic toxicity

Fish No data available Crustacea No data available

EN / AGHS Page 12/17



Product Name DPD Total Chlorine Reagent

Revision Date 04-May-2018 Page 13 / 17

Algae No data available

Ingredient Ecological Data

Aquatic toxicity

Fish		If available, see ingredient data below							
Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data				
Glycine, N,N-1,2-ethanediylbis [N-(carboxymethyl)-, disodium salt, dihydrate (<1%) CAS#: 6381-92-6	96 hours	Lepomis macrochirus	LC50	159 mg/L	Vendor SDS				

Crustacea		lf available, see ingredient data below						
Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data			
Salt of N,N-Diethyl-p-Phenyl enediamine (1 - 5%) CAS#: -	48 Hours	Daphina magna	EC50	10.8 mg/L	Internal Data			

Algae If			∕ailable, see i	ngredient data l	pelow
Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Glycine, N,N-1,2-ethanediylbis [N-(carboxymethyl)-, disodium salt, dihydrate (<1%) CAS#: 6381-92-6		None reported	EC50	10 mg/L	Vendor SDS

Other Information

Persistence and degradability

Product Biodegradability Data

No data available.

Ingredient Biodegradability Data

Chemical name	Test method	Biodegradation	Exposure time	Results
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Inorganic Salt	None reported	None reported	Not readily biodegradable
Salt of N,N-Diethyl-p-Phenyl enediamine (1 - 5%) CAS#: -	None reported	None reported	None reported	Not determined

Bioaccumulation

Product Bioaccumulation Data

No data available.

EN / AGHS Page 13/17



Product Code(s) 2105669 Issue Date 30-04-2018

Version 5.4

Product Name DPD Total Chlorine Reagent

Revision Date 04-May-2018 Page 14 / 17

log Kow ~ 0

Ingredient Bioaccumulation Data

Partition Coefficient (n-octanol/water)

Chemical name	Test method	Exposure time	Species	Bioconcentrat ion factor (BCF)	Results
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	None reported	None reported	None reported	None reported	Not determined
Salt of N,N-Diethyl-p-Phenyl enediamine (1 - 5%) CAS#: -	None reported	None reported	None reported	None reported	Not determined
Glycine, N,N-1,2-ethanediylbis [N-(carboxymethyl)-, disodium salt, dihydrate (<1%) CAS#: 6381-92-6	None reported	None reported	None reported	None reported	Not determined

Mobility

Soil Organic Carbon-Water Partition Coefficient

log Koc ~ 0

Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Other adverse effects

No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

products

Waste from residues/unused

Dispose of in accordance with local regulations. Dispose of waste in accordance with

environmental legislation.

Contaminated packaging Do not reuse empty containers.

14. TR	ANSP	ORT	INFO	RMATION

 U.S. DOT
 Not regulated

 TDG
 Not regulated

 IATA
 Not regulated

 IMDG
 Not regulated

EN / AGHS Page 14 / 17



Product Code(s) 2105669 Product Name DPD Total Chlorine Reagent

Issue Date 30-04-2018 Revision Date 04-May-2018

Version 5.4 Page 15 / 17

Note: No special precautions necessary.

Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods.

If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories

TSCA Complies DSL/NDSL Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EINECS/ELINCS Complies **ENCS** Complies **IECSC** Complies **KECL** Complies Complies **PICCS** TCSI Complies **AICS** Complies Complies **NZIoC**

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances TCSI - Taiwan Chemical Substances Inventory

AICS - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

Acute health hazard	Yes
Chronic Health Hazard	No
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sodium phosphate	5000 lb	1-	-	Х
dibasic				
7558-79-4		,		

EN / AGHS Page 15/17

LA-UR-19-22215



Product Name DPD Total Chlorine Reagent Revision Date 04-May-2018 Page 16 / 17

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Sodium phosphate dibasic 7558-79-4	5000 lb	-	RQ 5000 lb final RQ RQ 2270 kg final RQ

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

New Jersey Trade Secret Registry Number 80100131-5001 (Carboxylate Salt) New Jersey Trade Secret Registry Number 80100131-5002 (DPD Salt) New York Trade Secret Registry Number 478 (DPD Salt) New York Trade Secret Registry Number 479 (Carboxylate Salt) This product complies with Pennsylvania Trade Secret Regulations. This product is registered as a trade secret in the state of Massachusetts. This product is registered as a trade secret in the state of New York.

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Sodium phosphate dibasic 7558-79-4	X	X	X

U.S. EPA Label Information

Chemical name	FIFRA	FDA
Sodium phosphate dibasic	180.0910	21 CFR 182.1778,21 CFR 182.6290,21 CFR 182.6778,21 CFR 182.8778
Potassium iodide (KI)	180.0940	21 CFR 184.1634

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Special Comments

None

Additional information

Global Automotive Declarable Substance List (GADSL) Not applicable

NFPA and HMIS Classifications

	NFPA	Health hazards - 2	Flammability - 0	Instability - 0	Physical and Chemical Properties -
	HMIS	Health hazards - 2	Flammability - 0	Physical Hazards - 0	Personal protection - X - See section 8 for more
ı					information

Key or legend to abbreviations and acronyms used in the safety data sheet

EN / AGHS	Page 16/17



Product Code(s) 2105669 Issue Date 30-04-2018

Issue Date 30-04-2018 Version 5.4 Product Name DPD Total Chlorine Reagent

Revision Date 04-May-2018

Page 17 / 17

NIOSH IDLH Immediately Dangerous to Life or Health

ACGIH (American Conference of Governmental Industrial Hygienists)

NDF no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)

MAC Maximum Allowable Concentration Ceiling Ceiling Limit Value

X Listed Vacated These values have no official status. The only

binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state

regulations.

SKN* Skin designation SKN+ Skin sensitization
RSP+ Respiratory sensitization ** Hazard Designation
C Carcinogen R Reproductive toxicant
M mutagen

Prepared By Hach Product Compliance Department

 Issue Date
 30-04-2018

 Revision Date
 04-May-2018

Revision Note None

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY©2018

End of Safety Data Sheet

EN / AGHS Page 17 / 17



HACH 2263411





SAFETY DATA SHEET

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018 Version 7.1 Page 1/15

1. IDENTIFICATION

Product identifier

Product Name Total Chlorine Indicator

Other means of identification

Product Code(s) 2263411

Safety data sheet number M00469

UN/ID no UN2796

Recommended use of the chemical and restrictions on use

Recommended Use Laboratory Use. Total chlorine analyzer reagent.

Uses advised against No information available.

Restrictions on use Not applicable.

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

Emergency telephone number

+1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Corrosive to metals	Category 1	
Skin corrosion/irritation	Category 2	
Serious eye damage/eye irritation	Category 1	

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Signal word - Danger

EN / AGHS Page 1/15



Product Code(s) 2263411 Issue Date 17-Apr-2018 Version 7.1 Product Name Total Chlorine Indicator Revision Date 17-Apr-2018 Page 2/15



Hazard statements

H290 - May be corrosive to metals

H315 - Causes skin irritation

H318 - Causes serious eye damage

Precautionary statements

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P302 + P352 - IF ON SKIN: Wash with plenty of soap and water

P332 + P313 - If skin irritation occurs: Get medical advice/attention

P362 - Take off contaminated clothing and wash before reuse

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P310 - Immediately call a POISON CENTER or doctor/physician

P234 - Keep only in original container

P390 - Absorb spillage to prevent material damage

Other Hazards Known

Not applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable

Mixture

Chemical Family Mixture.

Chemical nature Inorganic acid in aqueous solution.

Percent ranges are used where confidential product information is applicable.

Chemical name	CAS No.	Percent Range	HMRIC#
Sulfuric acid	7664-93-9	5 - 10%	

EN / AGHS Page 2/15



Product Code(s) 2263411 Issue Date 17-Apr-2018

 Issue Date
 17-Apr-2018

 Version
 7.1

 Revision
 2 / 15

4. FIRST AID MEASURES

Description of first aid measures

General advice Show this safety data sheet to the doctor in attendance. Immediate medical attention is

required.

Inhalation Remove to fresh air. Get medical attention immediately if symptoms occur.

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Remove contact lenses, if present and easy to do. Continue rinsing. Keep eye wide open

Product Name Total Chlorine Indicator

while rinsing. Do not rub affected area. Get immediate medical advice/attention.

Skin contact Wash off immediately with soap and plenty of water for at least 15 minutes. Get medical

attention if irritation develops and persists.

Ingestion Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth

to an unconscious person. Do NOT induce vomiting. Call a physician.

Self-protection of the first aider Avoid contact with skin, eyes or clothing.

Most important symptoms and effects, both acute and delayed

Symptoms Burning sensation.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media Use extinguishing measures that are appropriate to local circumstances and the

surrounding environment.

Unsuitable Extinguishing Media Caution: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the

chemical

No information available.

Hazardous combustion products May emit toxic and corrosive fumes.

Special protective equipment for

fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout

gear.

6. ACCIDENTAL RELEASE MEASURES

U.S. Notice Only persons properly qualified to respond to an emergency involving hazardous

substances may respond to a spill according to federal regulations (OSHA 29 CFR

1910.120(a)(v)) and per your company's emergency response plan and

guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations

should respond to a spill involving chemicals.

Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal

protective equipment as required.

Other Information Refer to protective measures listed in Sections 7 and 8.

EN / AGHS Page 3/15



Product Code(s) 2263411 Issue Date 17-Apr-2018

Version 7.1

Product Name Total Chlorine Indicator

Revision Date 17-Apr-2018

Page 4/15

Environmental precautions

Environmental precautions Prevent further leakage or spillage if safe to do so.

Methods and material for containment and cleaning up

Methods for containmentPrevent further leakage or spillage if safe to do so.Methods for cleaning upPick up and transfer to properly labeled containers.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

Reference to other sections See section 8 for more information. See section 13 for more information.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with

skin, eyes or clothing. Do not eat, drink or smoke when using this product. Take off

contaminated clothing and wash before reuse.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from

moisture. Store locked up. Keep out of the reach of children. Store away from other

materials.

Flammability class Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Sulfuric acid	TWA: 0.2 mg/m ³	TWA: 1 mg/m ³	IDLH: 15 mg/m ³
CAS#: 7664-93-9		(vacated) TWA: 1 mg/m ³	TWA: 1 mg/m ³

Appropriate engineering controls

Engineering Controls Showers

Eyewash stations Ventilation systems.

Individual protection measures, such as personal protective equipment

Respiratory protection No protective equipment is needed under normal use conditions. If exposure limits are

exceeded or irritation is experienced, ventilation and evacuation may be required.

Hand Protection Wear suitable gloves. Impervious gloves.

Eye/face protection Tight sealing safety goggles.

Skin and body protection Wear suitable protective clothing. Long sleeved clothing.

General Hygiene Considerations Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this

product. Regular cleaning of equipment, work area and clothing is recommended. Avoid

EN / AGHS Page 4/15



Product Code(s) 2263411 Issue Date 17-Apr-2018 Version 7.1

Product Name Total Chlorine Indicator Revision Date 17-Apr-2018

Page 5/15

contact with skin, eyes or clothing.

Environmental exposure controls Local authorities should be advised if significant spillages cannot be contained. Do not

allow into any sewer, on the ground or into any body of water.

Thermal hazards None under normal processing.

9. CHEMICAL PROPERTIES PHYSICAL AND

Information on basic physical and chemical properties

Physical state

Liquid

Appearance aqueous solution Odor None

Color colorless Odor threshold Not applicable

Property Values Remarks • Method

Molecular weight Not applicable

< 0.5 pН

Melting point/freezing point ~ -1 °C / 30.2 °F Estimation based on theoretical

calculation

Boiling point / boiling range ~ 100 °C / 212 °F @ 100 °C Estimation based on

theoretical calculation

Evaporation rate 0.81 (water = 1)

Vapor pressure 0.075 mm Hg / 0.01 kPa at 25 °C / 77 °F

Estimation based on theoretical

calculation

Vapor density (air = 1) 0.03 (air = 1)

Specific gravity (water = 1 / air = 1) 1.056

Partition Coefficient (n-octanol/water) Not applicable Soil Organic Carbon-Water Partition Not applicable

Coefficient

Autoignition temperature No data available Decomposition temperature No data available No data available Dynamic viscosity Kinematic viscosity No data available

Solubility(ies)

Water solubility

Water solubility classification	Water solubility_	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Solubility in other solvents

Chemical Name	Solubility classification	Solubility	Solubility Temperature
Acid	Soluble	> 1000 mg/L	25 °C / 77 °F

EN / AGHS Page 5/15



Product Code(s) 2263411 Product Name Total Chlorine Indicator

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 7.1 Page 6/15

Other Information

Metal Corrosivity

Classified as corrosive to metal according to GHS criteria

Steel Corrosion Rate19.62 mm/yr / 0.77 in/yrAluminum Corrosion Rate7.37 mm/yr / 0.29 in/yr

Volatile Organic Compounds (VOC) Content

Chemical name	CAS No.	Volatile organic compounds (VOC) content	CAA (Clean Air Act)
Sulfuric acid	7664-93-9	No data available	=

Explosive properties

Upper explosion limit No data available Lower explosion limit No data available

Flammable properties

Flash point No data available

Flammability Limit in Air

Upper flammability limit:
Lower flammability limit:
No data available
No data available
No data available.

No data available.

Bulk density
Not applicable

Particle Size No information available

Particle Size Distribution No information available

10. STABILITY AND REACTIVITY

Reactivity

Not applicable.

Chemical stability

Stability Stable under normal conditions.

Explosion data

Sensitivity to Mechanical Impact None Sensitivity to Static Discharge None.

Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing.

Hazardous polymerization

Hazardous polymerization does not occur.

Conditions to avoid

Conditions to avoid Exposure to air or moisture over prolonged periods.

Incompatible materials

Incompatible materials Oxidizing agent. Strong acids. Strong bases.

EN / AGHS Page 6/15



Product Code(s) 2263411 Issue Date 17-Apr-2018 Version 7.1

Product Name Total Chlorine Indicator Revision Date 17-Apr-2018

Page 7/15

Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information

Inhalation May cause irritation of respiratory tract.

Eye contact Severely irritating to eyes. Causes serious eye damage. May cause burns. May cause

irreversible damage to eyes.

Skin contact Causes skin irritation.

Ingestion Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Symptoms Redness. Burning. May cause blindness. May cause redness and tearing of the eyes.

Aggravated Medical Conditions Skin disorders. Eye disorders. Preexisting eye disorders. Respiratory disorders. Teeth.

Toxicologically synergistic

None known.

products

Toxicokinetics, metabolism and See ingredients information below.

distribution

Chemical name	Toxicokinetics, metabolism and distribution
Sulfuric acid	The corrosivity of sulfuric acid makes it difficult to assess its effects on metabolism. Its corrosivity is also the
(5 - 10%)	main contributor to acute deaths, therefore it is not classified for acute toxicity.
CAS#: 7664-93-9	

Product Acute Toxicity Data

No data available **Oral Exposure Route** Dermal Exposure Route No data available Inhalation (Dust/Mist) Exposure Route No data available Inhalation (Vapor) Exposure Route No data available Inhalation (Gas) Exposure Route No data available

Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

Acute Toxicity Estimations (ATE)

ATEmix (oral)	No information available
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	No information available
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

Ingredient Acute Toxicity Data

ngreatent Addit Toxiotty Data								
Oral Exposure Route								
Chemical name Endpoint Reported Exposure Toxicological effects				Key literature references and				
	type	dose	time	_	sources for data			
Sulfuric acid (5 - 10%)	Rat LD50	2140 mg/kg	None reported	None reported	IUCLID (The International Uniform Chemical Information			
CAS# 7664-93-9					Database)			

If available, see data below **Dermal Exposure Route**

EN / AGHS Page 7/15



Product Code(s) 2263411

Issue Date 17-Apr-2018

Version 7.1

Product Name Total Chlorine Indicator

Revision Date 17-Apr-2018

Page 8/15

Inhalation (Dust/Mist) Exposure Route

If available, see data below If available, see data below

Inhalation (Vapor) Exposure Route

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data	
Sulfuric acid (5 - 10%) CAS#: 7664-93-9	Rat LC50	0.510 mg/L	None reported	None reported	LOLI	

Inhalation (Gas) Exposure Route

If available, see data below

Product Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route No data available **Dermal Exposure Route** No data available Inhalation (Dust/Mist) Exposure Route No data available Inhalation (Vapor) Exposure Route No data available Inhalation (Gas) Exposure Route No data available

Ingredient Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route If available, see data below **Dermal Exposure Route** If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid	Human	0.144 mg/L	5 minutes	Lungs, Thorax, or	RTECS (Registry of Toxic
(5 - 10%)	TDLo		100 10000000000000000000000000000000000	Respiration	Effects of Chemical
CAS#: 7664-93-9				Dyspnea	Substances)

Inhalation (Gas) Exposure Route If available, see data below

Aspiration toxicity

If available, see data below

Kinematic viscosity No data available

Product Skin Corrosion/Irritation Data

Test data reported below.

Test method	Species	Reported dose	Exposure	Results	Key literature references and
Organization for	Rabbit	0.5 mL	time	Not corrosive	sources for data
Economic			4 hours	to skin	Outside testing
Co-operation and					
Development					
(OECD) - Test 404:					
Acute Dermal					
Corrosion/Irritation					

Ingredient Skin Corrosion/Irritation Data

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sulfuric acid (5 - 10%) CAS#: 7664-93-9	Existing human experience	Human	None reported	None reported	Corrosive to skin	HSDB (Hazardous Substances Data Bank)

Product Serious Eye Damage/Eye Irritation Data

No data available.

Ingredient Eye Damage/Eye Irritation Data

If available, see data below

sources for data	Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
------------------	---------------	-------------	---------	------------------	------------------	---------	--

EN / AGHS Page 8/15



Product Name Total Chlorine Indicator

Revision Date 17-Apr-2018 Version 7.1

Page 9/15

Sulfuric acid	Existing human	Human	None	None	Corrosive to eyes	HSDB (Hazardous
(5 - 10%)	experience		reported	reported	*	Substances Data
CAS#: 7664-93-9						Bank)

Sensitization Information

Product Sensitization Data

Skin Sensitization Exposure Route No data available Respiratory Sensitization Exposure Route No data available.

Ingredient Sensitization Data

Skin Sensitization Exposure Route If available, see data below. **Respiratory Sensitization Exposure Route** If available, see data below.

Chronic Toxicity Information

Product Specific Target Organ Toxicity Repeat Dose Data

No data available. Oral Exposure Route **Dermal Exposure Route** No data available. Inhalation (Dust/Mist) Exposure Route No data available. Inhalation (Vapor) Exposure Route No data available. Inhalation (Gas) Exposure Route No data available.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

Oral Exposure Route If available, see data below **Dermal Exposure Route** If available, see data below If available, see data below Inhalation (Dust/Mist) Exposure Route Inhalation (Vapor) Exposure Route If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (5 - 10%) CAS#: 7664-93-9	Human TC∟∘	.003 mg/L	168 days	Musculoskeletal Changes in teeth and supporting structures	RTECS (Registry of Toxic Effects of Chemical Substances)

Inhalation (Gas) Exposure Route If available, see data below

Product Carcinogenicity Data

No data available **Oral Exposure Route Dermal Exposure Route** No data available Inhalation (Dust/Mist) Exposure Route No data available Inhalation (Vapor) Exposure Route No data available No data available Inhalation (Gas) Exposure Route

Ingredient Carcinogenicity Data

mgreatene general para				8300		UCO
	Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
	Sulfuric acid	7664-93-9	A2	Group 1	Known	X

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	A2 - Suspected Human Carcinogen
IARC (International Agency for Research on Cancer)	Group 1 - Carcinogenic to Humans
NTP (National Toxicology Program)	Known - Known Carcinogen
OSHA (Occupational Safety and Health Administration of the US Department of	X - Present
Labor)	

Oral Exposure Route If available, see data below **Dermal Exposure Route** If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Germ Cell Mutagenicity invitro Data

EN / AGHS Page 9/15



Version 7.1

Product Name Total Chlorine Indicator

Revision Date 17-Apr-2018 Page 10 / 15

No data available.

Ingredient Germ Cell Mutagenicity invitro Data

If available, see data below

Chemical name	Test	Cell Strain	Reported	Exposure	Results	Key literature
			dose	time		references and
		ļ				sources for data
Sulfuric acid	Cytogenetic	Hamster ovary	4 mmol/L	None	Positive test result for	No information
(5 - 10%)	analysis	**		reported	mutagenicity	available
CAS#: 7664-93-9	\$			33	1000 60	

Product Germ Cell Mutagenicity invivo Data

 Oral Exposure Route
 No data available

 Dermal Exposure Route
 No data available

 Inhalation (Dust/Mist) Exposure Route
 No data available

 Inhalation (Vapor) Exposure Route
 No data available

 Inhalation (Gas) Exposure Route
 No data available

Ingredient Germ Cell Mutagenicity invivo Data

Oral Exposure Route
Dermal Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
If available, see data below
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below

Product Reproductive Toxicity Data

 Oral Exposure Route
 No data available

 Dermal Exposure Route
 No data available

 Inhalation (Dust/Mist) Exposure Route
 No data available

 Inhalation (Vapor) Exposure Route
 No data available

 Inhalation (Gas) Exposure Route
 No data available

Ingredient Reproductive Toxicity Data

Oral Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Vapor) Exposure Route
If available, see data below

Γ	Chemical name	Endpoint	Reported	Exposure	Toxicological effects	Key literature references and
L		type	dose	time		sources for data
Γ	Sulfuric acid	Rabbit	.02 mg/L	7 hours	Specific Developmental	No information available
ı	(5 - 10%)	TC _{Lo}	0007		Abnormalities	
L	CAS#: 7664-93-9				Musculoskeletal system	

Inhalation (Gas) Exposure Route If available, see data below

12. ECOLOGICAL INFORMATION

Ecotoxicity

Product Ecological Data

Aquatic toxicity

Fish No data available Crustacea No data available Algae No data available

Ingredient Ecological Data

Aquatic toxicity

Fish If available, see ingredient data below

EN / AGHS Page 10/15



Version 7.1

Revision Date 17-Apr-2018 Page 11 / 15

If available, see ingredient data below

Product Name Total Chlorine Indicator

No data available

Other Information

Crustacea

Algae

Persistence and degradability

Product Biodegradability Data

No data available.

Ingredient Biodegradability Data

Bioaccumulation

Product Bioaccumulation Data

No data available.

Partition Coefficient (n-octanol/water) Not applicable

Ingredient Bioaccumulation Data

Mobility

Soil Organic Carbon-Water Partition Coefficient

Not applicable

Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Other adverse effects No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused

products

Dispose of in accordance with local regulations. Dispose of waste in accordance with

environmental legislation.

Contaminated packaging Do not reuse empty containers.

D002 US EPA Waste Number

Special instructions for disposal Work in an approved fume hood. Dilute material with excess water making a weaker than

5% solution. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Open cold water tap completely, slowly pour the reacted material to the drain.

Allow cold water to run for 5 minutes to completely flush the system.

14. TRANSPORT INFORMATION

U.S. DOT

UN/ID no UN2796

Sulfuric acid solution Proper shipping name

EN / AGHS Page 11 / 15



Product Code(s) 2263411 Product Name Total Chlorine Indicator

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 7.1 Page 12 / 15

Hazard Class 8 **Packing Group** Ш

Sulfuric acid: RQ kg= 4637.39 Reportable Quantity (RQ) UN2796, Sulfuric acid solution, 8, II Description

Emergency Response Guide 157

Number

TDG

UN/ID no UN2796 Proper shipping name Battery fluid, acid

Hazard Class Packing Group

Description UN2796, Battery fluid, acid, 8, II

IATA

UN/ID no UN2796

Proper shipping name Sulphuric acid solution

Hazard Class 8 Ш **Packing Group ERG Code** 8L

Description UN2796, Sulphuric acid solution, 8, II

IMDG

UN/ID no UN2796 Sulphuric acid Proper shipping name

Hazard Class 8 **Packing Group** П EmS-No F-A. S-B

UN2796, Sulphuric acid, 8, II Description

No special precautions necessary. Note:

Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods.

If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories

TSCA Complies DSL/NDSL Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EINECS/ELINCS Complies Complies **ENCS** Complies **IECSC KECL** Complies **PICCS** Complies TCSI Complies **AICS** Complies **NZIoC** Complies

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

EN / AGHS Page 12/15

LA-UR-19-22215



Product Name Total Chlorine Indicator Revision Date 17-Apr-2018

Page 13 / 15

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substances Inventory AICS - Australian Inventory of Chemical Substances NZIOC - New Zealand Inventory of Chemicals

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical name	SARA 313 - Threshold Values %
Sulfuric acid (CAS #: 7664-93-9)	1.0

SARA 311/312 Hazard Categories

Acute health hazard	Yes
Chronic Health Hazard	Yes
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sulfuric acid 7664-93-9	1000 lb	is.	=	Х

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

Chemical name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Sulfuric acid	1000 lb	1000 lb	RQ 1000 lb final RQ
7664-93-9			RQ 454 kg final RQ

U.S. - DEA (Drug Enforcement Administration) List I & List II

Chemical name	U.S DEA (Drug Enforcement Administration) - List I or Precursor Chemicals	U.S DEA (Drug Enforcement Administration) - List II or Essential Chemicals
Sulfuric acid (5 - 10%) CAS#: 7664-93-9	Not Listed	50 gallon Export Volume (exports, transshipments and international transactions to designated countries)

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

IMERC: Not applicable

EN / AGHS	Page 13/15



Product Name Total Chlorine Indicator Revision Date 17-Apr-2018

Page 14/15

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Sulfuric acid 7664-93-9	X	Х	X

U.S. EPA Label Information

Chemical name	FIFRA	FDA
Sulfuric acid	180.0910	21 CFR 184.1095

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Special Comments

None

Additional information

Global Automotive Declarable Substance List (GADSL)

Not applicable

NFPA and HMIS Classifications

NFPA	Health hazards - 3	Flammability - 0	Instability - 0	Physical and Chemical Properties -
HMIS	Health hazards - 3	Flammability - 0	Physical Hazards - 0	Personal protection - X - See section 8 for more information

Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH Immediately Dangerous to Life or Health

ACGIH (American Conference of Governmental Industrial Hygienists)

NDF no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)

MAC Maximum Allowable Concentration Ceiling Ceiling Limit Value

X Listed Vacated These values have no official status. The only

binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state

regulations.

SKN*Skin designationSKN+Skin sensitizationRSP+Respiratory sensitization**Hazard DesignationCCarcinogenRReproductive toxicant

M mutagen

Prepared By Hach Product Compliance Department

Issue Date 17-Apr-2018

EN / AGHS Page 14/15



Product Code(s) 2263411 Product Name Total Chlorine Indicator

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 7.1 **Page** 15 / 15

Revision Date 17-Apr-2018

Revision Note SDS sections updated

2

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY©2018

End of Safety Data Sheet

EN / AGHS Page 15 / 15



HACH 2263511





SAFETY DATA SHEET

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018 Version 3.2 Page 1/18

1. IDENTIFICATION

Product identifier

Product Name Total Chlorine Buffer Solution

Other means of identification

 Product Code(s)
 2263511

 Safety data sheet number
 M00470

 UN/ID no
 UN1824

Recommended use of the chemical and restrictions on use

Recommended Use Buffer.
Uses advised against None.
Restrictions on use None.

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

Emergency telephone number

+1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Corrosive to metals	Category 1
Skin corrosion/irritation	Category 1
Serious eye damage/eye irritation	Category 1

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Signal word - Danger

EN / AGHS Page 1/18



Product Name Total Chlorine Buffer Solution Revision Date 17-Apr-2018 Page 2/18



Hazard statements

H290 - May be corrosive to metals

H314 - Causes severe skin burns and eye damage

Precautionary statements

P260 - Do not breathe dust/fume/gas/mist/vapors/spray

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting
P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower

P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P310 - Immediately call a POISON CENTER or doctor/physician

P363 - Wash contaminated clothing before reuse

P405 - Store locked up

P501 - Dispose of contents/ container to an approved waste disposal plant

P234 - Keep only in original container

P390 - Absorb spillage to prevent material damage

Other Hazards Known

Not applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable

<u>Mixture</u>

Percent ranges are used where confidential product information is applicable.

Chemical name	CAS No.	Percent Range	HMRIC #
Potassium iodide (KI)	7681-11-0	5 - 10%	3
Sodium hydroxide	1310-73-2	1 - 5%	S -5
Decyl phenoxybenzenedisulfonic acid, disodium salt	36445-71-3	<1%	. 4
Tetrasodium EDTA	64-02-8	<1%	
Benzenesulfonic acid, oxybis[decyl-, disodium salt	70146-13-3	<0.1%	(Ye
Sodium sulfite	7757-83-7	<0.1%	

EN / AGHS Page 2/18



Product Name Total Chlorine Buffer Solution

Revision Date 17-Apr-2018

Page 3/18

4. FIRST AID MEASURES

Description of first aid measures

General advice Show this safety data sheet to the doctor in attendance. Immediate medical attention is

required.

Inhalation Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical

attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. Get immediate medical

advice/attention.

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Remove contact lenses, if present and easy to do. Continue rinsing. Keep eye wide open

while rinsing. Do not rub affected area. Get immediate medical advice/attention.

Wash off immediately with soap and plenty of water while removing all contaminated Skin contact

clothes and shoes. Get immediate medical advice/attention.

Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth Ingestion

to an unconscious person. Do NOT induce vomiting. Get immediate medical

advice/attention.

Avoid contact with skin, eyes or clothing. Ensure that medical personnel are aware of the Self-protection of the first aider

material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid direct contact with skin. Use barrier to give mouth-to-mouth

resuscitation.

Most important symptoms and effects, both acute and delayed

Symptoms Burning sensation.

Indication of any immediate medical attention and special treatment needed

Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Note to physicians

Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood

pressure may occur with moist rales, frothy sputum, and high pulse pressure.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media Use extinguishing measures that are appropriate to local circumstances and the

surrounding environment.

Unsuitable Extinguishing Media Caution: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the chemical

The product causes burns of eyes, skin and mucous membranes. Thermal decomposition

can lead to release of irritating gases and vapors.

Hazardous combustion products lodine compounds. Carbon monoxide, Carbon dioxide.

Special protective equipment for

fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout

gear.

6. ACCIDENTAL RELEASE MEASURES

EN / AGHS Page 3/18



Product Code(s) 2263511 Product Name Total Chlorine Buffer Solution

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 3.2 Page 4/18

U.S. Notice Only persons properly qualified to respond to an emergency involving hazardous

substances may respond to a spill according to federal regulations (OSHA 29 CFR

1910.120(a)(v)) and per your company's emergency response plan and

guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations

should respond to a spill involving chemicals.

Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal

protective equipment as required. Attention! Corrosive material. Evacuate personnel to

safe areas. Keep people away from and upwind of spill/leak.

Other Information Refer to protective measures listed in Sections 7 and 8.

Environmental precautions

Environmental precautions Prevent further leakage or spillage if safe to do so. Should not be released into the

environment. Do not allow to enter into soil/subsoil. Prevent product from entering drains.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Pick up and transfer to properly labeled containers.

Prevention of secondary hazards
Clean contaminated objects and areas thoroughly observing environmental regulations.

Reference to other sections See section 8 for more information. See section 13 for more information.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with

skin, eyes or clothing. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation. Do not eat, drink or smoke when using this product. Take off contaminated

clothing and wash before reuse.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from

moisture. Store locked up. Keep out of the reach of children. Store away from other

materials.

Flammability class Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Potassium iodide (KI) CAS#: 7681-11-0	TWA: 0.01 ppm	NDF	NDF
Sodium hydroxide	Ceiling: 2 mg/m ³	TWA: 2 mg/m ³	IDLH: 10 mg/m ³



Product Name Total Chlorine Buffer Solution Revision Date 17-Apr-2018

Version 3.2

Page 5/18

CAS#: 1310-73-2 (vacated) Ceiling: 2 mg/m3 Ceiling: 2 mg/m³

Appropriate engineering controls

Engineering Controls

Showers Evewash stations

Ventilation systems.

Individual protection measures, such as personal protective equipment

Respiratory protection

No protective equipment is needed under normal use conditions. If exposure limits are

exceeded or irritation is experienced, ventilation and evacuation may be required.

Hand Protection Wear suitable gloves. Impervious gloves.

Eyelface protection Face protection shield.

Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron. Skin and body protection

Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this **General Hygiene Considerations**

product. Regular cleaning of equipment, work area and clothing is recommended. Avoid contact with skin, eyes or clothing. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Contaminated work clothing should not be allowed out of the workplace. Wash hands before breaks and immediately after handling the product.

Local authorities should be advised if significant spillages cannot be contained. Do not Environmental exposure controls

allow into any sewer, on the ground or into any body of water.

None under normal processing. Thermal hazards

PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state

Liquid

Appearance aqueous solution

colorless Color

No data available Odor None Odor threshold

Values Property Remarks • Method

Molecular weight No data available

рΗ 11.9

~ -13 °C / 9 °F Estimation based on theoretical Melting point/freezing point

calculation

106 °C / 223 °F Boiling point / boiling range Evaporation rate 0.61 (water = 1)

Vapor pressure

22.427 mm Hg / 2.99 kPa at 25 °C / 77 °F Estimation based on theoretical

calculation

Vapor density (air = 1) 0.62 (air = 1)

Specific gravity (water = 1 / air = 1) 1 246

Partition Coefficient (n-octanol/water) Not applicable Soil Organic Carbon-Water Partition

Coefficient

Not applicable

EN / AGHS Page 5/18



Product Code(s) 2263511 Product Name Total Chlorine Buffer Solution

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 3.2 Page 6/18

Autoignition temperature

Decomposition temperature

No data available

Solubility(ies)

Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Solubility in other solvents

Chemical Name	Solubility classification	<u>Solubility</u>	Solubility Temperature
Acid	Soluble	> 1000 mg/L	25 °C / 77 °F

Other Information

Metal Corrosivity

Classified as corrosive to metal according to GHS criteria

Steel Corrosion Rate0.25 mm/yr / 0.01 in/yrAluminum Corrosion Rate754.63 mm/yr / 29.71 in/yr

Volatile Organic Compounds (VOC) Content

Chemical name	CAS No.	Volatile organic compounds (VOC) content	CAA (Clean Air Act)
Potassium iodide (KI)	7681-11-0	Not applicable	-
Sodium hydroxide	1310-73-2	No data available	=
Decyl phenoxybenzenedisulfonic acid, disodium salt	36445-71-3	No data available	-
Tetrasodium EDTA	64-02-8	No data available	=
Benzenesulfonic acid, oxybis[decyl-, disodium salt	70146-13-3	No data available	-
Sodium sulfite	7757-83-7	No data available	g.

Explosive properties

Upper explosion limitNo data availableLower explosion limitNo data available

Flammable properties

Flash point No data available

Flammability Limit in Air

Upper flammability limit:
Lower flammability limit:
No data available

Oxidizing properties
No data available.

Bulk density Not applicable

Particle Size No information available

EN / AGHS Page 6/18



Version 3.2

Product Name Total Chlorine Buffer Solution

Revision Date 17-Apr-2018

Page 7/18

Particle Size Distribution No information available

10. STABILITY AND REACTIVITY

Reactivity

Not applicable.

Chemical stability

Stability Stable under normal conditions.

Explosion data

Sensitivity to Mechanical Impact None Sensitivity to Static Discharge None.

Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing.

Hazardous polymerization

None under normal processing.

Conditions to avoid

Conditions to avoid Exposure to air or moisture over prolonged periods.

Incompatible materials

Incompatible materials Oxidizing agent. Acids. Bases.

Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information

Inhalation Corrosive by inhalation. Inhalation of corrosive fumes/gases may cause coughing, choking,

headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs.

Pulmonary edema can be fatal.

Eye contact Causes burns. Corrosive to the eyes and may cause severe damage including blindness.

Causes serious eye damage. May cause irreversible damage to eyes.

Skin contact May cause irritation.

Ingestion Causes burns. Ingestion causes burns of the upper digestive and respiratory tracts. May

cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung

damage if swallowed. May be fatal if swallowed and enters airways

Symptoms 5 4 1 Redness. Burning. May cause blindness. Coughing and/ or wheezing.

Toxicologically synergistic None known.

Aggravated Medical Conditions Eye disorders. Skin disorders. Respiratory disorders. Preexisting eye disorders.

products

Toxicokinetics, metabolism and See ingredients information below.

distribution

Page 7/18 EN / AGHS



Product Name Total Chlorine Buffer Solution

Revision Date 17-Apr-2018

Page 8/18

Chemical name	Toxicokinetics, metabolism and distribution
, ,	May cross placenta and be excreted in breast milk. May react synergistically with mercury.
(5 - 10%) CAS#: 7681-11-0	

Product Acute Toxicity Data
Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route

No data available No data available No data available No data available

No data available

Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

Acute Toxicity Estimations (ATE)

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)	34,608.00 mg/kg
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	No information available
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

Ingredient Acute Toxicity Data

Oral Exposure Route	_			If available, see data below			
Chemical name	Chemical name Endpoint Re		Exposure time	Toxicological effects	Key literature references and sources for data		
Potassium iodide (KI) (5 - 10%) CAS#: 7681-11-0	Rat LD50	2779 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)		
Decyl phenoxybenzenedisul fonic acid, disodium salt (<1%) CAS#: 36445-71-3	Rat LD50	1000 mg/kg	None reported	None reported	EPA (United States Environmental Protection Agency)		
Tetrasodium EDTA (<1%) CAS#: 64-02-8	Rat LD50	1658 mg/kg	None reported	None reported	ERMA (New Zealands Environmental Risk Management Authority)		
Sodium sulfite (<0.1%) CAS#: 7757-83-7	Rat LD50	3560 mg/kg	None reported	None reported	GESTIS (Information System on Hazardous Substances of the German Social Accident Insurance)		
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data		
Potassium iodide (KI) (5 - 10%) CAS#: 7681-11-0	Mouse LD50	1000 mg/kg	None reported	None reported	Vendor SDS		
Sodium hydroxide (1 - 5%) CAS#: 1310-73-2	Rabbit LD50	500 mg/kg	None reported	None reported	No information available		
Dermal Exposure Ro	ute			If available, see data below			
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data		

EN / AGHS Page 8/18

None reported

None

Rabbit

2000 mg/kg

Decyl

EPA (United States



Product Name Total Chlorine Buffer Solution

Revision Date 17-Apr-2018

Page 9/18

phenoxybenzenedisul fonic acid, disodium salt (<1%) CAS#: 36445-71-3	LD50		reported		Environmental Protection Agency)
Sodium sulfite (<0.1%) CAS#: 7757-83-7	Rat LD50	2000 mg/kg	None reported	None reported	EPA (United States Environmental Protection Agency)
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium iodide (KI) (5 - 10%) CAS#: 7681-11-0	Rat LD50	> 2000 mg/kg	None reported	None reported	ECHA (The European Chemicals Agency)
Sodium hydroxide (1 - 5%) CAS#: 1310-73-2	Rabbit LD50	1350 mg/kg	None reported	None reported	IUCLID (The International Uniform Chemical Information Database)
Inhalation (Dust/Mist) Exposure Re	oute		If available, see data below	~
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sodium sulfite (<0.1%) CAS#: 7757-83-7	Rat LC50	5.5 mg/L	4 hours	None reported	ECHA (The European Chemicals Agency)

Inhalation (Vapor) Exposure Route Inhalation (Gas) Exposure Route

If available, see data below If available, see data below

Product Specific Target Organ Toxicity Single Exposure Data

No data available **Oral Exposure Route Dermal Exposure Route** No data available Inhalation (Dust/Mist) Exposure Route No data available Inhalation (Vapor) Exposure Route No data available Inhalation (Gas) Exposure Route No data available

Ingredient Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route If available, see data below							
and the second s		Reported	·		Key literature references and		
	type	dose	time		sources for data		
Potassium iodide (KI)	Mouse	1862 mg/kg	None	Lungs, Thorax, or	RTECS (Registry of Toxic		
(5 - 10%)	LD∟∘		reported	Respiration	Effects of Chemical		
CAS#: 7681-11-0			·	Dyspnea	Substances)		

Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Aspiration toxicity No data available

Product Skin Corrosion/Irritation Data

No data available.

Ingredient Skin Corrosion/Irritation Data

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Potassium iodide (KI) (5 - 10%) CAS#: 7681-11-0	Standard Draize Test	Rabbit	None reported	None reported	Skin irritant	Vendor SDS
Sodium hydroxide (1 - 5%)	Patch test	Human	20 mg	24 hours	Corrosive to skin	RTECS (Registry of Toxic Effects of

Page 9/18 EN / AGHS



Product Name Total Chlorine Buffer Solution **Revision Date** 17-Apr-2018

Page 10 / 18

CAS#: 1310-73-2						Chemical Substances)
Decyl phenoxybenzenedisul fonic acid, disodium salt (<1%) CAS#: 36445-71-3	None reported	Rabbit	None reported	None reported	Skin irritant	No information available
Sodium sulfite (<0.1%) CAS#: 7757-83-7	Standard Draize Test	Rabbit	500 mg	4 hours	Not corrosive or irritating to skin	ECHA (The European Chemicals Agency)

Product Serious Eye Damage/Eye Irritation Data

No data available.

Ingredient Eye Damage/Eye Irritation Data

If available, see data below

n available, see data below							
Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data	
Potassium iodide (KI) (5 - 10%) CAS#: 7681-11-0	Standard Draize Test	Rabbit	None reported	24 hours	Eye irritant	Vendor SDS	
Sodium hydroxide (1 - 5%) CAS#: 1310-73-2	Standard Draize Test	Rabbit	0.05 mg	24 hours	Corrosive to eyes	RTECS (Registry of Toxic Effects of Chemical Substances)	
Decyl phenoxybenzenedisul fonic acid, disodium salt (<1%) CAS#: 36445-71-3	None reported	Rabbit	None reported	None reported	Corrosive to eyes	No information available	
Sodium sulfite (<0.1%) CAS#: 7757-83-7	Standard Draize Test	Rabbit	162 mg	None reported	Mild eye irritant	ECHA (The European Chemicals Agency)	

Sensitization Information

Product Sensitization Data

Skin Sensitization Exposure Route Respiratory Sensitization Exposure Route No data available. No data available.

Ingredient Sensitization Data

Skin Sensitization Exposure Route If available, see data below.

ORINI CONSTRUCTOR EX	on Exposure iteate			
Chemical name	Test method	Species	Results	Key literature references and sources for data
Potassium iodide (KI)	Patch test	Human	Not confirmed to be a skin sensitizer	ERMA (New Zealands Environmental
(5 - 10%) CAS#: 7681-11-0				Risk Management Authority)

Respiratory Sensitization Exposure Route If available, see data below.

Chemical name Test method Species Results

Chemical name	Test method	Species	Results	Key literature references and sources for data
Sodium sulfite (<0.1%) CAS#: 7757-83-7	Based on human experience	Human	Confirmed to be a respiratory sensitizer	OECD (Organization for Economic Co-operation and Development)

Chronic Toxicity Information

Product Specific Target Organ Toxicity Repeat Dose Data

 Oral Exposure Route
 No data available.

 Dermal Exposure Route
 No data available.

EN / AGHS Page 10 / 18



Product Name Total Chlorine Buffer Solution

Revision Date 17-Apr-2018

Version 3.2

Page 11/18

Inhalation (Dust/Mist) Exposure Route No data available. Inhalation (Vapor) Exposure Route No data available. Inhalation (Gas) Exposure Route No data available.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

Oral Exposure Route If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium iodide (KI) (5 - 10%) CAS#: 7681-11-0	Rat NOAEL	0.5 mg/kg	90 days	None reported	ECHA (The European Chemicals Agency)

Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Carcinogenicity Data

Oral Exposure Route No data available **Dermal Exposure Route** No data available Inhalation (Dust/Mist) Exposure Route No data available Inhalation (Vapor) Exposure Route No data available Inhalation (Gas) Exposure Route No data available

Ingredient Carcinogenicity Data

Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
Potassium iodide (KI)	7681-11-0		-	-)
Sodium hydroxide	1310-73-2	-	:=	-	-
Decyl	36445-71-3	=			0.5
phenoxybenzenedisulfonic acid, disodium salt					
Tetrasodium EDTA	64-02-8	-	3 	-	×=
Benzenesulfonic acid, oxybis[decyl-, disodium salt	70146-13-3	E		-	45
Sodium sulfite	7757-83-7	A	Group 3	ē	353

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply
NTP (National Toxicology Program)	Does not apply
OSHA (Occupational Safety and Health Administration of the US Department of	Does not apply
Labor)	COM 1/2

Oral Exposure Route If available, see data below If available, see data below **Dermal Exposure Route** Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Germ Cell Mutagenicity invitro Data

No data available

Ingredient Germ Cell Mutagenicity invitro Data

If available, see data below

Chemical name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Potassium iodide (KI)	Cytogenetic	Rat ascites tumor	500 mg/kg	None	Positive test result for	RTECS (Registry
(5 - 10%)	analysis			reported	mutagenicity	of Toxic Effects of

EN / AGHS Page 11/18



Version 3.2

Product Name Total Chlorine Buffer Solution

Revision Date 17-Apr-2018

Page 12/18

CAS#: 7681-11-0						Chemical
(21,221,1,221,1,22						Substances)
Sodium sulfite	Cytogenetic	Mouse sperm cells	25 mg/L	None	Positive test result for	
(<0.1%)	analysis			reported	mutagenicity	of Toxic Effects of
CAS#: 7757-83-7	20.			50	5000 60	Chemical
55.00						Substances)
Chemical name	Test	Cell Strain	Reported	Exposure	Results	Key literature
			dose	time		references and
						sources for data
Sodium sulfite	None reported	Human	0.1 mmol/L	None	Positive test result for	RTECS (Registry
(<0.1%)	Ö	lymphocyte		reported	mutagenicity	of Toxic Effects of
CAS#: 7757-83-7						Chemical
					l	Substances)

Product Germ Cell Mutagenicity invivo Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
No data available
No data available
No data available

Ingredient Germ Cell Mutagenicity invivo Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below

Product Reproductive Toxicity Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
Inhalation (Gas) Exposure Route
No data available
No data available

Ingredient Reproductive Toxicity Data

Oral Exposure Route If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium iodide (KI) (5 - 10%) CAS#: 7681-11-0	Human TD∟∘	2700 mg/kg	39 weeks	Specific Developmental Abnormalities Endocrine System	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium iodide (KI) (5 - 10%) CAS#: 7681-11-0	Human TD∟∘	3240 mg/kg	39 weeks	Effects on Newborn Other neonatal measures or effects Physical Specific Developmental Abnormalities Endocrine system	RTECS (Registry of Toxic Effects of Chemical Substances)

 Inhalation (Dust/Mist) Exposure Route
 If available, see data below

 Inhalation (Vapor) Exposure Route
 If available, see data below

 Inhalation (Gas) Exposure Route
 If available, see data below

12. ECOLOGICAL INFORMATION

Ecotoxicity

Product Ecological Data

EN / AGHS Page 12/18



Version 3.2

Product Name Total Chlorine Buffer Solution

Revision Date 17-Apr-2018 Page 13 / 18

Aquatic toxicity

Fish No data available Crustacea No data available Algae No data available

Ingredient Ecological Data

Aquatic toxicity

Fish		If a	vailable, see i	ngredient data l	below
Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Sodium hydroxide (1 - 5%) CAS#: 1310-73-2	96 hours	Oncorhynchus mykiss	LC50	45.4 mg/L	IUCLID (The International Uniform Chemical Information Database)
Decyl phenoxybenzenedisul fonic acid, disodium salt (<1%) CAS#: 36445-71-3	96 hours	None reported	LC50	3 mg/L	No information available
Sodium sulfite (<0.1%) CAS#: 7757-83-7	96 hours	Leuciscus idus	LC50	170 mg/L	OECD (Organization for Economic Co-operation and Development)
Crustacea		If a	vailable see i	ngredient data l	helow

Crustacea		if available, see ingredient data below				
Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data	
Sodium hydroxide (1 - 5%) CAS#: 1310-73-2	48 Hours	Daphnia sp.	EC50	40.4 mg/L	IUCLID (The International Uniform Chemical Information Database)	
Sodium sulfite (<0.1%) CAS#: 7757-83-7	48 Hours	Daphnia magna	EC50	18 mg/L	OECD (Organization for Economic Co-operation and Development)	
Alase		If a	i aas aldelier	naredient data k	nelow.	

Algae	ii avallable, see ingredient data below				
Chemical name	Exposure	Species	Endpoint	Reported	Key literature references and
	time	,	type	dose	sources for data
Sodium sulfite	None	Chlamydomonas reinhardtii	EC50	63 mg/L	OECD (Organization for
(<0.1%)	reported				Economic Co-operation and
CAS#: 7757-83-7	~				Development)

Other Information

Persistence and degradability

Product Biodegradability Data

No data available.

Ingredient Biodegradability Data

Chemical name	Test method	Biodegradation	Exposure time	Results
Potassium iodide (KI) (5 - 10%) CAS#: 7681-11-0	Inorganic Salt	None reported	None reported	Not readily biodegradable
Sodium hydroxide (1 - 5%) CAS#: 1310-73-2	None reported	None reported	None reported	Readily biodegradable

EN / AGHS Page 13/18



Product Code(s) 2263511 Product Name Total Chlorine Buffer Solution

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 3.2 Page 14/18

Bioaccumulation

Product Bioaccumulation Data

No data available.

Not applicable Partition Coefficient (n-octanol/water)

Ingredient Bioaccumulation Data

Chemical name	Test method	Exposure time	Species	Bioconcentrat ion factor (BCF)	Results
Potassium iodide (KI) (5 - 10%) CAS#: 7681-11-0	None reported	None reported	None reported	None reported	Not determined

Mobility

Soil Organic Carbon-Water Partition Coefficient Not applicable

Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Other adverse effects

Contains a substance with an endocrine-disrupting potential.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused products

Dispose of in accordance with local regulations. Dispose of waste in accordance with

environmental legislation.

Contaminated packaging Do not reuse empty containers.

US EPA Waste Number D002

Special instructions for disposal Work in an approved fume hood. Dilute to 3 to 5 times the volume with cold water. Adjust to

a pH between 6 and 9 with an acid, such as sulfuric or citric. Open cold water tap completely, slowly pour the reacted material to the drain. Allow cold water to run for 5

minutes to completely flush the system.

14. TRANSPORT INFORMATION

U.S. DOT

UN/ID no UN1824

Proper shipping name Sodium Hydroxide Solution

Hazard Class 8 **Packing Group** П **Emergency Response Guide** 154

Number

TDG

EN / AGHS Page 14 / 18



Product Code(s) 2263511 Product Name Total Chlorine Buffer Solution

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 3.2 Page 15/18

UN/ID no UN1824

Proper shipping name Sodium Hydroxide Solution

Hazard Class 8
Packing Group

IATA

UN/ID no UN1824

Proper shipping name Sodium Hydroxide Solution

Hazard Class 8
Packing Group II
ERG Code 154

IMDG

UN/ID no UN1824

Proper shipping name Sodium Hydroxide Solution

Hazard Class 8
Packing Group

Note: No special precautions necessary.

Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods.

If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories

TSCA Complies DSL/NDSL Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EINECS/ELINCS Complies **ENCS** Does not comply **IECSC** Complies KECL Complies **PICCS** Complies Complies **TCSI** Complies **AICS** NZIoC Does not comply

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substances Inventory AICS - Australian Inventory of Chemical Substances NZIOC - New Zealand Inventory of Chemicals

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

EN / AGHS Page 15/18



Version 3.2

Product Name Total Chlorine Buffer Solution

Revision Date 17-Apr-2018

Page 16 / 18

SARA 311/312 Hazard Categories

Acute health hazard Yes
Chronic Health Hazard Yes
Fire hazard No
Sudden release of pressure hazard No
Reactive Hazard No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sodium hydroxide 1310-73-2	1000 lb	V-	-	Х

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

Chemical name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Sodium hydroxide	1000 lb	(#S	RQ 1000 lb final RQ
1310-73-2			RQ 454 kg final RQ

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Sodium hydroxide	Χ	Х	Х
1310-73-2			

U.S. EPA Label Information

Chemical name	FIFRA	FDA
Potassium iodide (KI)	180.0940	21 CFR 184.1634
Sodium hydroxide	180.0910	21 CFR 184.1763
Decyl phenoxybenzenedisulfonic acid, disodium salt	180.0910	-
Tetrasodium EDTA	180.0910	<u>u</u>
Benzenesulfonic acid, oxybis[decyl-, disodium salt	180.0910	-
Sodium sulfite	180.0910	21 CFR 182.3798

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

EN / AGHS	Page 16/18



Version 3.2

Product Name Total Chlorine Buffer Solution

Revision Date 17-Apr-2018 Page 17 / 18

Special Comments

None

Additional information

Global Automotive Declarable Substance List (GADSL)

Chemical name	Global Automotive Declarable Substance List Classifications	Global Automotive Declarable Substance List Thersholds
Sodium sulfite	Prohibited Substance (LR)	0.0 %
7757-83-7	Declarable Substance (LR)	

NFPA and HMIS Classifications

NFPA	Health hazards - 3	Flammability - 0	Instability - 0	Physical and Chemical Properties -
HMIS	Health hazards - 3	Flammability - 0	Physical Hazards - 0	Personal protection - X
				- See section 8 for more information

Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH Immediately Dangerous to Life or Health

ACGIH (American Conference of Governmental Industrial Hygienists)

NDF no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)

MAC Maximum Allowable Concentration Ceiling Ceiling Limit Value

X Listed Vacated These values have no official status. The only

binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state

regulations.

SKN* Skin designation SKN+ Skin sensitization
RSP+ Respiratory sensitization ** Hazard Designation
C Carcinogen R Reproductive toxicant
M mutagen

Prepared By Hach Product Compliance Department

 Issue Date
 17-Apr-2018

 Revision Date
 17-Apr-2018

Revision Note None

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

EN / AGHS Page 17 / 18



Product Name Total Chlorine Buffer Solution Revision Date 17-Apr-2018 Page 18 / 18

HACH COMPANY@2018

End of Safety Data Sheet

EN / AGHS Page 18/18



HACH 2297255





SAFETY DATA SHEET

Issue Date 12-Oct-2016 Revision Date 17-Apr-2018 Version 4.4 Page 1/14

1. IDENTIFICATION

Product identifier

Product Name DPD Compound for Free and Total Chlorine Analyzers

Other means of identification

Product Code(s) 2297255

Safety data sheet number M01127

Recommended use of the chemical and restrictions on use

Recommended Use Restricted to professional users.

Uses advised against Consumer use

Restrictions on use For Laboratory Use Only.

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

Emergency telephone number

+1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity - Oral	Category 4
Skin corrosion/irritation	Category 1
Serious eye damage/eye irritation	Category 1
Chronic aquatic toxicity	Category 3

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Signal word - Danger



EN / AGHS Page 1/14



Analyzers

Issue Date 12-Oct-2016 Revision Date 17-Apr-2018

Version 4.4 Page 2/14

Hazard statements

H302 - Harmful if swallowed

H314 - Causes severe skin burns and eye damage

H412 - Harmful to aquatic life with long lasting effects

Precautionary statements

P270 - Do not eat, drink or smoke when using this product

P501 - Dispose of contents/ container to an approved waste disposal plant

P260 - Do not breathe dust/fume/gas/mist/vapors/spray

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting

P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower

P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P310 - Immediately call a POISON CENTER or doctor/physician

P363 - Wash contaminated clothing before reuse

P405 - Store locked up

P273 - Avoid release to the environment

Other Hazards Known

Harmful to aquatic life

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Chemical FamilyConfidential.Chemical natureConfidential.

 $\label{lem:percent_ranges} \textbf{Percent ranges are used where confidential product information is applicable.}$

Chemical name	CAS No.	Percent Range	HMRIC#
Salt of N,N-Diethyl-p-Phenylenediamine	¥	100%	=

EN / AGHS Page 2/14



Analyzers

Issue Date 12-Oct-2016 Revision Date 17-Apr-2018

Version 4.4 Page 3/14

4. FIRST AID MEASURES

Description of first aid measures

General advice Show this safety data sheet to the doctor in attendance. Immediate medical attention is

required.

Inhalation Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical

attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. Get immediate medical

advice/attention.

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep

eye wide open while rinsing. Do not rub affected area. Remove contact lenses, if present

and easy to do. Continue rinsing. Get immediate medical advice/attention.

Skin contact Wash off immediately with soap and plenty of water while removing all contaminated

clothes and shoes. Get immediate medical advice/attention.

Ingestion Do NOT induce vomiting. Clean mouth with water and drink afterwards plenty of water.

Never give anything by mouth to an unconscious person. Get immediate medical

advice/attention.

Self-protection of the first aider Ensure that medical personnel are aware of the material(s) involved, take precautions to

protect themselves and prevent spread of contamination. Avoid contact with skin, eyes or clothing. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation.

Most important symptoms and effects, both acute and delayed

Symptoms Burning sensation.

Indication of any immediate medical attention and special treatment needed

Note to physicians Product is a corrosive material. Use of gastric lavage or emesis is contraindicated.

Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood

pressure may occur with moist rales, frothy sputum, and high pulse pressure.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media Use extinguishing measures that are appropriate to local circumstances and the

surrounding environment.

Unsuitable Extinguishing Media Caution: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the

chemical

The product causes burns of eyes, skin and mucous membranes. Thermal decomposition

can lead to release of irritating gases and vapors.

Hazardous combustion products Carbon dioxide (CO2). Carbon monoxide.

Special protective equipment for

fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout

gear.

6. ACCIDENTAL RELEASE MEASURES

EN / AGHS Page 3/14



Analyzers

Revision Date 17-Apr-2018

Version 4.4 Page 4/14

U.S. Notice Only persons properly qualified to respond to an emergency involving hazardous

substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and

guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations

should respond to a spill involving chemicals.

Personal precautions, protective equipment and emergency procedures

Personal precautions Attention! Corrosive material. Avoid contact with skin, eyes or clothing. Ensure adequate

ventilation. Use personal protective equipment as required. Evacuate personnel to safe

areas. Keep people away from and upwind of spill/leak.

Other Information Refer to protective measures listed in Sections 7 and 8.

Environmental precautions

Issue Date 12-Oct-2016

Environmental precautions Prevent further leakage or spillage if safe to do so. Should not be released into the

environment. Do not allow to enter into soil/subsoil. Prevent product from entering drains.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Pick up and transfer to properly labeled containers.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

Reference to other sections See section 8 for more information. See section 13 for more information.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with

skin, eyes or clothing. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation. Do not eat, drink or smoke when using this product. Take off contaminated

clothing and wash before reuse.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Keep out of the reach

of children. Protect from moisture. Store locked up. Store away from other materials.

Flammability class Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines This product, as supplied, does not contain any hazardous materials with occupational

exposure limits established by the region specific regulatory bodies

Appropriate engineering controls

Engineering Controls Showers

EN / AGHS Page 4/14



Analyzers

Revision Date 17-Apr-2018

Version 4.4 Page 5/14

> Eyewash stations Ventilation systems.

Individual protection measures, such as personal protective equipment

No protective equipment is needed under normal use conditions. If exposure limits are Respiratory protection

exceeded or irritation is experienced, ventilation and evacuation may be required.

Hand Protection Wear suitable gloves. Impervious gloves.

Eyelface protection Face protection shield.

Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron. Skin and body protection

General Hygiene Considerations Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Do

not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product.

Environmental exposure controls Local authorities should be advised if significant spillages cannot be contained. Do not

allow into any sewer, on the ground or into any body of water.

Thermal hazards None under normal processing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state

Issue Date 12-Oct-2016

powder white **Appearance** Color

Solid

Odor None Odor threshold Not applicable

Property Values Remarks • Method

164.24 g/mole Molecular weight

5% Solution pН 1 99

Melting point/freezing point 180 °C / 356 °F No data available Boiling point / boiling range **Evaporation rate** Not applicable Vapor pressure Not applicable Vapor density (air = 1) Not applicable

Specific gravity (water = 1 / air = 1) 1.226

Partition Coefficient (n-octanol/water) Partition coefficient Soil Organic Carbon-Water Partition

Coefficient

Dynamic viscosity

No data available

Autoignition temperature No data available No data available Decomposition temperature Not applicable

EN / AGHS Page 5/14



Analyzers

Issue Date 12-Oct-2016 Revision Date 17-Apr-2018

Version 4.4 Page 6/14

Kinematic viscosity Not applicable

Solubility(ies)
Water solubility

Water solubility classification	Water solubility_	Water Solubility Temperature
Completely soluble	> 10000 mg/L	25 °C / 77 °F

Solubility in other solvents

Chemical Name_	Solubility classification	Solubility	Solubility Temperature
None reported	No information available	No data available	No information available

Other Information

Metal Corrosivity

 Steel Corrosion Rate
 Not applicable

 Aluminum Corrosion Rate
 Not applicable

Volatile Organic Compounds (VOC) Content

This Product is by Weight 100% an Individual Pure Chemical Substance

Chemical name	CAS No.	Volatile organic compounds (VOC) content	CAA (Clean Air Act)
Salt of N,N-Diethyl-p-Phenylenediamine	·-	Not applicable	-

Explosive properties

Upper explosion limitNo data availableLower explosion limitNo data available

Flammable properties

Flash point Not applicable

Flammability Limit in Air

Upper flammability limit:No data availableLower flammability limit:No data availableOxidizing propertiesNo data available.

Particle Size No information available

Particle Size Distribution No information available

10. STABILITY AND REACTIVITY

No data available

Reactivity

Bulk density

Not applicable.

Chemical stability

Stability Stable under normal conditions.

EN / AGHS Page 6/14



Analyzers

Issue Date 12-Oct-2016 Revision Date 17-Apr-2018

Version 4.4 Page 7/14

Explosion data

Sensitivity to Mechanical Impact None Sensitivity to Static Discharge None.

Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing.

Hazardous polymerization

Hazardous polymerization does not occur.

Conditions to avoid

Conditions to avoid Exposure to air or moisture over prolonged periods.

Incompatible materials

Incompatible materials Acids. Bases. Oxidizing agent.

Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information

Inhalation Corrosive by inhalation. Inhalation of corrosive fumes/gases may cause coughing, choking,

headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs.

Pulmonary edema can be fatal.

Eye contact Causes burns. Corrosive to the eyes and may cause severe damage including blindness.

Causes serious eye damage. May cause irreversible damage to eyes.

Skin contact May cause irritation.

Ingestion Causes burns. Ingestion causes burns of the upper digestive and respiratory tracts. May

cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung

damage if swallowed. May be fatal if swallowed and enters airways.

Symptoms Redness. Burning. May cause blindness. Coughing and/ or wheezing.

Aggravated Medical Conditions Eye disorders. Toxicologically synergistic None known.

products

Toxicokinetics, metabolism and This Product is by Weight 100% an Individual Pure Chemical Substance.

distribution

Product Acute Toxicity Data This Product is by Weight 100% an Individual Pure Chemical

Substance

Oral Exposure Route

Dermal Exposure Route
If available, see ingredient data below
Inhalation (Dust/Mist) Exposure Route
If available, see ingredient data below
Inhalation (Vapor) Exposure Route
If available, see ingredient data below
Inhalation (Gas) Exposure Route
If available, see ingredient data below
If available, see ingredient data below
If available, see ingredient data below

Unknown Acute Toxicity

EN / AGHS Page 7/14



Analyzers

Issue Date 12-Oct-2016 Revision Date 17-Apr-2018

Version 4.4 Page 8/14

0% of the mixture consists of ingredient(s) of unknown toxicity.

Acute Toxicity Estimations (ATE) Not applicable

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)	No information available
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	No information available
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

Ingredient Acute Toxicity Data

Oral Exposure Route If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Salt of N,N-Diethyl-p-Phenyl enediamine (100%) CAS#: -	Rat LD50	695 mg/kg	None reported	None reported	Outside testing

Dermal Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
If available, see data below
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below

Product Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route
Dermal Exposure Route
If available, see ingredient data below
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
If available, see ingredient data below
Inhalation (Gas) Exposure Route
If available, see ingredient data below
Inhalation (Gas) Exposure Route
If available, see ingredient data below

Ingredient Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below

Aspiration toxicity
If available, see data below

Kinematic viscosity Not applicable

Product Skin Corrosion/Irritation Data

This Product is by Weight 100% an Individual Pure Chemical Substance. If available, see ingredient data below.

Ingredient Skin Corrosion/Irritation Data

If available, see data below

Product Serious Eye Damage/Eye Irritation Data

This Product is by Weight 100% an Individual Pure Chemical Substance. If available, see ingredient data below.

Ingredient Eye Damage/Eye Irritation Data

No data available

Sensitization Information

Product Sensitization Data

Skin Sensitization Exposure Route This Product is by Weight 100% an Individual Pure Chemical

EN / AGHS Page 8/14



Analyzers

Issue Date 12-Oct-2016 Revision Date 17-Apr-2018

Version 4.4 Page 9/14

Substance. If available, see ingredient data below.

Respiratory Sensitization Exposure Route

This Product is by Weight 100% an Individual Pure Chemical

Substance. If available, see ingredient data below.

Ingredient Sensitization Data

Skin Sensitization Exposure Route If available, see data below. Respiratory Sensitization Exposure Route If available, see data below.

Chronic Toxicity Information

Product Specific Target Organ Toxicity Repeat Dose Data

Oral Exposure Route

Dermal Exposure Route

If available, see ingredient data below.
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
If available, see ingredient data below.
Inhalation (Gas) Exposure Route
If available, see ingredient data below.
If available, see ingredient data below.
If available, see ingredient data below.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

Oral Exposure Route
Dermal Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below

Product Carcinogenicity Data

Oral Exposure Route

Dermal Exposure Route

If available, see ingredient data below
Inhalation (Gas) Exposure Route

If available, see ingredient data below
If available, see ingredient data below

Ingredient Carcinogenicity Data

Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
Salt of	181	<u>-</u>	=	<u>=</u>	19
N,N-Diethyl-p-Phenylenedi					
amine					

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply
NTP (National Toxicology Program)	Does not apply
OSHA (Occupational Safety and Health Administration of the US Department of	Does not apply
Labor)	9954 - 62

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below

Product Germ Cell Mutagenicity invitro Data

This Product is by Weight 100% an Individual Pure Chemical Substance. If available, see ingredient data below.

Ingredient Germ Cell Mutagenicity invitro Data

No data available

Product Germ Cell Mutagenicity invivo Data

Oral Exposure Route If available, see ingredient data below Dermal Exposure Route If available, see ingredient data below

EN / AGHS Page 9/14



Analyzers

Issue Date 12-Oct-2016 Revision Date 17-Apr-2018

Version 4.4 Page 10/14

 Inhalation (Dust/Mist) Exposure Route
 If available, see ingredient data below

 Inhalation (Vapor) Exposure Route
 If available, see ingredient data below

 Inhalation (Gas) Exposure Route
 If available, see ingredient data below

Ingredient Germ Cell Mutagenicity invivo Data

Oral Exposure Route
Dermal Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below

Product Reproductive Toxicity Data

Oral Exposure Route
Dermal Exposure Route
If available, see ingredient data below
Inhalation (Dust/Mist) Exposure Route
If available, see ingredient data below
Inhalation (Vapor) Exposure Route
If available, see ingredient data below
Inhalation (Gas) Exposure Route
If available, see ingredient data below
Inhalation (Gas) Exposure Route
If available, see ingredient data below

Ingredient Reproductive Toxicity Data

Oral Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

12. ECOLOGICAL INFORMATION

Ecotoxicity Harmful to aquatic life with long lasting effects

Product Ecological Data This Product is by Weight 100% an Individual Pure Chemical

Substance

Aquatic toxicity

Fish If available, see ingredient data below Crustacea If available, see ingredient data below Algae If available, see ingredient data below

Ingredient Ecological Data

Aquatic toxicity

Fish No data available

Crustacea If available, see ingredient data below

Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Salt of N,N-Diethyl-p-Phenyl enediamine (100%) CAS#: -	48 Hours	Daphina magna	EC50	10.8 mg/L	Internal Data

Algae No data available

Other Information

Persistence and degradability

Product Biodegradability Data

This Product is by Weight 100% an Individual Pure Chemical Substance.

Ingredient Biodegradability Data

EN / AGHS Page 10/14

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



Analyzers

Issue Date 12-Oct-2016 Revision Date 17-Apr-2018

Version 4.4 Page 11 / 14

Chemical name	Test method	Biodegradation	Exposure time	Results
Salt of N,N-Diethyl-p-Phen enediamine (100%) CAS#: -	None reported	None reported	None reported	Not determined

Bioaccumulation

Product Bioaccumulation Data

This Product is by Weight 100% an Individual Pure Chemical Substance.

Partition Coefficient (n-octanol/water)

Partition coefficient

Ingredient Bioaccumulation Data

Chemical name	Test method	Exposure time	Species	Bioconcentrat ion factor (BCF)	Results
Salt of N,N-Diethyl-p-Phenyl enediamine (100%) CAS#: -	None reported	None reported	None reported	None reported	Not determined

Mobility

Soil Organic Carbon-Water Partition Coefficient

No data available

Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Completely soluble	> 10000 mg/L	25 °C / 77 °F

Other adverse effects

No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused products

Dispose of in accordance with local regulations. Dispose of waste in accordance with

environmental legislation.

Contaminated packaging Do not reuse empty containers.

US EPA Waste Number Not applicable, D002

14. TRANSPORT INFORM	NOITAI	ı
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U.S. DOT Not regulated

EN / AGHS Page 11 / 14



Analyzers

Revision Date 17-Apr-2018

Version 4.4 Page 12/14

TDGNot regulatedIATANot regulatedIMDGNot regulated

Additional information

Issue Date 12-Oct-2016

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods.

If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories

TSCA Complies DSL/NDSL Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EINECS/ELINCS Complies Complies **ENCS** Complies **IECSC KECL** Complies **PICCS** Complies Complies **TCSI AICS** Complies NZIoC Complies

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substances Inventory
AICS - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

Acute health hazard Yes
Chronic Health Hazard Yes
Fire hazard No
Sudden release of pressure hazard No
Reactive Hazard No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

EN / AGHS Page 12/14



Analyzers

Revision Date 17-Apr-2018

Version 4.4 Page 13/14

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

US State Regulations

Issue Date 12-Oct-2016

California Proposition 65

This product does not contain any Proposition 65 chemicals

IMERC: Not applicable

U.S. State Right-to-Know Regulations

U.S. EPA Label Information

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Special Comments

None

Additional information

Global Automotive Declarable Substance List (GADSL)

Not applicable

NFPA and HMIS Classifications

NFPA	Health hazards - 2	Flammability - 0	Instability - 0	Physical and Chemical Properties -
HMIS	Health hazards - 1	Flammability - 0	Physical Hazards - 0	Personal protection - X - See section 8 for more
				information

Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH Immediately Dangerous to Life or Health

ACGIH ACGIH (American Conference of Governmental Industrial Hygienists)

NDF no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)

MAC Maximum Allowable Concentration Ceiling Ceiling Limit Value

X Listed Vacated These values have no official status. The only

binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that

EN / AGHS Page 13/14

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



Analyzers

Revision Date 17-Apr-2018

Version 4.4 Page 14/14

some reference state regulations of these "liberated" exposure limits in their state

regulations.

SKN* Skin designation SKN+ Skin sensitization
RSP+ Respiratory sensitization ** Hazard Designation
C Carcinogen R Reproductive toxicant

M mutagen

Issue Date 12-Oct-2016

Prepared By Hach Product Compliance Department

 Issue Date
 12-Oct-2016

 Revision Date
 17-Apr-2018

Revision Note SDS sections updated

2

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY@2018

End of Safety Data Sheet

EN / AGHS Page 14/14



HACH 2314011





SAFETY DATA SHEET

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018 Version 2.5 Page 1/15

1. IDENTIFICATION

Product identifier

Product Name Free Chlorine Indicator Solution for CL-17 Analyzer

Other means of identification

 Product Code(s)
 2314011

 Safety data sheet number
 M00598

 UN/ID no
 UN2586

Recommended use of the chemical and restrictions on use

Recommended Use Laboratory reagent. Determination of Free Chlorine.

Uses advised against None. Restrictions on use None.

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

Emergency telephone number

+1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Corrosive to metals	Category 1
Skin corrosion/irritation	Category 1
Serious eye damage/eye irritation	Category 1

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Signal word - Danger

EN / A	GHS Page	1 / 15



Product Code(s) 2314011

Issue Date 17-Apr-2018 Version 2.5

Product Name Free Chlorine Indicator Solution for CL-17 Analyzer Revision Date 17-Apr-2018 Page 2/15



Hazard statements

H290 - May be corrosive to metals

H314 - Causes severe skin burns and eye damage

Precautionary statements
P260 - Do not breathe dust/fume/gas/mist/vapors/spray

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting
P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower

P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P310 - Immediately call a POISON CENTER or doctor/physician

P363 - Wash contaminated clothing before reuse

P405 - Store locked up

P501 - Dispose of contents/ container to an approved waste disposal plant

P234 - Keep only in original container

P390 - Absorb spillage to prevent material damage

Other Hazards Known

May be harmful if swallowed

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable

<u>Mixture</u>

Percent ranges are used where confidential product information is applicable.

Chemical name	CAS No.	Percent Range	HMRIC #
Toluene, 4-sulfonic acid, monohydrate	6192-52-5	5 - 10%	

EN / AGHS Page 2/15



Analyzer

Revision Date 17-Apr-2018

Version 2.5 Page 3/15

4. FIRST AID MEASURES

Description of first aid measures

Issue Date 17-Apr-2018

General advice Show this safety data sheet to the doctor in attendance. Immediate medical attention is

required.

Inhalation Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical

attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. Get immediate medical

advice/attention.

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Remove contact lenses, if present and easy to do. Continue rinsing. Keep eye wide open

while rinsing. Do not rub affected area. Get immediate medical advice/attention.

Skin contact Wash off immediately with soap and plenty of water while removing all contaminated

clothes and shoes. Get immediate medical advice/attention.

Ingestion Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth

to an unconscious person. Do NOT induce vomiting. Get immediate medical

advice/attention.

Self-protection of the first aider Avoid contact with skin, eyes or clothing. Ensure that medical personnel are aware of the

material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid direct contact with skin. Use barrier to give mouth-to-mouth

resuscitation

Most important symptoms and effects, both acute and delayed

Symptoms Burning sensation.

Indication of any immediate medical attention and special treatment needed

Note to physicians Product is a corrosive material. Use of gastric lavage or emesis is contraindicated.

Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood

pressure may occur with moist rales, frothy sputum, and high pulse pressure.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media Use extinguishing measures that are appropriate to local circumstances and the

surrounding environment.

Unsuitable Extinguishing Media Caution: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the

chemical

The product causes burns of eyes, skin and mucous membranes. Thermal decomposition

can lead to release of irritating gases and vapors.

Hazardous combustion products This material will not burn.

Special protective equipment for

fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout

gear.

6. ACCIDENTAL RELEASE MEASURES

EN / AGHS Page 3/15



Analyzer

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.5 Page 4/15

U.S. Notice Only persons properly qualified to respond to an emergency involving hazardous

substances may respond to a spill according to federal regulations (OSHA 29 CFR

1910.120(a)(v)) and per your company's emergency response plan and

guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations

should respond to a spill involving chemicals.

Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal

protective equipment as required. Attention! Corrosive material. Evacuate personnel to

safe areas. Keep people away from and upwind of spill/leak.

Other Information Refer to protective measures listed in Sections 7 and 8.

Environmental precautions

Environmental precautions Prevent further leakage or spillage if safe to do so. Should not be released into the

environment. Do not allow to enter into soil/subsoil. Prevent product from entering drains.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Pick up and transfer to properly labeled containers.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

Reference to other sections See section 8 for more information. See section 13 for more information.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with

skin, eyes or clothing. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation. Do not eat, drink or smoke when using this product. Take off contaminated

clothing and wash before reuse.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from

moisture. Store locked up. Keep out of the reach of children. Store away from other

materials.

Flammability class Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines This product, as supplied, does not contain any hazardous materials with occupational

exposure limits established by the region specific regulatory bodies

EN / AGHS Page 4/15



Analyzer

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.5 Page 5/15

Appropriate engineering controls

Engineering Controls

Showers Eyewash stations Ventilation systems.

Individual protection measures, such as personal protective equipment

exceeded or irritation is experienced, ventilation and evacuation may be required.

Hand Protection Wear suitable gloves. Impervious gloves.

Eye/face protection Face protection shield.

Skin and body protection Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron.

General Hygiene Considerations Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this

product. Regular cleaning of equipment, work area and clothing is recommended. Avoid contact with skin, eyes or clothing. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Contaminated work clothing should not be allowed out of the workplace. Wash hands before breaks and immediately after handling the product.

Environmental exposure controls Local authorities should be advised if significant spillages cannot be contained. Do not

allow into any sewer, on the ground or into any body of water.

Thermal hazards None under normal processing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state Liquid

 Appearance Odor
 aqueous solution
 Color colorless

 Odor Irritating
 Odor threshold
 No data available

Property Values Remarks • Method

Molecular weight No data available

pH 0.34

Melting point/freezing point -3 °C / 27 °F

Boiling point / boiling range ~ 101 °C / 214 °F Estimation based on theoretical

calculation

Evaporation rate 0.8 (water = 1)

Vapor pressure 17.327 mm Hg / 2.31 kPa at 20 °C / 68 °F Estimation based on theoretical

calculation

Vapor density (air = 1) 0.62

Specific gravity (water = 1 / air = 1) 1.027

Partition Coefficient (n-octanol/water)

Not applicable

Soil Organic Carbon-Water Partition

Not applicable

Coefficient

Autoignition temperature No data available

EN / AGHS Page 5/15



Analyzer

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.5 Page 6/15

Decomposition temperature No data available

Dynamic viscosity $\sim 1.5 \text{ cP (mPa s)}$ at 20 °C / 68 °F

Kinematic viscosity ~ 1.461 cSt (mm²/s) at 20 °C / 68 °F

Solubility(ies)
Water solubility

 Water solubility classification
 Water solubility
 Water Solubility Temperature

 Soluble
 > 1000 mg/L
 25 °C / 77 °F

Solubility in other solvents

Chemical Name	Solubility classification	<u>Solubility</u>	Solubility Temperature
Acid	Soluble	> 1000 mg/L	25 °C / 77 °F
Aqueous alkaline solutions	Soluble	> 1000 mg/L	25 °C / 77 °F
Ethyl alcohol	Soluble	> 1000 mg/L	25 °C / 77 °F
Ether	Soluble	> 1000 mg/L	25 °C / 77 °F

Other Information

Metal Corrosivity

Classified as corrosive to metal according to GHS criteria

Steel Corrosion Rate
Aluminum Corrosion Rate

52.07 mm/yr / 2.05 in/yr

Volatile Organic Compounds (VOC) Content

Chemical name	CAS No.	Volatile organic compounds (VOC) content	CAA (Clean Air Act)
Toluene, 4-sulfonic acid, monohydrate	6192-52-5	Not applicable	

Explosive properties

 Upper explosion limit
 No data available

 Lower explosion limit
 No data available

Flammable properties

Flash point No data available

Flammability Limit in Air

Upper flammability limit:
Lower flammability limit:
No data available
No data available

Oxidizing properties
No data available.

Bulk density
Not applicable

Particle Size No information available

Particle Size Distribution No information available

EN / AGHS Page 6/15



Analyzer

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.5 Page 7/15

10. STABILITY AND REACTIVITY

Reactivity

Not applicable.

Chemical stability

Stability Stable under normal conditions.

Explosion data

Sensitivity to Mechanical Impact None Sensitivity to Static Discharge None.

Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing.

Hazardous polymerization None under normal processing.

Conditions to avoid

Conditions to avoid Exposure to air or moisture over prolonged periods.

Incompatible materials

Incompatible materials Oxidizing agent. Acids. Bases.

Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information

Inhalation Corrosive by inhalation. Inhalation of corrosive fumes/gases may cause coughing, choking,

headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs.

Pulmonary edema can be fatal.

Eve contact Causes burns. Corrosive to the eyes and may cause severe damage including blindness.

Causes serious eye damage. May cause irreversible damage to eyes.

Skin contact May cause irritation.

Ingestion Causes burns. Ingestion causes burns of the upper digestive and respiratory tracts. May

cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung

damage if swallowed. May be fatal if swallowed and enters airways.

Redness. Burning. May cause blindness. Coughing and/ or wheezing. Symptoms .

Aggravated Medical Conditions Eye disorders. Skin disorders. Respiratory disorders.

Toxicologically synergistic None known.

products

Toxicokinetics, metabolism and See ingredients information below.

distribution

Product Acute Toxicity Data

Oral Exposure Route No data available

EN / AGHS Page 7/15

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



Analyzer

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.5 Page 8/15

Dermal Exposure RouteNo data availableInhalation (Dust/Mist) Exposure RouteNo data availableInhalation (Vapor) Exposure RouteNo data availableInhalation (Gas) Exposure RouteNo data available

Unknown Acute Toxicity

0.01% of the mixture consists of ingredient(s) of unknown toxicity.

Acute Toxicity Estimations (ATE)

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)	4,073.00 mg/kg
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	No information available
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

Ingredient Acute Toxicity Data

Oral Exposure Route If available, see data below

Oral Exposure Route					
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Toluene, 4-sulfonic acid, monohydrate (5 - 10%) CAS#: 6192-52-5	Rat	400 mg/kg	None reported	None reported	HSDB (Hazardous Substances Data Bank)
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Toluene, 4-sulfonic acid, monohydrate (5 - 10%) CAS#: 6192-52-5	Mouse	735 mg/kg	None reported	None reported	HSDB (Hazardous Substances Data Bank)

Dermal Exposure Route	If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Toluene, 4-sulfonic acid, monohydrate (5 - 10%) CAS#: 6192-52-5	Rabbit	> 2000 mg/kg		None reported	No information available

Inhalation (Dust/Mist) Exposure Route If available, see data below

Chemical name	Endpoint	Reported	Exposure	Toxicological effects	Key literature references and
	type	dose	time		sources for data
Toluene, 4-sulfonic acid, monohydrate (5 - 10%) CAS#: 6192-52-5	Rat LC ₅₀	> 25 mg/L	None reported	None reported	No information available

 Inhalation (Vapor) Exposure Route
 If available, see data below

 Inhalation (Gas) Exposure Route
 If available, see data below

Product Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
Inhalation (Gas) Exposure Route
Inhalation (Gas) Exposure Route
Inhalation (Gas) Exposure Route
No data available

Ingredient Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below

EN / AGHS Page 8/15



Analyzer

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.5 Page 9/15

 Inhalation (Dust/Mist) Exposure Route
 If available, see data below

 Inhalation (Vapor) Exposure Route
 If available, see data below

 Inhalation (Gas) Exposure Route
 If available, see data below

Aspiration toxicity

If available, see data below

Kinematic viscosity ~ 1.461 cSt (mm²/s)

Product Skin Corrosion/Irritation Data

No data available.

Ingredient Skin Corrosion/Irritation Data

If available, see data below

Product Serious Eye Damage/Eye Irritation Data

No data available.

Ingredient Eye Damage/Eye Irritation Data

No data available

Sensitization Information

Product Sensitization Data

 Skin Sensitization Exposure Route
 No data available.

 Respiratory Sensitization Exposure Route
 No data available.

Ingredient Sensitization Data

 Skin Sensitization Exposure Route
 If available, see data below.

 Respiratory Sensitization Exposure Route
 If available, see data below.

Chronic Toxicity Information

Product Specific Target Organ Toxicity Repeat Dose Data

Oral Exposure RouteNo data available.Dermal Exposure RouteNo data available.Inhalation (Dust/Mist) Exposure RouteNo data available.Inhalation (Vapor) Exposure RouteNo data available.Inhalation (Gas) Exposure RouteNo data available.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below

Product Carcinogenicity Data

Oral Exposure RouteNo data availableDermal Exposure RouteNo data availableInhalation (Dust/Mist) Exposure RouteNo data availableInhalation (Vapor) Exposure RouteNo data availableInhalation (Gas) Exposure RouteNo data available

Ingredient Carcinogenicity Data

ingredient Carcinogenicit	Data				5
Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
Toluene, 4-sulfonic acid, monohydrate	6192-52-5	-	-	-	% = :

Legend

EN / AGHS	Page 9/15

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



Analyzer

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.5 **Page** 10 / 15

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply
NTP (National Toxicology Program)	Does not apply
OSHA (Occupational Safety and Health Administration of the US Department of	Does not apply
Labor)	e∞ u

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route

Product Germ Cell Mutagenicity invitro Data

No data available.

Ingredient Germ Cell Mutagenicity invitro Data

No data available

Product Germ Cell Mutagenicity invivo Data

Oral Exposure RouteNo data availableDermal Exposure RouteNo data availableInhalation (Dust/Mist) Exposure RouteNo data availableInhalation (Vapor) Exposure RouteNo data availableInhalation (Gas) Exposure RouteNo data available

Ingredient Germ Cell Mutagenicity invivo Data

Oral Exposure Route
Dermal Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
If available, see data below
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below

Product Reproductive Toxicity Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
Inhalation (Gas) Exposure Route
No data available
No data available

Ingredient Reproductive Toxicity Data

Oral Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

12. ECOLOGICAL INFORMATION

Ecotoxicity Not considered to be harmful to aquatic life

Product Ecological Data

Aquatic toxicity

Fish No data available
Crustacea No data available
Algae No data available

Ingredient Ecological Data

Aquatic toxicity

EN / AGHS Page 10 / 15

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



Analyzer

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.5 Page 11/15

Fish		If a	If available, see ingredient data below				
Chemical name Exposure		Species	Endpoint	Reported	Key literature references and		
	time		type	dose	sources for data		
Toluene, 4-sulfonic	96 hours	Oncorhynchus mykiss	LC50	60 mg/L	IPCS INCHEM (International		
acid, monohydrate		n		10=10	Programme on Chemical Safety)		
(5 - 10%)							
CAS#: 6192-52-5							

Crustacea Algae If available, see ingredient data below If available, see ingredient data below

Other Information

Persistence and degradability

Product Biodegradability Data

No data available.

Ingredient Biodegradability Data

Chemical name	Test method	Biodegradation	Exposure time	Results
Toluene, 4-sulfonic acid, monohydrate (5 - 10%) CAS#: 6192-52-5	None reported	94%	21 days	Readily biodegradable

Bioaccumulation

Product Bioaccumulation Data

No data available.

Partition Coefficient (n-octanol/water)

Not applicable

Ingredient Bioaccumulation Data

Chemical name	Test method	Exposure time	Species	Bioconcentrat ion factor (BCF)	Results
Toluene, 4-sulfonic acid, monohydrate (5 - 10%) CAS#: 6192-52-5	None reported	None reported	None reported	None reported	Not determined

Mobility

Soil Organic Carbon-Water Partition Coefficient

Not applicable

Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Other adverse effects

No information available.

EN / AGHS Page 11 / 15



Analyzer

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.5 Page 12/15

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused Dispo

products

Dispose of in accordance with local regulations. Dispose of waste in accordance with

environmental legislation.

Contaminated packaging Do not reuse empty containers.

US EPA Waste Number D002

Special instructions for disposal Work in an approved fume hood. Dilute material with excess water making a weaker than

5% solution. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. If permitted by regulation. Open cold water tap completely, slowly pour the reacted material to the drain. Allow cold water to run for 5 minutes to completely flush the system. Check with local municipal and state authorities and waste contractors for pertinent

local information regarding the proper disposal of chemicals.

14. TRANSPORT INFORMATION

U.S. DOT

UN/ID no UN2586

Proper shipping name Alkylsulfonic acids, liquid

Hazard Class 8
Packing Group III

Description UN2586, Alkyl sulfonic acids, liquid, 8, III

Emergency Response Guide 153

Num ber

TDG

UN/ID no UN2586

Proper shipping name Arylsulphonic Acid, Liquid

Hazard Class 8
Packing Group III

Description UN2586, Alkylsulfonic acids, liquid, 8, III

IATA

UN/ID no UN2586

Proper shipping name Alkylsulphonic acids, liquid

Hazard Class 8
Packing Group III
ERG Code 8L
Special precautions for user A803

Description UN2586, Alkylsulphonic acids, liquid, 8, III

IMDG

UN/ID no UN2586

Proper shipping name Alkylsulphonic acids, liquid Arylsulphonic Acid, Liquid

Hazard Class 8
Packing Group III
EmS-No F-A, S-B

Description UN2586, Alkylsulphonic acids, liquid, 8, III

Note: No special precautions necessary.

Additional information

EN / AGHS Page 12/15



Analyzer

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.5 Page 13/15

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods.

If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories

TSCA Complies
DSL/NDSL Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EINECS/ELINCS Complies **ENCS** Complies **IECSC** Complies **KECL** Complies **PICCS** Complies **TCSI** Complies Complies AICS NZIoC Complies

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substances Inventory AICS - Australian Inventory of Chemical Substances NZIOC - New Zealand Inventory of Chemicals

NZIOC - New Zealand Inventory of Chemica

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

Acute health hazard Yes
Chronic Health Hazard Yes
Fire hazard No
Sudden release of pressure hazard No
Reactive Hazard No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

EN / AGHS Page 13/15



Analyzer

Revision Date 17-Apr-2018

Version 2.5 Page 14/15

US State Regulations

Issue Date 17-Apr-2018

California Proposition 65

This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

U.S. EPA Label Information

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Special Comments

None

Additional information

Global Automotive Declarable Substance List (GADSL)

Not applicable

NFPA and HMIS Classifications

NFPA	Health hazards - 3	Flammability - 0	Instability - 0	Physical and Chemical
				Properties -
HMIS	Health hazards - 3	Flammability - 0	Physical Hazards - 0	Personal protection - X
				- See section 8 for more
				information

Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH Immediately Dangerous to Life or Health

ACGIH (American Conference of Governmental Industrial Hygienists)

NDF no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)

MAC Maximum Allowable Concentration Ceiling Ceiling Limit Value

X Listed Vacated These values have no official status. The only

binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state

regulations.

SKN*Skin designationSKN+Skin sensitizationRSP+Respiratory sensitization**Hazard DesignationCCarcinogenRReproductive toxicant

M mutagen

Prepared By Hach Product Compliance Department

EN / AGHS Page 14 / 15



Analyzer

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.5 Page 15/15

 Issue Date
 17-Apr-2018

 Revision Date
 17-Apr-2018

Revision Note None

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

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End of Safety Data Sheet

EN / AGHS Page 15/15



HACH 2314111





SAFETY DATA SHEET

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018 Version 2.1 Page 1/12

1. IDENTIFICATION

Product identifier

Product Name Free Chlorine Buffer for CL-17 Analyzer

Other means of identification

 Product Code(s)
 2314111

 Safety data sheet number
 M00599

Recommended use of the chemical and restrictions on use

Recommended Use Laboratory reagent. Determination of Free Chlorine.

Uses advised against None. Restrictions on use None.

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

Emergency telephone number

+1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Not a dangerous substance or mixture according to the Globally Harmonized System (GHS)

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Hazard statements

The product contains no substances which at their given concentration, are considered to be hazardous to health

Other Hazards Known

May be harmful if swallowed

3. COMPOSITION/INFORMATION ON INGREDIENTS

EN / AGHS Page 1/12



Product Code(s) 2314111 Issue Date 17-Apr-2018 Version 2.1 Product Name Free Chlorine Buffer for CL-17 Analyzer Revision Date 17-Apr-2018

Page 2/12

Substance Not applicable

Mixture

4. FIRST AID MEASURES

Description of first aid measures

General advice No hazards which require special first aid measures. Use first aid treatment according to

the nature of the injury.

Inhalation Remove to fresh air.

Eye contact Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids.

Consult a physician.

Skin contact Wash skin with soap and water.

Ingestion Clean mouth with water and drink afterwards plenty of water.

Most important symptoms and effects, both acute and delayed

Symptoms See Section 11 for additional Toxicological Information.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. FIRE-FIGHTING MEASURES

surrounding environment.

Unsuitable Extinguishing Media Caution: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the

chemical

No information available.

Hazardous combustion products Carbon monoxide, Carbon dioxide.

Special protective equipment for

fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout

gear.

6. ACCIDENTAL RELEASE MEASURES

U.S. Notice Only persons properly qualified to respond to an emergency involving hazardous

substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13. Special Instructions for disposal assistance

guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations

should respond to a spill involving chemicals.

Personal precautions, protective equipment and emergency procedures

Personal precautions Ensure adequate ventilation.

EN / AGHS Page 2/12

Product Name Free Chlorine Buffer for CL-17 Analyzer



Product Code(s) 2314111 Issue Date 17-Apr-2018

Revision Date 17-Apr-2018 Page 3/12

Version 2.1 Pag

Environmental precautions

Environmental precautions See Section 12 for additional ecological information.

Methods and material for containment and cleaning up

Methods for containmentPrevent further leakage or spillage if safe to do so.Methods for cleaning upPick up and transfer to properly labeled containers.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

Reference to other sections See section 8 for more information. See section 13 for more information.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place.

Flammability class Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines This product, as supplied, does not contain any hazardous materials with occupational

exposure limits established by the region specific regulatory bodies

Appropriate engineering controls

Engineering Controls Showers

Eyewash stations Ventilation systems

Individual protection measures, such as personal protective equipment

exceeded or irritation is experienced, ventilation and evacuation may be required.

Hand Protection Wear suitable gloves.

Eyelface protection Wear safety glasses with side shields (or goggles).

Skin and body protectionNo special protective equipment required.

General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practice.

Environmental exposure controls Local authorities should be advised if significant spillages cannot be contained. Do not

allow into any sewer, on the ground or into any body of water.

Thermal hazards None under normal processing.

EN / AGHS Page 3/12



Product Code(s) 2314111 Issue Date 17-Apr-2018 Version 2.1 Product Name Free Chlorine Buffer for CL-17 Analyzer

Revision Date 17-Apr-2018

Page 4/12

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state

Liquid

Appearance

aqueous solution

Bland

Color Odor threshold

yellow No data available

Property

Values

Molecular weight

No data available

Remarks • Method

рН

Odor

7.06

Melting point/freezing point

-65 °C / -85 °F

Boiling point I boiling range

99 °C / 210 °F

Evaporation rate Vapor pressure 0.53 (water = 1)

22.427 mm Hg / 2.99 kPa at 25 °C / 77 °F

Estimation based on theoretical

calculation

Vapor density (air = 1)

0.62 (air = 1)

Specific gravity (water = 1 / air = 1)

Partition Coefficient (n-octanol/water)

A4 00 0000 70

1.21

Soil Organic Carbon-Water Partition

Not applicable

Coefficient

Not applicable

No data available

Autoignition temperature

No data available

Decomposition temperature

Dynamic viscosity

No data available

Kinematic viscosity

No data available

Solubility(ies)

Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Solubility in other solvents

Chemical Name	Solubility classification	Solubility	Solubility Temperature
Acid	Soluble	> 1000 mg/L	25 °C / 77 °F

Other Information

Metal Corrosivity

Steel Corrosion RateNo data availableAluminum Corrosion RateNo data available

Volatile Organic Compounds (VOC) Content

EN / AGHS Page 4/12



Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.1 Page 5/12

Explosive properties

Upper explosion limitNo data availableLower explosion limitNo data available

Flammable properties

Flash point No data available

Flammability Limit in Air

Upper flammability limit:No data availableLower flammability limit:No data available

Oxidizing properties No data available.

Bulk density Not applicable

Particle Size No information available

Particle Size Distribution No information available

10. STABILITY AND REACTIVITY

Reactivity

Not applicable.

Chemical stability

Stability Stable under normal conditions.

Explosion data

Sensitivity to Mechanical Impact None Sensitivity to Static Discharge None.

Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing.

Hazardous polymerization

None under normal processing.

Conditions to avoid

Conditions to avoid None known based on information supplied.

Incompatible materials

Incompatible materials Strong oxidizing agents, strong acids, and strong bases.

Hazardous Decomposition Products

Heating to decomposition releases toxic fumes of carbon monoxide and carbon dioxide.

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information

 Inhalation
 No known effect based on information supplied.

 Eye contact
 No known effect based on information supplied.

 Skin contact
 No known effect based on information supplied.

Ingestion No known effect based on information supplied.

EN / AGHS Page 5/12



Product Code(s) 2314111 Issue Date 17-Apr-2018 Version 2.1 Product Name Free Chlorine Buffer for CL-17 Analyzer

Revision Date 17-Apr-2018

Page 6/12

Symptoms No information available.

Aggravated Medical Conditions None known.

Toxicologically synergistic None known.

products

Toxicokinetics, metabolism and No information available.

distribution

Product Acute Toxicity Data

Oral Exposure RouteNo data availableDermal Exposure RouteNo data availableInhalation (Dust/Mist) Exposure RouteNo data availableInhalation (Vapor) Exposure RouteNo data availableInhalation (Gas) Exposure RouteNo data available

Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

Acute Toxicity Estimations (ATE)

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)	2,870.00 mg/kg
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	No information available
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

Ingredient Acute Toxicity Data

Oral Exposure Route
Dermal Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below

Product Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
No data available
No data available
No data available

Ingredient Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route
Dermal Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
If available, see data below
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below

Aspiration toxicity

No data available

Product Skin Corrosion/Irritation Data

No data available.

Ingredient Skin Corrosion/Irritation Data

If available, see data below

Product Serious Eye Damage/Eye Irritation Data

EN / AGHS Page 6/12



Product Code(s) 2314111 Issue Date 17-Apr-2018

Product Name Free Chlorine Buffer for CL-17 Analyzer

Revision Date 17-Apr-2018

Page 7/12

No data available.

Version 2.1

Ingredient Eye Damage/Eye Irritation Data

No data available

Sensitization Information

Product Sensitization Data

Skin Sensitization Exposure Route No data available. Respiratory Sensitization Exposure Route No data available.

Ingredient Sensitization Data

Skin Sensitization Exposure Route If available, see data below. Respiratory Sensitization Exposure Route If available, see data below.

Chronic Toxicity Information

Product Specific Target Organ Toxicity Repeat Dose Data

Oral Exposure Route No data available. Dermal Exposure Route No data available. Inhalation (Dust/Mist) Exposure Route No data available. Inhalation (Vapor) Exposure Route No data available. Inhalation (Gas) Exposure Route No data available.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

Oral Exposure Route If available, see data below If available, see data below **Dermal Exposure Route** Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Carcinogenicity Data

No data available Oral Exposure Route **Dermal Exposure Route** No data available Inhalation (Dust/Mist) Exposure Route No data available Inhalation (Vapor) Exposure Route No data available Inhalation (Gas) Exposure Route No data available

Ingredient Carcinogenicity Data

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply
NTP (National Toxicology Program)	Does not apply
OSHA (Occupational Safety and Health Administration of the US Department of	Does not apply
Labor)	5002 50

Oral Exposure Route If available, see data below **Dermal Exposure Route** If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Germ Cell Mutagenicity invitro Data

No data available.

Ingredient Germ Cell Mutagenicity invitro Data

No data available

Product Germ Cell Mutagenicity invivo Data

EN / AGHS Page 7/12

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.1 Page 8/12

Oral Exposure RouteNo data availableDermal Exposure RouteNo data availableInhalation (Dust/Mist) Exposure RouteNo data availableInhalation (Vapor) Exposure RouteNo data availableInhalation (Gas) Exposure RouteNo data availableInhalation (Gas) Exposure RouteNo data available

Ingredient Germ Cell Mutagenicity invivo Data

Oral Exposure Route
Dermal Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
If available, see data below
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route

Product Reproductive Toxicity Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route

Ingredient Reproductive Toxicity Data

Oral Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
If available, see data below
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
If available, see data below

12. ECOLOGICAL INFORMATION

Ecotoxicity Not considered to be harmful to aquatic life

Product Ecological Data

Aquatic toxicity

FishNo data availableCrustaceaNo data availableAlgaeNo data available

Ingredient Ecological Data

Aquatic toxicity

FishNo data availableCrustaceaNo data availableAlgaeNo data available

Other Information

Persistence and degradability

Product Biodegradability Data

No data available.

Ingredient Biodegradability Data

Bioaccumulation

Product Bioaccumulation Data

No data available.

EN / AGHS Page 8/12



Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.1 Page 9/12

Partition Coefficient (n-octanol/water) Not applicable

Ingredient Bioaccumulation Data

Mobility

Soil Organic Carbon-Water Partition Coefficient Not applicable

Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Other adverse effects

No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused products

Dispose of in accordance with local regulations. Dispose of waste in accordance with

environmental legislation.

Contaminated packaging Do not reuse empty containers.

Special instructions for disposal Open cold water tap completely, slowly pour the material to the drain.

14. TRANSPORT INFORMATION

U.S. DOT Not regulated

TDG Not regulated

IATA Not regulated

IMDG Not regulated

Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods.

If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories

TSCA Complies DSL/NDSL Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EN / AGHS Page 9/12



Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.1 **Page** 10 / 12

EINECS/ELINCS Does not comply **ENCS** Does not comply **IECSC** Complies **KECL** Complies **PICCS** Does not comply TCSI Complies AICS Does not comply Does not comply **NZIoC**

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances IECSC - China Inventory of Existing Chemical Substances KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substances Inventory
AICS - Australian Inventory of Chemical Substances
NZIOC - New Zealand Inventory of Chemicals

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

Acute nealth nazard	res
Chronic Health Hazard	No
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

U.S. EPA Label Information

EN / AGHS

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Page 10/12



Product Code(s) 2314111 Issue Date 17-Apr-2018 Product Name Free Chlorine Buffer for CL-17 Analyzer

Revision Date 17-Apr-2018

Page 11/12

Special Comments

Version 2.1

None

Additional information

Global Automotive Declarable Substance List (GADSL)

Not applicable

NFPA and HMIS Classifications

NFPA	Health hazards - 0	Flammability - 0	Instability - 0	Physical and Chemical Properties -
HMIS	Health hazards - 0	Flammability - 0	Physical Hazards - 0	Personal protection - X - See section 8 for more information

Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH Immediately Dangerous to Life or Health

ACGIH (American Conference of Governmental Industrial Hygienists)

NDF no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)

MAC Maximum Allowable Concentration Ceiling Ceiling Limit Value

X Listed Vacated These values have no official status. The only

binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state

regulations.

SKN*Skin designationSKN+Skin sensitizationRSP+Respiratory sensitization**Hazard DesignationCCarcinogenRReproductive toxicant

M mutagen

Prepared By Hach Product Compliance Department

 Issue Date
 17-Apr-2018

 Revision Date
 17-Apr-2018

Revision Note None

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

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EN / AGHS Page 11 / 12



Product Code(s) 2314111 Issue Date 17-Apr-2018 Version 2.1 **Product Name** Free Chlorine Buffer for CL-17 Analyzer **Revision Date** 17-Apr-2018 **Page** 12 / 12

End of Safety Data Sheet

EN / AGHS Page 12/12



HACH 2756549





SAFETY DATA SHEET

Issue Date 31-Aug-2016 Revision Date 29-Dec-2017 Version 3.1 Page 1/14

1. IDENTIFICATION

Product identifier

Product Name pH Storage Solution

Other means of identification

 Product Code(s)
 2756549

 Safety data sheet number
 M01702

Recommended use of the chemical and restrictions on use

Recommended Use Laboratory reagent. Electrode storage solution.

Uses advised against None. Restrictions on use None.

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

Emergency telephone number

+1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Not a dangerous substance or mixture according to the Globally Harmonized System (GHS)

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Hazard statements

The product contains no substances which at their given concentration, are considered to be hazardous to health

Other Information

Not applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

EN / AGHS



Product Name pH Storage Solution Revision Date 29-Dec-2017 Page 2/14

Substance Not applicable

Mixture

Percent ranges are used where confidential product information is applicable.

Chemical I	name	CAS No.	Percent Range	HMRIC#
Phosphoric acid, pota	assium salt (1:1)	7778-77-0	<1%	-
Sodium phosph	ate dibasic	7558-79-4	<0.1%	=
Glutaralde	hyde	111-30-8	<0.1%	5
Chemical name Phosphoric acid, potassium salt (1:1) 7778-77-0	CAS No. 7778-77-0	Weight-% 0.34		
Sodium phosphate dibasic 7558-79-4	7558-79-4	0.05		
Glutaraldehyde 111-30-8	111-30-8	0.02		

4. FIRST AID MEASURES

Description of first aid measures

General advice No hazards which require special first aid measures. Use first aid treatment according to

the nature of the injury.

Inhalation Remove to fresh air.

Eye contact Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids.

Consult a physician.

Skin contact Wash skin with soap and water.

Clean mouth with water and drink afterwards plenty of water. Ingestion

Most important symptoms and effects, both acute and delayed

Symptoms 5 4 1 See Section 11 for additional Toxicological Information.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. FIRE-FIGHTING MEASURES	
	_

Suitable Extinguishing Media Use extinguishing measures that are appropriate to local circumstances and the

E FIDE FIGURING MEACURE

surrounding environment.

Caution: Use of water spray when fighting fire may be inefficient. Unsuitable Extinguishing Media

Specific hazards arising from the No information available.

chemical

Hazardous combustion products This material will not burn.

Special protective equipment for fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout

EN / AGHS Page 2/14

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



Product Name pH Storage Solution Revision Date 29-Dec-2017 Page 3 / 14

6. ACCIDENTAL RELEASE MEASURES

U.S. Notice Only persons properly qualified to respond to an emergency involving hazardous

substances may respond to a spill according to federal regulations (OSHA 29 CFR

1910.120(a)(v)) and per your company's emergency response plan and

guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations

should respond to a spill involving chemicals.

Personal precautions, protective equipment and emergency procedures

Personal precautions Ensure adequate ventilation.

Environmental precautions

Environmental precautions See Section 12 for additional ecological information.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Pick up and transfer to properly labeled containers.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

Reference to other sections See section 8 for more information. See section 13 for more information.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place.

Flammability class Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Glutaraldehyde	Ceiling: 0.05 ppm	(vacated) Ceiling: 0.2 ppm	Ceiling: 0.2 ppm
CAS#: 111-30-8		(vacated) Ceiling: 0.8 mg/m³	Ceiling: 0.8 mg/m ³

Appropriate engineering controls

Engineering Controls Showers

Eyewash stations Ventilation systems.

Individual protection measures, such as personal protective equipment

EN / AGHS Page 3/14

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



Product Code(s) 2756549 Product Name pH Storage Solution Issue Date 31-Aug-2016 Revision Date 29-Dec-2017

Version 3.1 Page 4/14

Respiratory protection No protective equipment is needed under normal use conditions. If exposure limits are

exceeded or irritation is experienced, ventilation and evacuation may be required.

Hand Protection Wear suitable gloves.

Wear safety glasses with side shields (or goggles). Eyelface protection

Skin and body protection No special protective equipment required.

General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practice.

Environmental exposure controls Local authorities should be advised if significant spillages cannot be contained. Do not

allow into any sewer, on the ground or into any body of water.

Thermal hazards None under normal processing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state Liquid

aqueous solution Color colorless **Appearance**

clear

Odor Odorless Odor threshold No data available

Property Values Remarks • Method

Molecular weight No data available

6.4

Melting point/freezing point ~ -49 °C / -56 °F Estimation based on theoretical

calculation

Boiling point / boiling range ~ 113 °C / 235 °F Estimation based on theoretical

calculation

Evaporation rate 0.87 (water = 1) Estimation based on theoretical

calculation

Vapor pressure 16.502 mm Hg / 2.2 kPa at 20 °C / 68 °F

Estimation based on theoretical

calculation

Vapor density (air = 1) 0.62

Estimation based on theoretical 1.15 Specific gravity (water = 1 / air = 1)

calculation

Partition Coefficient (n-octanol/water) Not applicable Soil Organic Carbon-Water Partition Not applicable

Coefficient

No data available Autoignition temperature

No data available Decomposition temperature No data available Dynamic viscosity Kinematic viscosity No data available

Solubility(ies)

EN / AGHS Page 4/14



Product Name pH Storage Solution Revision Date 29-Dec-2017 Page 5 / 14

Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Solubility in other solvents

Chemical Name	Solubility classification	<u>Solubility</u>	Solubility Temperature_
Acid	Soluble	> 1000 mg/L	25 °C / 77 °F

Other Information

Metal Corrosivity

Steel Corrosion Rate
Aluminum Corrosion Rate

No data available No data available

Volatile Organic Compounds (VOC) Content

See ingredients information below

Chemical name	CAS No.	Volatile organic compounds (VOC) content	CAA (Clean Air Act)
Phosphoric acid, potassium salt (1:1)	7778-77-0	No data available	=
Sodium phosphate dibasic	7558-79-4	No data available	=
Glutaraldehyde	111-30-8	No data available	-

Explosive properties

Upper explosion limit No data available Lower explosion limit No data available

Flammable properties

Flash point No data available
Method No information available

Flammability Limit in Air

Upper flammability limit:
Lower flammability limit:
No data available
No data available

Oxidizing properties
No data available.

Bulk density
Not applicable

Particle Size No information available

Particle Size Distribution No information available

10. STABILITY AND REACTIVITY

Reactivity

Not applicable.

Chemical stability

Stability Stable under normal conditions.

Explosion data

EN / AGHS Page 5/14

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



Product Name pH Storage Solution Revision Date 29-Dec-2017 Page 6 / 14

Sensitivity to Mechanical Impact None Sensitivity to Static Discharge None.

Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing.

Hazardous polymerization

None under normal processing.

Conditions to avoid

Conditions to avoid None known based on information supplied.

Incompatible materials

Incompatible materials Strong oxidizing agents, strong acids, and strong bases.

Hazardous Decomposition Products

Chlorides. Potassium oxide.

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information

Inhalation No known effect based on information supplied.

Eye contact No known effect based on information supplied.

Skin contact No known effect based on information supplied.

Ingestion No known effect based on information supplied.

Symptoms No information available.

Aggravated Medical Conditions None known.

Toxicologically synergistic None known.

products

Toxicokinetics, metabolism and See ingredients information below.

distribution

Chemical name	Toxicokinetics, metabolism and distribution	
Sodium phosphate	Phosphates are widely utilized by cells for metabolism of proteins, fats and carbohydrates.	
dibasic		
(<0.1%)		
CAS#: 7558-79-4		

Product Acute Toxicity Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
Inhalation (Gas) Exposure Route
No data available
No data available

Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

Acute Toxicity Estimations (ATE)

The following values are calculated based on chapter 3.1 of the GHS document

EN / AGHS Page 6/14



sion 3.1

Page 7/14

Product Name pH Storage Solution

Revision Date 29-Dec-2017

ATEmix (oral)	13,347.00 mg/kg
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	No information available
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

Ingredient Acute Toxicity Data

			If available, see data below	
Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Mouse LD50	1700 mg/kg	None reported	None reported	IUCLID (The International Uniform Chemical Information Database)
Rat LD50	134 mg/kg	None reported	None reported	GESTIS (Information System on Hazardous Substances of the German Social Accident Insurance)
Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Rat LD50	17000 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)
	Endpoint type Mouse LD50 Rat LD50 Endpoint type Rat	Endpoint type Reported dose Mouse LD50 1700 mg/kg Rat LD50 134 mg/kg Endpoint type Reported dose Rat 17000 mg/kg	Endpoint type Reported dose time Exposure time Mouse LD50 1700 mg/kg None reported Rat LD50 134 mg/kg None reported Endpoint type Reported dose Exposure time Rat 17000 mg/kg None	Endpoint type Reported dose Exposure time Toxicological effects Mouse LD50 1700 mg/kg None reported None reported Rat LD50 134 mg/kg None reported None reported Endpoint type Reported dose Exposure time Toxicological effects Rat 17000 mg/kg None None reported

Dermai Exposure Ro	ute			it available, see data below	
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Glutaraldehyde (<0.1%) CAS#: 111-30-8	Rabbit LD50	594 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Phosphoric acid, potassium salt (1:1) (<1%) CAS#: 7778-77-0	Rabbit LD ₅₀	> 4640 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)

Inhalation (Dust/Mist) Exposure Re				
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Glutaraldehyde	Rat	0.48 mg/L	4 hours	None reported	IUCLID (The International
(<0.1%)	LC50				Uniform Chemical Information
CAS#: 111-30-8					Database)

Inhalation (Vapor) Exposure Route Inhalation (Gas) Exposure Route

If available, see data below If available, see data below

Product Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
No data available
No data available
No data available

Ingredient Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route
Dermal Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
If available, see data below
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below

EN / AGHS Page 7/14

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



Product Name pH Storage Solution Revision Date 29-Dec-2017 Page 8 / 14

Aspiration toxicity

No data available

Product Skin Corrosion/Irritation Data

No data available.

Ingredient Skin Corrosion/Irritation Data

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sodium phosphate dibasic (<0.1%) CAS#: 7558-79-4	Standard Draize Test	Rabbit	500 mg	24 hours	Skin irritant	RTECS (Registry of Toxic Effects of Chemical Substances)
Glutaraldehyde (<0.1%) CAS#: 111-30-8	Standard Draize Test	Human	6 mg	72 hours	Corrosive to skin	RTECS (Registry of Toxic Effects of Chemical Substances)

Product Serious Eye Damage/Eye Irritation Data

No data available.

Ingredient Eye Damage/Eye Irritation Data

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sodium phosphate dibasic (<0.1%) CAS#: 7558-79-4	Standard Draize Test	Rabbit	500 mg	24 hours	Eye irritant	RTECS (Registry of Toxic Effects of Chemical Substances)

Sensitization Information

Product Sensitization Data

Skin Sensitization Exposure Route
Respiratory Sensitization Exposure Route
No data available.
No data available.

Ingredient Sensitization Data

Skin Sensitization Exposure Route If available, see data below. Respiratory Sensitization Exposure Route If available, see data below.

Chronic Toxicity Information

Product Specific Target Organ Toxicity Repeat Dose Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available.
No data available.
No data available.
No data available.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

Oral Exposure Route
Dermal Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route

Product Carcinogenicity Data

 Oral Exposure Route
 No data available

 Dermal Exposure Route
 No data available

EN / AGHS Page 8/14



Product Name pH Storage Solution Revision Date 29-Dec-2017

Page 9/14

 Inhalation (Dust/Mist) Exposure Route
 No data available

 Inhalation (Vapor) Exposure Route
 No data available

 Inhalation (Gas) Exposure Route
 No data available

Ingredient Carcinogenicity Data

Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
Phosphoric acid, potassium salt (1:1)	7778-77-0	-	-	1	-
Sodium phosphate dibasic	7558-79-4	3		<u> </u>	E.
Glutaraldehyde	111-30-8	=	22	2	12

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply
NTP (National Toxicology Program)	Does not apply
OSHA (Occupational Safety and Health Administration of the US Department of	Does not apply
Labor)	

Oral Exposure Route
Dermal Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
If available, see data below
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route

Product Germ Cell Mutagenicity invitro Data

No data available.

Ingredient Germ Cell Mutagenicity invitro Data

If available, see data below

Product Germ Cell Mutagenicity invivo Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
No data available
No data available
No data available

Ingredient Germ Cell Mutagenicity invivo Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below

Product Reproductive Toxicity Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
Inhalation (Gas) Exposure Route
No data available

Ingredient Reproductive Toxicity Data

Oral Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route

12. ECOLOGICAL INFORMATION

EN / AGHS Page 9/14



Product Code(s) 2756549 Issue Date 31-Aug-2016

Version 3.1

Product Name pH Storage Solution **Revision Date** 29-Dec-2017

Page 10/14

Ecotoxicity

Product Ecological Data

Aquatic toxicity

FishNo data availableCrustaceaNo data availableAlgaeNo data available

Ingredient Ecological Data

Aquatic toxicity

Fish If available, see ingredient data below

Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Glutaraldehyde (<0.1%) CAS#: 111-30-8	96 hours	None reported	LC50	3.5 mg/L	NIH (National Institutes of Health)
Crustacea	- 25		lf available see ir	naredient data	helow

Ciustacea		ii avallable, see iligredient data below			DEIOW
Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Glutaraldehyde (<0.1%) CAS#: 111-30-8	48 Hours	None reported	EC50	0.75 mg/L	GESTIS (Information System on Hazardous Substances of the German Social Accident Insurance)

Algae No data available

Other Information

Persistence and degradability

Product Biodegradability Data

No data available.

Ingredient Biodegradability Data

Chemical name	Test method	Biodegradation	Exposure time	Results
Potassium chloride (10 - 20%) CAS#: 7447-40-7	Inorganic Salt	None reported	None reported	Not readily biodegradable

Bioaccumulation

Product Bioaccumulation Data

No data available.

Partition Coefficient (n-octanol/water) Not applicable

Ingredient Bioaccumulation Data

Mobility

Soil Organic Carbon-Water Partition Coefficient Not applicable

Water solubility

EN / AGHS Page 10/14



Product Name pH Storage Solution Revision Date 29-Dec-2017 Page 11 / 14

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Other adverse effects

No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused

products

Dispose of in accordance with local regulations. Dispose of waste in accordance with

environmental legislation.

Contaminated packaging Do not reuse empty containers.

Special instructions for disposal

Check with local municipal and state authorities and waste contractors for pertinent local

information regarding the proper disposal of chemicals.

14. TRANSPORT INFORMATION

U.S. DOT Not regulated

TDG Not regulated

IATA Not regulated

IMDG Not regulated

Note: No special precautions necessary.

Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods.

If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories

TSCA Complies DSL/NDSL Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EINECS/ELINCS Complies **ENCS** Complies **IECSC** Complies Complies KECL **PICCS** Complies TCSI Complies Complies AICS **NZIoC** Complies

EN / AGHS Page 11 / 14



Product Name pH Storage Solution Revision Date 29-Dec-2017 Page 12 / 14

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substances Inventory AICS - Australian Inventory of Chemical Substances NZIOC - New Zealand Inventory of Chemicals

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

Acute health hazard	No
Chronic Health Hazard	No
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sodium phosphate dibasic 7558-79-4	5000 lb	5	-	X

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

Chemical name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Sodium phosphate dibasic	5000 lb	 :	RQ 5000 lb final RQ
7558-79-4			RQ 2270 kg final RQ

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Sodium phosphate dibasic 7558-79-4	Х	X	X
Glutaraldehyde 111-30-8	Х	Х	Х

EN / AGHS	Page 12/14

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



Product Name pH Storage Solution Revision Date 29-Dec-2017 Page 13 / 14

U.S. EPA Label Information

Chemical name	FIFRA	FDA
Phosphoric acid, potassium salt (1:1)	180.0920	01 81
Sodium phosphate dibasic	180.0910	21 CFR 182.1778,21 CFR 182.6290,21
54 14		CFR 182.6778,21 CFR 182.8778

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Special Comments

None

Additional information

Global Automotive Declarable Substance List (GADSL)

Chemical name	Global Automotive Declarable Substance List Classifications	Global Automotive Declarable Substance List Thersholds
Glutaraldehyde 111-30-8	Declarable Substance (LR) Prohibited Substance (LR)	0.0 %

NFPA and HMIS Classifications

NFPA	Health hazards - 0	Flammability - 0	Instability - 0	Physical and Chemical Properties -
HMIS	Health hazards - 0	Flammability - 0	Physical Hazards - 0	Personal protection - X
- 10 miles (10 m		~		- See section 8 for more
				information

Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH Immediately Dangerous to Life or Health

ACGIH ACGIH (American Conference of Governmental Industrial Hygienists)

NDF no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)

MAC Maximum Allowable Concentration Ceiling Ceiling Limit Value

X Listed Vacated These values have no official status. The only

binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state

regulations.

SKN*Skin designationSKN+Skin sensitizationRSP+Respiratory sensitization**Hazard DesignationCCarcinogenRReproductive toxicantMmutagen

Prepared By Hach Product Compliance Department

EN / AGHS Page 13/14



Product Name pH Storage Solution Revision Date 29-Dec-2017 Page 14 / 14

 Issue Date
 31-Aug-2016

 Revision Date
 29-Dec-2017

Revision Note None

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY@2017

End of Safety Data Sheet

EN / AGHS Page 14/14



WEST C-358P INHIBITOR





HMIS RATING: HEALTH 2 FLAMMABILITY 0 REACTIVITY 0 OTHER C

WEST C-358P Inhibitor

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: WEST C-358P Cooling Tower Inhibitor

PRODUCT DESCRIPTION: An aqueous corrosion and scale inhibitor. This product is designed

specifically for the control of corrosion and mineral scales in open

circulating cooling water systems.

MANUFACTURER:

Water & Energy Systems Technology, Inc.

13109 Arctic Circle

Santa Fe Springs, CA 92801

Customer Service: (562) 921-5191

24 HR. EMERGENCY TELEPHONE NUMBER

Chem-Tel (U.S.): (800) 255-3924

2. COMPOSITION / INFORMATION ON INGREDIENTS

EXPOSURE LIMITS

Chemical Name OSHA PEL ACGIH TLV CAS# 1310-58-3 2 mg/m³ ceiling 2 mg/m3 ceiling Potassium Hydroxide

Azole Salts Not Established

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

PHYSICAL APPEARANCE: Yellow liquid, bland odor.

IMMEDIATE CONCERNS: Substance may be harmful if swallowed. Poses little or no immediate

hazard.

POTENTIAL HEALTH EFFECTS

EYES: Corrosive to the eyes and may cause severe damage including blindness.

SKIN: Substance may cause slight skin irritation.

SKIN ABSORPTION: Contact causes severe skin irritation and possible burns.

INGESTION: Harmful if swallowed. Results in severe burning and injury.

INHALATION: Harmful if inhaled. Mists may cause damage to the upper respiratory tract and

even the lung tissue proper.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: None Known.

ACUTE EFFECTS: Multiple small burns can result from exposure.

SUBCHRONIC/CHRONIC TOXICITY

CHRONIC: Death may occur if penetration into vital areas occurs. Scarring may so constrict or destroy damaged tissue that extensive corrective surgery may be required.

CARCINOGENICITY: This product's ingredients are not found in the Federal or Cal OSHA, NTP, IARC lists of suspected cancer causing agents.

Page 1 of 4

Water & Energy Systems Technology, Inc. 13109 Arctic Circle - Santa Fe Springs, CA 90670 - Telephone (562) 921-5191



WEST C-358P Inhibitor

4. FIRST AID MEASURES

EYES: Flush eye with water for 15 minutes. Get medical attention.

SKIN: Immediately remove clothing under safety shower. Flush skin with large amounts of soap and water. Wash clothing separately before reuse.

INGESTION: If swallowed, do NOT induce vomiting. Give victim large quantities of water. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person. **INHALATION:** Remove to fresh air. If not breathing, give artificial respiration. Get immediate medical attention.

5. FIRE FIGHTING MEASURES

FLASHPOINT AND METHOD: Not Applicable AUTOIGNITION TEMPERATURE: Not Applicable

EXPLOSION HAZARDS: No unusual fire or explosion hazards **FIRE FIGHTING PROCEDURES:** No special fire fighting procedures

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILL: Clean up spills immediately, observing precautions in Protective Equipment section. Flush with a water spray. Pick up wash liquid with absorbent or vacuum and place in a disposable container.

LARGE SPILL: Large spills should be handled according to a predetermined plan.

ENVIRONMENTAL PRECAUTIONS

WATER SPILL: Do not flush to sewer.

7. HANDLING AND STORAGE

GENERAL PROCEDURES: Use with adequate ventilation. Follow all MSDS/label precautions even after container is emptied because they may retain product residues.

Contents may develop pressure upon prolonged storage. Loosen closure cautiously before opening.

Always add water with constant stirring to avoid generation of excessive amounts of heat.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Local exhaust ventilation may be necessary to control any air contaminants to within their PELs (TLVs) during the use of this product.

PERSONAL PROTECTION

EYES AND FACE: Wear safety glasses with side shields (or goggles) and a face shield. SKIN: Nitrile rubber, PVC or Neoprene gloves are suitable protective materials. RESPIRATORY: NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. PROTECTIVE CLOTHING: Where splashing is possible, full chemically resistant protective

WORK HYGIENIC PRACTICES: Do not get in eyes, on skin, or on clothing.

clothing, rubber apron and boots are required.

Page 2 of 4



WEST C-358P Inhibitor

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: Liquid ODOR: Bland odor. COLOR: Amber or yellow

pH: 12.0

PERCENT VOLATILE: None
VAPOR DENSITY: Not determined
BOILING POINT: >212°F

EVAPORATION RATE: <1
SPECIFIC GRAVITY: 1.124
WATER SOLUBILITY: Soluble

EVAPORATION RATE: <1 (butyl acetate = 1)

10. STABILITY AND REACTIVITY

STABLE: YES

HAZARDOUS POLYMERIZATION: NO

CONDITIONS TO AVOID: Generation of heat by reaction with water or acids.

HAZARDOUS DECOMPOSITION: Carbon monoxide, carbon dioxide, ammonia, and oxides of nitrogen. **INCOMPATIBLE MATERIALS:** Acids, oxidizing materials, halogen compounds, copper, zinc and

galvanized metals.

11. TOXICOLOGICAL INFORMATION

CARCINOGENICITY COMMENTS: This product's ingredients are not found in the Federal or Cal OSHA, NTP, IARC lists of suspected cancer causing agents.

Note: California employers using Cal OSHA regulated carcinogens must register with Cal OSHA.

12. ECOLOGICAL INFORMATION

No data is available at this time regarding the environmental impacts of this product.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Dispose of all wastes in accordance with federal, state, and local regulations.

Page 3 of 4



WEST C-358P Inhibitor

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION)

PROPER SHIPPING NAME: CAUSTIC ALKALI LIQUID, N.O.S.

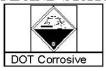
PRIMARY HAZARD CLASS/DIVISION: 8

UN/NA NUMBER: UN 1719 PACKING GROUP: II LABEL: Corrosive - 8 NAERG: 154

OTHER SHIPPING INFORMATION: CONTAINS (POTASSIUM HYDROXIDE, LIQUID)

15. REGULATORY INFORMATION

DOT LABEL SYMBOL AND STATEMENT OF HAZARD:



SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)
FIRE: NO PRESSURE GENERATING: NO REACTIVITY: NO ACUTE: NO CHRONIC: NO

16. OTHER INFORMATION

DATE PREPARED: 7/14/2010

MSDS No: C358P

MANUFACTURER DISCLAIMER: The information contained herein is provided in good faith and believed to be correct as of the date hereof. However, WEST, Inc. makes no representation as to the comprehensiveness or accuracy of the information. It is expected that individuals receiving the information will exercise their independent judgement in determining its appropriateness for a particular purpose. Accordingly, WEST, Inc. will not be responsible for damages of any kind resulting from the use of or reliance upon such information. No representations, or warranties, either expressed or implied, of merchantability fitness for a particular purpose or of any other nature are made hereunder with respect to the information set fourth herein or to the product to which the information refers.

Page 4 of 4



WEST C-825





HMIS RATING:
HEALTH 2
FLAMMABILITY 0
REACTIVITY 0
OTHER B

WEST C-825

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: WEST C-825

MANUFACTURER:

Water & Energy Systems Technology, Inc.

13109 Arctic Circle

Santa Fe Springs, CA 92801 Customer Service: (562) 921-5191 24 HR. EMERGENCY TELEPHONE NUMBER

Chem-Tel (U.S.): (800) 255-3924

2. COMPOSITION / INFORMATION ON INGREDIENTS

EXPOSURE LIMITS

Chemical NameCAS#OSHA PELACGIH TLVSodium bisulfate7681-38-1Not DeterminedNot Determined

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION: May cause severe irritation to eyes. May be irritating to respiratory tract.

PHYSICAL APPEARANCE: Clear colorless liquid, odorless POTENTIAL HEALTH EFFECTS

Signs and Symptoms of Acute Overexposure: Contact with mist, or vapor may cause skin irritation. Contact with eyes will cause immediate pain. May be corrosive to corneal tissue. May cause irritation to nose and throat. May be corrosive to esophagal linings and mucous membranes if ingested.

Signs and Symptoms of Chronic overexposure: Repeated exposure may cause chronic bronchitis or respiratory inflammation. Repeated or extended skin contact may be corrosive. Repeated eye contact may cause conjunctivitis and photosensitization

Medical Conditions Generally Aggravated by Exposure: No Data Available

4. FIRST AID MEASURES

Inhalation: Remove victim to fresh air. Get prompt medical attention

Ingestion: Do not induce vomiting. Give victim large amounts of milk or water to drink. Get victim to hospital promptly.

Skin Contact: Remove contaminated clothing and footwear. Wash skin for 15 minutes with soap and water. Wash clothing before reuse. If irritation persists, get medical attention.

Eye Contact: Immediately flush eyes with water for 15 minutes. Forcibly hold eyelids apart to ensure complete irrigation of eye and eyelid tissue. Do not allow victim to rub or keep eyes closed. Get immediate medical attention.

Note to Physician: Treat symptomatically. No specific antidote.

Page 1 of 4

Water & Energy Systems Technology, Inc. 13109 Arctic Circle – Santa Fe Springs, CA 90670 - Telephone (562) 921-5191



WEST C-825

5. FIRE FIGHTING MEASURES

FIRE

Flash point: Not Applicable

Autoignition temperature: Not Applicable Flammable limits in air % by volume:

lel: ND; uel: ND

UNUSUAL FIRE OR EXPLOSION HAZARDS

Not Combustable.

FIRE EXTINGUISHING MEDIA

Not combustible. Use extinguishing method suitable for surrounding fire.

SPECIAL FIRE FIGHTING PRECEDURES:

None

HAZARDOUS DECOMPOSITION MATERIALS (Under Fire Conditions):

Sulfur dioxide and/or sulfur trioxide may be released in fire, if water is allowed to evaporate. Wear SCBA if in fire situation.

6. ACCIDENTAL RELEASE MEASURES

Evacuation Procedures and Safety:

Ventilate closed spaces before entering. Wear appropriate protective gear for situation. See Personal Protection information in Section 8.

Containment of Spill:

Follow procedure described below under Cleanup and Disposal of Spill

Cleanup and Disposal of Spill:

Scrape up and place in appropriate closed container (see Section 7: Handling and Storage). Collect washings for disposal. Decontaminate tools and equipment following cleanup. Clean up residual material by washing area with water. Avoid creation of dusty conditions.

Environmental and Regulatory Reporting:

Do not flush to drain. If spilled on the ground, the affected area should be scraped clean placed in an appropriate container for disposal. Prevent material form entering public sewer system or any waterways. Large spills should be handled according to a predetermined plan. For assistance in developing a plan contact with the WEST Inc. using the Customer Service phone number in Section 1.

7. HANDLING AND STORAGE

GENERAL PROCEDURES:

Protect against physical damage. Normal precautions common to safe manufacturing practice should be followed in handling and storage. Do not get in eyes. Do not breathe dusts. Avoid direct or prolonged contact with skin. Containers of this material may be hazardous when empty since they retain product residues; observe all warnings and precautions listed for the product. Store in an area that is cool, dry, well-ventilated

FOR INDUSTRY USE ONLY.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Introductory Remarks:

These recommendations provide general guidance for handling this product. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. While developing safe handling procedures, do not overlook the need to clean equipment and piping systems for maintenance and repairs. Waste resulting from these procedures should be handled in accordance with Section 13: Disposal Considerations.

Page 2 of 4



WEST C-825

OSHA Final PELs: NDA OSHA Vacated PELs: NDA

Engineering Controls:

Where engineering controls are indicated by use conditions or a potential for excessive exposure exists, the following traditional exposure control techniques may be used to effectively minimize employee exposures.

Respiratory Protection:

When respirators re required, select NIOSH/MSHA approved equipment based on actual or potential airborne concentrations and in accordance with the latest OSHA standard (29 CFR 1910.134) and/or ANSI Z88.2 recommendations. Under normal conditions, in the absence of other airborne contaminants, the following devices should provide protection from this material up to the conditions specified by OSHA/ANSI: Air-purifying (half-mask / full-face) respirator with cartridges / canister approved for use against dusts, mists and fumes.

Eye/Face Protection:

Eye and face protection requirements will vary dependent upon work environment conditions and material handling practices. Appropriate ANSI Z87 approved equipment should be selected for the particular use intended for this material. It is generally regarded as good practice to wear a minimum of safety glasses with side shields when working in industrial environments.

Skin Protection:

Skin contact should be minimized through use of gloves and suitable long-sleeved clothing (i.e., shirts and pants). Consideration must be given both to durability as well as permeation resistance.

Work Practice Controls:

Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material:

- Do not store, use, and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored.
- Wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics, or using the toilet.
- 3) Wash exposed skin promptly to remove accidental splashes of contact with this material.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation*, *A Manual of Recommended Practices*, most recent edition, for details.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Clear Colorless Liquid

Odor:OdorlessSolubility:Water-solubleSpecific Gravity:1.147 at 20°C (68 F)

pH: 1.0-2.0
Boiling Point: ~212 °F
Melting Point: Not Applicable
Vapor Density (Air=1): Not Applicable
Vapor Pressure (kPa): Not Applicable

10. STABILITY AND REACTIVITY

Stability: Product is stable under normal conditions of storage and handling.

Hazardous Decomposition Products: Sulphur dioxide and sulphur trioxide gases.

Hazardous Polymerization: will not occur.

Incompatibility: Strong oxidizers, nitric acid, chlorine. Solution is acidic and reacts with bases.

Conditions to Avoid: Incompatible substances.

Page 3 of 4



WEST C-825

11. TOXICOLOGICAL INFORMATION

Toxicological Data:

Considered GRAS by FDA. Carcinogenicity: Sodium bisulfate and water are not listed by ACGIH, IARC, NIOSH, NTR, or OSHA

12. ECOLOGICAL INFORMATION

Ecotoxicological Information:

No data found for product.

Chemical Fate Information:

No data found for product.

13. DISPOSAL CONSIDERATIONS

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. State and local disposal regulations may differ from federal disposal regulations. Empty containers may contain residues. Thoroughly clean empty container, then offer for recycling, reuse or disposal in accordance with federal, state and local requirements.

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION)

DOT Proper Shipping Name: CORROSIVE LIQUID, N.O.S., 8,UN1760, PG III

CONTAINS (INORGANIC ACID SOLUTION)

DOT Hazard Class: 8 (Corrosive)

UN Number: 1760

15. REGULATORY INFORMATION

TSCA: All chemical ingredients are listed on TSCA inventory, with no special reporting regulations CERCLA Reportable Quantity: Not subject to CERCLA reporting

SARA TITLE III:

......Section 302/304 Extremely Hazardous Substances: None

......Section 311 Hazard Categorization: Acute Health

.....Section 313 Toxic Chemicals: NDA

Not subject to Proposition 65 labeling requirements (California)

CAA: Ingredients not listed as hazardous pollutants under CAA

OSHA: None of the ingredients are considered Extremely Hazardous by OSHA

16. OTHER INFORMATION

DATE PREPARED: 2/23/2011

MSDS No: C-825

MANUFACTURER DISCLAIMER: The information contained herein is provided in good faith and believed to be correct as of the date hereof. However, WEST, Inc. makes no representation as to the comprehensiveness or accuracy of the information. It is expected that individuals receiving the information will exercise their independent judgement in determining its appropriateness for a particular purpose. Accordingly, WEST, Inc. will not be responsible for damages of any kind resulting from the use of or reliance upon such information. No representations, or warranties, either expressed or implied, of merchantability fitness for a particular purpose or of any other nature are made hereunder with respect to the information set fourth herein or to the product to which the information refers.

Page 4 of 4



WEST R-630





HMIS RATING: HEALTH 1 FLAMMABILITY 0 REACTIMITY 0 OTHER C

Safety Data Sheet WÉST R-630

SECTION 1: Identification

1.1 Product identifier

WEST R-630 Sulfite Product name

Product number R-630

1.2 Recommended use An aqueous solution of sodium and potassium sulfites, bisulfites and

metabisulfites designed specifically for halogen removal in process water

systems.

1.3 Supplier's details

Water & Energy Systems Technology, Inc. Name

Address 13109 Arctic Cr.

Santa Fe Springs, CA 90670

Telephone (562) 921-5191

1.4 Emergency phone number(s) Chem-Tel (U.S.): (800) 255-3924

SECTION 2: Hazard identification

Classification of the substance or mixture

GHS classification in accordance with OSHA (29 CFR 1910.1200)

- Skin corrosion/irritation (chapter 3.2), Cat. 3
- Eye damage/irritation (chapter 3.3), Cat. 2B

2.2 GHS label elements, including precautionary statements

Signal word	Warning
Hazard statement(s)	
H316	Causes mild skin irritation
H320	Causes eye irritation
Precautionary statement(s)	
P332+P313	If skin irritation occurs: Get medical advice/attention.
P264	Wash hands thoroughly after handling.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P337+P313	If eye irritation persists: Get medical advice/attention.

SECTION 3: Composition/information on ingredients

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 1 of 6



Safety Data Sheet WEST R-630

3.1 Mixtures

This product does not contain any hazardous materials under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

Trade secret statement (OSHA 1910.1200(i))

Specific chemical identity and/or exact percentage of composition has been withheld as a trade secret.

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

General advice Avoid contact with skin, eyes and clothing. Wash hands before breaks and

immediately after handling the product.

If inhaled Remove to fresh air. If not breathing, give artificial respiration. Get immediate

medical attention.

In case of skin contact Immediately remove clothing under safety shower. Flush skin with large

amounts of soap and water. Wash clothing separately before reuse.

In case of eye contact Flush eye with water for 15 minutes. Get medical attention.

If swallowed Do NOT induce vomiting. Give victim large quantities of water. Call a

physician or poison control center immediately.

Personal protective equipment for first-aid responders

No data available.

4.2 Most important symptoms/effects, acute and delayed

No data available.

4.3 Indication of immediate medical attention and special treatment needed, if necessary

No data available.

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

No data available.

5.2 Specific hazards arising from the chemical

No data available.

5.3 Special protective actions for fire-fighters

No special fire fighting procedures.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Wear appropriate personal protective equipment as specified in Section 8.

6.2 Environmental precautions

Do not flush to sewer.

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 2 of 6



Safety Data Sheet WEST R-630

Methods and materials for containment and cleaning up

No data available

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Use with adequate ventilation. Follow all SDS/label precautions even after container is emptied because they may retain product residues.

7.2 Conditions for safe storage, including any incompatibilities

Contents may develop pressure upon prolonged storage. Loosen closure cautiously before opening.

SECTION 8: Exposure controls/personal protection

Control parameters

No exposure limits noted for ingredient(s).

8.2 Appropriate engineering controls

Local exhaust ventilation may be necessary to control any air containments to within their PELs (TLVs) during the use of this product.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear safety glasses with side shields (or goggles) and a face shield.

Skin protection

Nitrile rubber, PVC, or Neoprene gloves are suitable protective materials.

Body protection

Where splashing is possible, full chemically resistant protective clothing, rubber apron and boots are required.

Respiratory protection

NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited.

Thermal hazards

No data available.

Environmental exposure controls

No data available.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance/form Clear pink liquid Odor No appreciable odor. Odor threshold No data available. рН ~6.5

Melting point/freezing point No data available. 212 F

Initial boiling point and boiling range

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 3 of 6

Attachment E E-191 of 208



Safety Data Sheet WEST R-630

Flash point No data available. Evaporation rate <1 (butyl acetate = 1) Flammability (solid, gas) No data available. Vapor pressure No data available. Vapor density No data available. Relative density 1.251 Solubility(ies) Water Soluble Partition coefficient: n-octanol/water No data available. Auto-ignition temperature No data available. Decomposition temperature No data available. Viscosity No data available. Explosive properties No data available. Oxidizing properties No data available.

SECTION 10: Stability and reactivity

10.1 Reactivity

No data available.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available.

10.4 Conditions to avoid

Generation of heat by reaction with water or acids.

10.5 Incompatible materials

Acids, oxidizing materials, halogen compounds, copper, zinc and galvanized metals.

10.6 Hazardous decomposition products

Carbon monoxide, carbon dioxide, ammonia, and oxides of nitrogen.

SECTION 11: Toxicological information

Information on toxicological effects

Acute toxicity

No data available.

Skin corrosion/irritation

No data available.

Serious eye damage/irritation

No data available.

Respiratory or skin sensitization

No data available.

Germ cell mutagenicity

No data available.

Carcinogenicity

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 4 of 6



Safety Data Sheet WEST R-630

This product's ingredients are not found in the federal or Cal OSHA NTP, or IARC lists of suspected cancer causing agents.

Reproductive toxicity

No data available.

STOT-single exposure

No data available.

STOT-repeated exposure

No data available.

Aspiration hazard

No data available.

SECTION 12: Ecological information

Toxicity

No data available.

Persistence and degradability

No data available.

Bioaccumulative potential

No data available.

Mobility in soil

No data available.

Results of PBT and vPvB assessment

No data available.

SECTION 13: Disposal considerations

Disposal of the product

Dispose of all waste in accordance with federal, state, and local regulations.

Disposal of contaminated packaging

Dispose of as unused product.

Waste treatment

No data available.

Sewage disposal

No data available.

SECTION 14: Transport information

DOT (US)

Proper Shipping Name: D.O.T. NONREGULATED WATER TREATMENT LIQUID COMPOUND

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 5 of 6



Safety Data Sheet WEST R-630

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)
FIRE: NO PRESSURE GENERATING: NO REACTIVITY: NO ACUTE: YES CHRONIC: NO

SECTION 16: Other information

Further information/disclaimer

The information contained herein is provided in good faith and believed to be correct as of the date hereof. WEST, Inc. makes no representation as to the comprehensiveness or accuracy of the information. It is expected that the individuals receiving the information will exercise their independent judgment in determining its appropriateness for a particular purpose. Accordingly, WEST, Inc. will not be responsible for damages of any kind resulting in the use of or reliance upon such information. No representations, or warranties, either expressed or implied, of merchantability fitness for a particular purpose or of any other nature are made hereunder with respect to the information set fourth herein or to the product to which the information refers.

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 6 of 6



BRIGHT DYES FLT YELLOW/GREEN LIQUID





Safety Data Sheet

Issue Date: 04-Oct-2013 Revision Date: 06-Feb-2017 Version Number: 1.1

1. Identification

Product Identifiers

Product Name: Bright Dyes® FLT Yellow/Green Liquid

Product Number: 106001

Recommended Use & Restrictions on Use

Water tracing & leak detection dye

Manufacturer/Supplier

Kingscote Chemicals, Inc. 3334 South Tech Blvd. Miamisburg, OH 45342 U.S.A.

Emergency Telephone Number

Company Telephone Number: (937) 886-9100

Emergency Telephone (24 hr): INFOTRAC (800) 535-5053 (North America)

+1-352-323-3500 (International)

2. Hazards Identification

Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least

15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs:

Get medical advice/attention.

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek

medical attention immediately.

Page 1 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Liquid

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give

anything by mouth to an unconscious person. Get medical attention if large

quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation.

Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the

system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media

Water spray (fog). Carbon dioxide (CO2). Dry chemical. Regular foam.

Unsuitable Extinguishing Media

Not determined

Specific Hazards Arising from the Chemical

Product is not flammable. Burning/combustion may produce oxides of carbon and nitrogen (NOx).

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or

groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area

with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices.

Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing

should be thoroughly washed before reuse.

Page 2 of 6



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry, and well-

ventilated area. Keep from freezing.

Incompatible Materials Acids.

8. Exposure Controls / Personal Protection

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection Goggles.

Skin & Body Protection Rubber gloves. Suitable protective clothing.

Respiratory Protection No protection is ordinarily required under normal conditions of use.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practices.

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

Physical StateLiquidOdorNone apparentAppearanceYellow/green liquidOdor ThresholdNot determined

Color Yellow/green

PropertyValuespH>8.0Melting/Freezing Point~32° FBoiling Point/Range~212° FFlash PointNot applicable

Evaporation Rate 1.8

Flammability (solid, gas)
Upper Flammability Limits
Lower Flammability Limits
Vapor Pressure
Liquid – not applicable
Not applicable
Not applicable

Vapor Density 0.6

Relative Density
Specific Gravity
Solubility
Partition Coefficient
Auto-ignition Temperature
Viscosity
Not applicable
Not determined
Not determined
Not determined
Not determined
Not determined
Not determined

Page 3 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Liquid

10. Stability and Reactivity

Reactivity

Not reactive under normal conditions.

Chemical Stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials

Acids. Strong oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation Avoid breathing vapors or mists.

Ingestion Do not ingest.

Skin Contact May cause an allergic skin reaction.

Eye Contact Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure

May cause an allergic skin reaction.

Numerical Measures of Toxicity

Not determined

Symptoms Associated with Exposure

See Section 4 of this SDS for symptoms.

Carcinogenicity

NTP None

IARC None

OSHA None

Page **4** of **6**

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Liquid

12. Ecological Information

Ecotoxicity

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Not available

Persistence/Degradability

Not determined

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. Disposal Considerations

Waste Disposal Methods

Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

<u>Note</u>

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

OMDG Not regulated

15: Regulatory Information

International Inventories

TASCA This product is not subject to TSCA 12(b) reporting requirements.

U.S. Federal Regulations

CERCLA This material, as supplied, does not contain any substances regulated as

hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Page 5 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Liquid

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization

Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of

Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants

pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable

state right-to-know regulations.

16: Other Information

Health Hazards	Flammability	Instability	Special Hazards
1	0	0	Not determined

<u>NFPA</u>

Health Hazards	Flammability	Physical Hazards	Personal Protection
1	0	0	В

Revision Date 04-Oct-2013

O6-Feb-2017

Revision Note Content Review

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Page 6 of 6



BRIGHT DYES FLT YELLOW/GREEN TABLETS





Safety Data Sheet

Issue Date: 09-Nov-2013 Revision Date: 06-Feb-2017 Version Number: 2.1

1. Identification

Product Identifiers

Product Name: Bright Dyes® FLT Yellow/Green Tablet

Product Number: 101101

Recommended Use & Restrictions on Use

Water tracing & leak detection dye

Manufacturer/Supplier

Kingscote Chemicals, Inc. 3334 South Tech Blvd. Miamisburg, OH 45342 U.S.A.

Emergency Telephone Number

Company Telephone Number: (937) 886-9100

Emergency Telephone (24 hr): INFOTRAC (800) 535-5053 (North America)

+1-352-323-3500 (International)

2. Hazards Identification

Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least

15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs:

Get medical advice/attention.

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek

medical attention immediately.

Page 1 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Tablet

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give

anything by mouth to an unconscious person. Get medical attention if large

quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation.

Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the

system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media

Water spray (fog). Carbon dioxide (CO2). Dry chemical.

Unsuitable Extinguishing Media

Not determined

Specific Hazards Arising from the Chemical

Remote possibility of dust explosion. Burning may produce oxides of carbon and nitrogen (NOx).

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or

groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area

with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices.

Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing

should not be allowed out of the workplace.

Page 2 of 6



Bright Dyes® FLT Yellow/Green Tablet

Revision Date: 06-Feb-2017

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry, and well-

ventilated area. Store away from heat, sparks, open flame or any other

ignition source.

Incompatible Materials Bromine trifluoride. Lithium. Strong acids, bases, and oxidizing agents.

8. Exposure Controls / Personal Protection

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eve/Face Protection Avoid contact with eyes.

Skin & Body Protection Rubber gloves. Suitable protective clothing.

Respiratory Protection Use NIOSH-approved dust mask if dusty conditions exist.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practices.

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

Physical State Solid None apparent Appearance Orange tablet **Odor Threshold** Not determined

Color Orange

Property Values pН Not applicable Melting/Freezing Point Not applicable **Boiling Point/Range** Not applicable Flash Point Not applicable Not applicable **Evaporation Rate** Flammability (solid, gas) Not flammable **Upper Flammability Limits** Not applicable **Lower Flammability Limits** Not applicable Vapor Pressure Not applicable Vapor Density Not applicable **Relative Density** Not applicable Not applicable **Specific Gravity**

Solubility Highly soluble in water with small amounts of insoluble residue

Partition Coefficient Not determined **Auto-ignition Temperature** Not determined **Decomposition Temperature** Not determined Viscosity Not determined

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Tablet

10. Stability and Reactivity

Reactivity

Not reactive under normal conditions.

Chemical Stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials

Bromine trifluoride. Lithium. Strong acids, bases, and oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation Avoid inhalation of dust.

Ingestion Do not ingest.

Skin Contact May cause an allergic skin reaction.

Eye Contact Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure

May cause an allergic skin reaction.

Numerical Measures of Toxicity

Not determined

Symptoms Associated with Exposure

See Section 4 of this SDS for symptoms.

Carcinogenicity

NTP None

IARC None

OSHA None

Page **4** of **6**

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Tablet

12. Ecological Information

Ecotoxicity

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Not available

Persistence/Degradability

This product is biodegradable.

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. Disposal Considerations

Waste Disposal Methods

Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

<u>Note</u>

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

OMDG Not regulated

15: Regulatory Information

International Inventories

Not determined

U.S. Federal Regulations

CERCLA This material, as supplied, does not contain any substances regulated as

hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Page 5 of 6



Bright Dyes® FLT Yellow/Green Tablet

Revision Date: 06-Feb-2017

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization

Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of

Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants

pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable

state right-to-know regulations.

16: Other Information

IVI	

Health Hazards	Flammability	Instability	Special Hazards
1	0	0	Not determined

<u>NFPA</u>

Health Hazards	Flammability	Physical Hazards	Personal Protection
1	0	0	R

Revision Date 09-Nov-2013

O6-Feb-2017

Revision Note Content Review

<u>Disclaimer</u>

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet



Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application Outfall 03A048 Fact Sheet

Los Alamos Neutron Science Center (LANSCE) Facility Operations (LFO) TA-53-963/964 and TA-53-978/979 Cooling Towers





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Table of Contents

1.0	OUTFALL LOCATION [Section I]	5
2.0	FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]	5
2.1	Process Schematic and Water Balance [II.A]	5
2.2	Water Treatment Processes [II.B]	5
2.3	Discharge Rate and Frequency [II.C]	6
3.0	PRODUCTION [Section III]	6
4.0	IMPROVEMENTS [Section IV]	6
5.0	INTAKE AND EFFLUENT CHARACTERISTICS [Section V]	6
5.1	Analytical Data [V.A, B, and C]	6
5.2	Potential Pollutants [V.D]	7
6.0	POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]	7
7.0	BIOLOGICAL TOXICITY TESTING DATA [Section VII]	7
8.0	CONTRACT ANALYSIS INFORMATION [Section VIII]	7
ATTAC	CHMENT A: Location Map for Outfall 03A048	A-1
ATTAC	CHMENT B: Process Schematic and Water Balance	B-1
ATTAC	CHMENT C: Photographs	C-1
ATTAC	CHMENT D: Summary Discharge Monitoring Report for October 2014 – September 2018	D-1
ATTAC	CHMENT E: Safety Data Sheets	E-1

List of Tables

- Sources for Discharges to Outfall 03A048 1
- 2 Wastewater Treatment Codes Assigned to Outfall 03A048
- 3 List of Treatment Chemicals used in the Operations that Contribute to Outfall 03A048
- 4 Flow Rates and Frequencies for Discharges to Outfall 03A048
- Potential Pollutants by Source for Outfall 03A048 5
- 6 List of Independent Laboratories Used for NPDES Water Analysis



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2019 NPDES PERMIT RE-APPLICATION OUTFALL FACT SHEET – 03A048

1.0 OUTFALL LOCATION [Section I]

Outfall ID No.:	03A048	Outfall Location:	Technical Area 53
Category:	03A, Treated Cooling	Originating Structure	TA-53-963/964, TA-53-978/979
	Water Discharges	for the Discharge:	
Flow Type:	Intermittent	Receiving Stream: Ephemeral Tributary to Los Alamos Can	
			Quality Segment Number 20.6.4.128 NMAC
Longitude:	106°15′45″W	Latitude:	35°52′11″N

2.0 FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]

Outfall 03A048 is located at TA-53 and discharges to ephemeral tributary to Los Alamos Canyon in Water Quality Segment 20.6.4.128 NMAC. The outfall discharges treated cooling water that originates at TA-53-963, 964, 978, and 979. Attachment A provides a location map. The cooling tower blow-down is comprised of potable water treated by the cooling tower water treatment system. Table 1 identifies the discharge source, the source location, and source composition.

	Table 1						
	Sources for Discharges to Outfall 03A048						
TA	TA Building Transportation Mode Discharge Source Source Composition						
		(Piping, Truck etc.)	Description				
53	963, 964,	Piping	TA-53-963/964 (West) and	Treated Cooling Tower Blowdown			
	978, 979		978/979 (East) Cooling Towers	Potable water used as Makeup			

2.1 Process Schematic and Water Balance [II.A]

A process schematic line drawing that shows the route taken by water from intake to the discharge at Outfall 03A048 is provided in Attachment B. This drawing includes all operations that contribute cooling water to the discharge at Outfall 03A048. A water balance is also provided on the process schematic with average flows for the cooling tower intakes and blowdown. The water balance is based upon actual data collected from cooling tower operations personnel and the flow meter/totalizer associated with the outfall.

2.2 Water Treatment Processes [II.B]

Outfall 03A048 receives cooling tower blowdown from two sets of cooling towers (10) that serve the LANSCE Facilities.

- The five (5) West Cooling Towers located at TA-53-963 cool the magnets, targets, and other equipment along the beam line at LANSCE. These towers do not provide any building "comfort" cooling. The water treatment system for these towers is located in the adjacent building TA-53-964. It includes an automatic chemical feed system that is controlled by a programmable logic controller (PLC). The PLC reacts to conductivity meters, an arsenic meter, and a chlorine analyzer to add treatment chemicals, add makeup water, and/or blowdown the towers. The treatment chemicals include bromicide, corrosion inhibitor, and a de-chlorination chemical. The bromicide and corrosion inhibitor are added to the cooling water along with makeup water prior to being circulated through the cooling towers. The cooling loop includes a bag filter to reduce the amount of particulates that concentrates in the system as it is circulated through the loop and cooling tower. The de-chlorination chemical is added to the blowdown line.
- The five (5) East Cooling Towers located at TA-53-978 cool targets and other equipment along the beam line. These towers do not provide any building "comfort" cooling. The water treatment system for these towers is located in the adjacent building TA-53-979. It includes an automatic chemical feed system that is controlled by a PLC. The PLC reacts to conductivity meters and a chlorine analyzer to add treatment chemicals, add makeup water, and/or blowdown the towers. The treatment chemicals include bromicide, corrosion inhibitor, and a de-chlorination chemical. The bromicide and corrosion inhibitor are added to the cooling water along with makeup water prior to being circulated through the cooling towers. The cooling loop includes a bag filter to reduce the amount of particulates that concentrates in the system as it is circulated through the loop and cooling tower. The de-chlorination chemical is added to the blowdown line.



Table 2 identifies the wastewater treatment codes associated with the water treatment system. Attachment C provides photographs of the outfall, cooling towers, and the wastewater treatment equipment.

Table 2			
Wastewater Treatment Codes Assigned to Outfall 03A048			
Treatment Code Description Justification			
2-E	Dechlorination	Chlorine Scavenger Chemicals	
2-H	Disinfection (other)	Chemicals are added to Control Microorganisms	
2-L	Reduction	Chemicals that are Corrosion Inhibitors	

The water treatment processes identified in Table 2 utilize chemicals to control corrosion, limit biological growth, and dechlorinate blowdown prior to discharge. Table 3 provides a list of the chemicals used to treat the water in the cooling towers.

Table 3 List of Treatment Chemicals used in the Operations that Contribute to Outfall 03A048						
Source	Chemical Name	Reason for Use	Toxic Pollutant and/or Ha Substances Table 2C-3 (
TA-53-963/964 (West) and	Bromicide Tablets	Biocide	Bromo-chloro-5,5-dimethyl hydantoin (chlorine source)	2C-4		
978/979 (East)	WEST C-358	Corrosion Inhibitor	Sodium hydroxide	2C-4		
Cooling Towers	WEST R-630	De-Chlorination	Sodium bisulfite	2C-4		
	Bright Dyes FLT Yellow/Green Liquid	Water Line & Drain Tracing Dye	NA	NA		
	Bright Dyes FLT Yellow/Green Tablet	Water Line & Drain Tracing Dye	NA	NA		

2.3 Discharge Rate and Frequency [II.C]

The discharge rates and frequencies for Outfall 03A048 are provided in Table 4.

Table 4 Flow Rates and Frequencies for Discharges to Outfall 03A048							
Frequency Flow Rates and Volume					olumes		
Source ^a	Days/Week	Months	Average (MGD)	Maximum (MGD)	Average Volume (GPD)	Maximum Volume (GPD)	Duration (days)
TA-53-963/964 (West) and 978/979 (East) Cooling Towers	7	12	0.088	0.169	87,606	168,900	365

a. Calculated between October 2017 and September 2018.

GPD = gallons per day, MGD = million gallons per day

3.0 PRODUCTION [Section III]

Section III is not applicable to Outfall 03A048.

4.0 IMPROVEMENTS [Section IV]

Section IV is not applicable to Outfall 03A048.

5.0 INTAKE AND EFFLUENT CHARACTERISTICS [Section V]

5.1 Analytical Data [V.A, B, and C]

The analytical results provided for the Outfall 03A048 Permit Reapplication on the Form 2C were provided from the following sources:

Samples collected on August 13, 2018 were shipped to an independent laboratory for analysis.



- Field samples collected and analyzed on August 13, 2018 for temperature, residual chlorine, and pH.
- Field samples collected and analyzed on January 29, 2019 for sulfite.
- Discharge Monitoring Report Summary for Outfall 03A048 from October 2014 to September 2018 (Attachment D).
- Calculated Hardness = 126 mg/L (CaCO₃)

5.2 Potential Pollutants [V.D]

The treatment chemicals associated with the cooling tower water treatment system, and the potable water used for makeup water to the towers constitute the pollutant load of the discharge to Outfall 03A048. Table 5 identifies the Table 2C-3 and 2C-4 pollutants by discharge source. It also identifies those pollutants (if any) that were detected in the analytical results from the samples collected for the 2019 Permit Renewal Application.

Potential Pollutants	Table 5 by Source for Outfall 0	3A048	
Source Description	POTENTIA		Analytical Data
	Toxic Pollutant and/c Substances Table 2		Results
TA-53-963/964 (West) and 978/979 (East) Cooling	Sodium hydroxide	2C-4	pH = 6.9 – 8.9 S.U.
Tower	Sodium bisulfite	2C-4	Sulfite = 13.8 mg/L ^a
	Chlorine	2C-4	Residual Chlorine = 0
Potable water used as Makeup water	Chlorine	2C-4	Residual Chlorine = 0

a. Sulfite result may be artificially high because it was collected at a time of year when the cooling load on the towers was low.

The safety data sheets associated with the chemicals used at the cooling towers are provided in Attachment E.

6.0 POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]

Section VI is not applicable to Outfall 03A048.

7.0 BIOLOGICAL TOXICITY TESTING DATA [Section VII]

Section VII is not applicable to Outfall 03A048.

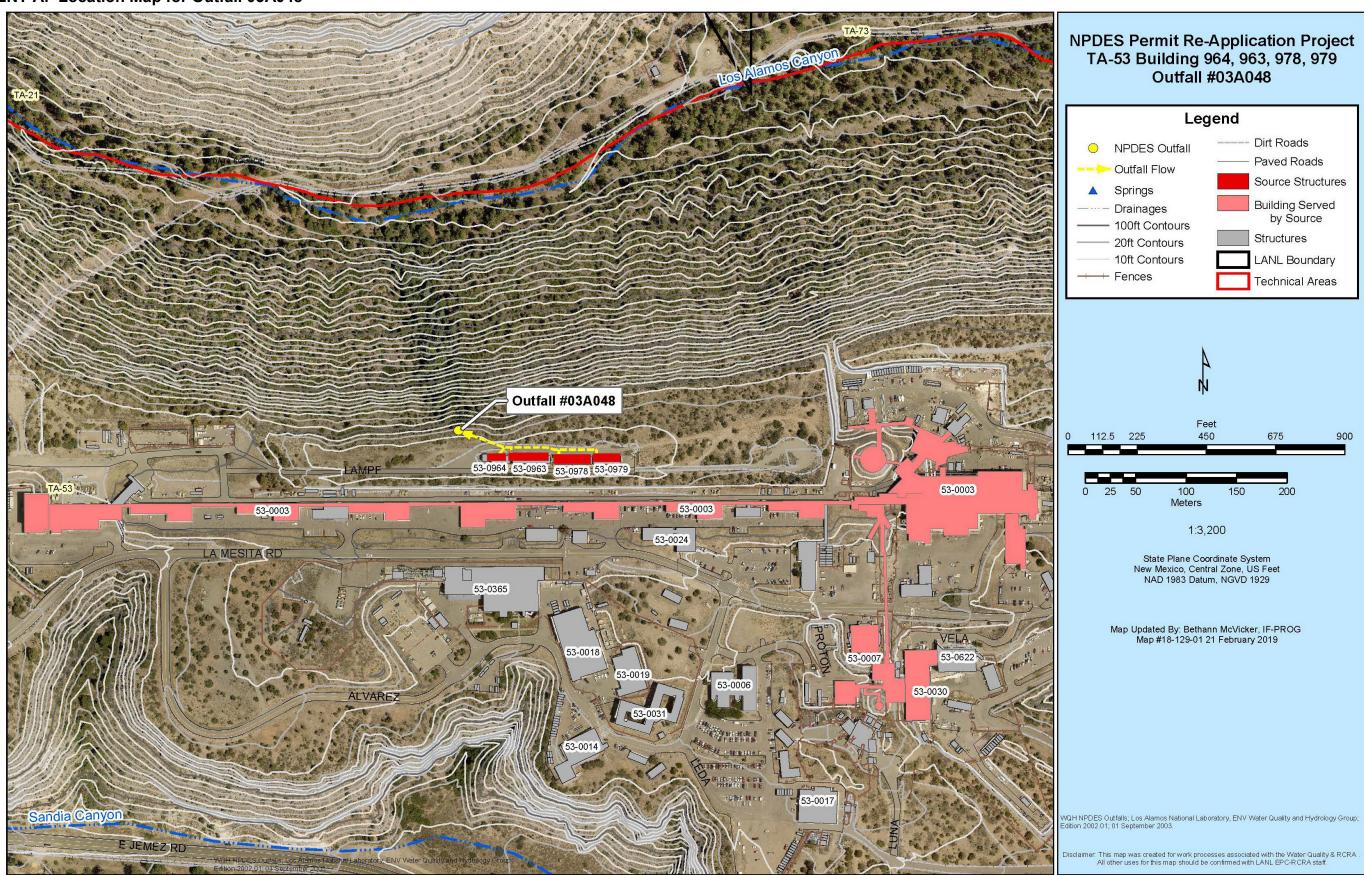
8.0 CONTRACT ANALYSIS INFORMATION [Section VIII]

Samples were collected from the cooling tower blowdown on August 13, 2018 for the Form 2C constituents required by the permit application forms. These samples were submitted to independent laboratories as summarized in Table 6.

		Table 6 ries Used for NPDES Water Analysis
Laboratory Name	Address and Contact Info	Analytes
GEL Laboratories LLC	2040 Savage Road Charleston SC 29407 (843) 556-8171	Biological Oxygen Demand, General Chemistry, Pesticides, Polychlorinated Biphenyls, Radiochemistry, Semi-volatile Organic Compounds, Total Metals, Total Suspended Solids, Volatile Organic Compounds
New Mexico Water Testing Laboratory, Inc.	401 North Coronado Ave Espanola, NM 87532 (505) 929-4545	E.coli
Cape Fear Analytical LLC	3306 Kitty Hawk Road Suite 120 Wilmington, NC 28405 (910) 795-0421	TCDD (Dioxin)

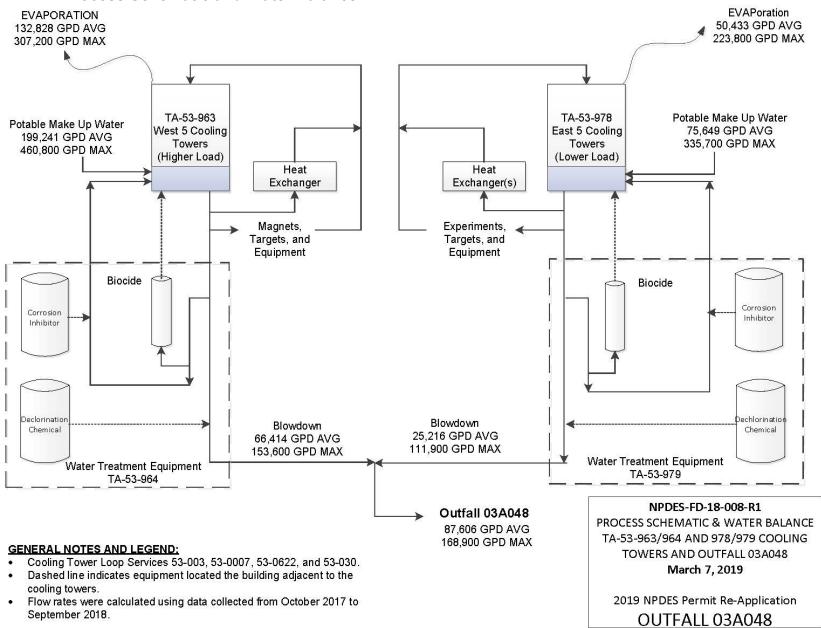


ATTACHMENT A: Location Map for Outfall 03A048





ATTACHMENT B: Process Schematic and Water Balance





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ATTACHMENT C: Photographs

Photograph ID No.	Photograph Title
NPDES-03A048-18-002	Outfall 03A048 Condition at Discharge Location
NPDES-03A048-18-003	Outfall 03A048 Accessibility
NPDES-03A048-18-004	Outfall 03A048 Receiving Stream Ephemeral Tributary to Los Alamos Canyon, Water QualitySegment Number 20.6.4.128 NMAC
NPDES-03A048-18-005	TA-53-963 Cooling Towers
NPDES-03A048-18-006	TA-53-963 Cooling Towers Corrosion Inhibitor and De-Chlorination Feed Tanks
NPDES-03A048-18-007	TA-53-963 Cooling Towers Brominator
NPDES-03A048-18-008	TA-53-978 Cooling Towers
NPDES-03A048-18-009	TA-53-978 Cooling Towers Corrosion Inhibitor and De-Chlorination Feed Tanks
NPDES-03A048-18-010	TA-53-978 Cooling Towers Brominator



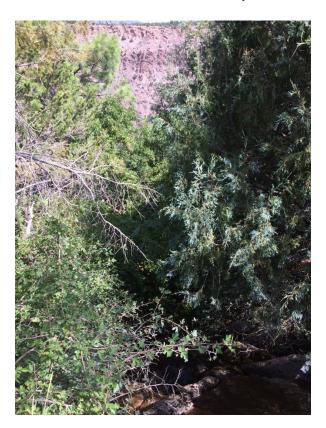
Photograph - NPDES-03A048-18-002 **Outfall 03A048 Condition at Discharge Location**

LA-UR-19-22215 **Attachment C** C-1 of 5





Photograph - NPDES-03A048-18-003 **Outfall 03A048 Accessibility**



Photograph - NPDES-03A048-18-004 **Outfall 03A048 Receiving Stream Ephemeral Tributary to** Los Alamos Canyon, Water Quality Segment Number 20.6.4.128 NMAC

LA-UR-19-22215 **Attachment C**





Photograph - NPDES-03A048-18-005 **TA-53-963 Cooling Towers**



Photograph - NPDES-03A048-18-006 **TA-53-963 Cooling Towers Corrosion Inhibitor and De-Chlorination Feed Tanks**

LA-UR-19-22215 Attachment C C-3 of 5





Photograph - NPDES-03A048-18-007 TA-53-963 Cooling Towers Brominator



Photograph - NPDES-03A048-18-008 TA-53-978 Cooling Towers





Photograph - NPDES-03A048-18-009
TA-53-978 Cooling Towers Corrosion Inhibitor and De-Chlorination Feed Tanks



Photograph - NPDES-03A048-18-010 TA-53-978 Cooling Towers Brominator



ATTACHMENT D: Summary Discharge Monitoring Report for October 2014 – September 2018

					Quantity or	Loading		Quality or 0	Concentratio	n						
					_									Number		
OUTFALL			Monitoring											of		
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples		Notes
03A048	TA-53-963, 964, 978, 979	2014	1	Flow (Totalized Est.)	0.075055	0.095000	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979			Flow (Totalized Est.)	0.076593	0.125500	MGD							30	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979			Flow (Totalized Est.)	0.060300	0.117000	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979			Flow (Totalized Est.)	0.080461	0.141000	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979		1	Flow (Totalized Est.)	0.028561	0.087500	MGD							28	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979			Flow (Totalized Est.)	0.009617	0.052800	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979		<u> </u>	Flow (Totalized Est.)	0.008767	0.029900	MGD							30	Daily	Require by Permit
03A048	· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	Flow (Totalized Est.)	0.010229	0.018200	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979			Flow (Totalized Est.)	0.030430	0.065500	MGD							30	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979			Flow (Totalized Est.)	0.024158	0.042900	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979			Flow (Totalized Est.)	0.054642	0.162800	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979			Flow (Totalized Est.)	0.149460	0.179900	MGD							30	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Oct	Flow (Totalized Est.)	0.112930	0.169900	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Nov	Flow (Totalized Est.)	0.103450	0.121400	MGD							30	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Dec	Flow (Totalized Est.)	0.054223	0.102900	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Jan	Flow (Totalized Est.)	0.089000	0.140200	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Feb	Flow (Totalized Est.)	0.131848	0.155000	MGD							29	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Mar	Flow (Totalized Est.)	0.045965	0.082800	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Apr	Flow (Totalized Est.)	0.010455	0.030500	MGD							30	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	May	Flow (Totalized Est.)	0.014019	0.026600	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Jun	Flow (Totalized Est.)	0.023600	0.036200	MGD							30	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Jul	Flow (Totalized Est.)	0.031357	0.053800	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979		Aug	Flow (Totalized Est.)	0.077471	0.102800	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979		Sept	Flow (Totalized Est.)	0.114460	0.139800	MGD							30	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Oct	Flow (Totalized Est.)	0.096713	0.131700	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979		Nov	Flow (Totalized Est.)	0.061877	0.087800	MGD							30	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Dec	Flow (Totalized Est.)	0.062355	0.104700	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979		Jan	Flow (Totalized Est.)	0.076142	0.112800	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979			Flow (Totalized Est.)	0.010318	0.090900	MGD							28	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979			Flow (Totalized Est.)	0.007640	0.048650	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979			Flow (Totalized Est.)	0.007397	0.036600	MGD							30	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979		· ·	Flow (Totalized Est.)	0.014610	0.022100	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979		•	Flow (Totalized Est.)	0.045490	0.149000	MGD							30	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979			Flow (Totalized Est.)	0.113790	0.204900	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979			Flow (Totalized Est.)	0.193230	0.210200	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979			Flow (Totalized Est.)	0.115317	0.206800	MGD							30	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979			Flow (Totalized Est.)	0.105145	0.142100	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979			Flow (Totalized Est.)	0.116967	0.142100	MGD							30	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979			Flow (Totalized Est.)	0.110307	0.140000	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979			Flow (Totalized Est.)	0.100042	0.109900	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979			Flow (Totalized Est.)	0.007108	0.015300	MGD							28	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979			Flow (Totalized Est.)	0.008636	0.013300	MGD							31	Daily	, ,
U3AU48		2010	iviai	TIOW (TOLATIZEU ESL.)	0.011464	0.042000	עטועו							31	Dally	Require by Permit



					Quantity or	Loading		Quality or C	Quality or Concentration							
OUTFALL No.	TA - Bldg.	Year	Monitoring Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Number of Samples	Frequency	Notes
03A048	TA-53-963, 964, 978, 979	2018		Flow (Totalized Est.)	0.025510	0.044900	MGD		71101460	17102/1110	<u> </u>		<u> </u>	30	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	•	Flow (Totalized Est.)	0.123506	0.160300	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	•	Flow (Totalized Est.)	0.114460	0.168900	MGD							30	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018		Flow (Totalized Est.)	0.094310	0.157300	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979			Flow (Totalized Est.)	0.143430	0.158600	MGD							31	Daily	Require by Permit
03A048	TA-53-963, 964, 978, 979			Flow (Totalized Est.)	0.126060	0.148300	MGD							30	Daily	Require by Permit
				Flow (Totalized Est.)		imum 30 Da	•		0.1932				mg/L	1,461	- /	
				Flow (Totalized Est.)			, <u> </u>			0.2102			mg/L	1,461		
03A048	TA-53-963, 964, 978, 979	2014	Oct	рН				7.8	****	8.7	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2014	Nov	рН				7.4	****	8.3	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2014	Dec	pH				8.3	****	8.8	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Jan	рН				7.7	****	8.9	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Feb	pH				7.4	****	8.8	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Mar	рН				7.5	****	8.2	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Apr	рН				6.9	****	8.1	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	May	рН				7.1	****	7.9	S.U.	6.0 - 9.0	S.U.	3.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Jun	рН				7.6	****	8.7	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Jul	рН				7.4	****	8.0	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Aug	pH				7.7	****	8.9	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Sept	pH				7.6	****	8.8	S.U.	6.0 - 9.0	S.U.	6.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Oct	pH				7.9	****	8.8	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Nov	pH				8.0	****	8.8	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Dec	рН				7.4	****	8.7	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Jan	рН				7.8	****	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Feb	pH				7.2	****	8.5	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Mar	рН				7.7	****	8.8	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Apr	рН				7.5	****	8.7	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	May	рН				8.0	****	8.8	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Jun	рН				7.6	****	8.7	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Jul	рН				7.7	****	8.9	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Aug	рН				7.4	****	8.3	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Sept	рН				7.0	****	7.8	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Oct	рН				7.8	****	8.4	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Nov	рН				8.0	****	8.9	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Dec	рН				6.9	****	8.9	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	Jan	рН				7.8	****	8.9	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	Feb	рН				7.8	****	8.7	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	Mar	рН				7.5	****	8.7	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	Apr	рН				7.0	****	7.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	May	рН				8.0	****	8.9	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	Jun	рН				8.4	****	8.9	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	Jul	рН				8.1	****	8.9	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	Aug	рН				7.8	****	8.2	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	Sept	рН				8.2	****	8.4	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit



					Quantity or	Loading		Quality or 0	Concentratio	n						
														Number		
OUTFALL			Monitoring											of		
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency	Notes
03A048	TA-53-963, 964, 978, 979	2017	Oct	pH				8.2	****	8.5	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979			pH				7.3	****	8.5	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017		pH				7.4	****	8.4	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018		рН				7.4	****	8.5	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018		рН				8.3	****	8.5	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018		pH				7.2	****	7.9	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018		рН				7.6	****	8.2	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	May	рН				7.7	****	8.3	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	Jun	рН				7.7	****	8.3	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	Jul	рН				7.8	****	8.4	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	Aug	рН				7.5	****	8.4	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	Sept	рН				7.8	***	8.4	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Require by Permit
				рН		ı	Minimum	6.9						209		
				рН	Max	imum 30 Day	y Average		8.7					209		
				рН		N	Maximum			8.9				209		
03A048	TA-53-963, 964, 978, 979	2014	Oct	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2014	Nov	Total Residual Chlorine				***	***	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2014	Dec	Total Residual Chlorine				***	***	0	mg/L	0.011	mg/L	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Jan	Total Residual Chlorine				***	***	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Feb	Total Residual Chlorine				***	***	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Mar	Total Residual Chlorine				***	***	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Apr	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	May	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	3.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Jun	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Jul	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Aug	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Sept	Total Residual Chlorine				****	****	0.05	mg/L	0.011	mg/L	6.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Oct	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Nov	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Dec	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Jan	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Feb	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Mar	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Apr	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	May	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979		•	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979		•	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit



					Quantity or	Loading		Quality or 0	Concentratio	n						
OUTFALL No.	TA - Bldg.	Year	Monitoring Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Number of Samples	Frequency	Notes
03A048	TA-53-963, 964, 978, 979	2017	Mar	Total Residual Chlorine	711-01-0-0-0			****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	•	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	Jul	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	Aug	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	Sept	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	Oct	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	Nov	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	Dec	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	Jan	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	Feb	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	Mar	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	Apr	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	May	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	Jun	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	Jul	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	Aug	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	Sept	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Require by Permit
				Total Residual Chlorine		Daily	Average		0.001					209		
				Total Residual Chlorine	Max	imum 30 Day	Average		0.000					209		
				Total Residual Chlorine		N	/laximum			0.000				209		
03A048	TA-53-963, 964, 978, 979	2014	Dec	Phosphorus, Total				****	0.127	0.127	mg/L	20 - 40	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Mar	Phosphorus, Total				****	0.191	0.191	mg/L	20 - 40	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Jun	Phosphorus, Total				****	0.108	0.108	mg/L	20 - 40	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Sept	Phosphorus, Total				****	0.104	0.104	mg/L	20 - 40	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Dec	Phosphorus, Total				****	<0.119	<0.119	mg/L	20 - 40	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Mar	Phosphorus, Total				****	0.161	0.161	mg/L	20 - 40	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Jun	Phosphorus, Total				****	0.183	0.183	mg/L	20 - 40	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Sept	Phosphorus, Total				****	0.192	0.192	mg/L	20 - 40	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Dec	Phosphorus, Total				****	0.133	0.133	mg/L	20 - 40	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	Mar	Phosphorus, Total				****	0.172	0.172	mg/L	20 - 40	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979			Phosphorus, Total				****	0.0797	0.0797	mg/L	20 - 40	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979		•	Phosphorus, Total				****	0.0683	0.0683	mg/L	20 - 40	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979			Phosphorus, Total				****	0.148	0.148	mg/L	20 - 40	mg/L	1	Quarterly	Require by Permit
03A048				Phosphorus, Total				****	0.146	0.146	mg/L	20 - 40	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979			Phosphorus, Total				****	0.105	0.105	mg/L	20 - 40	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	Sept	Phosphorus, Total				****	0.127	0.14	mg/L	20 - 40	mg/L	2	Quarterly	Require by Permit
				Phosphorus, Total		Daily	Average		0.136					17		
				Phosphorus, Total	Max	imum 30 Day	Average		0.192					17		
				Phosphorus, Total		N	/laximum			0.192				17		
03A048	TA-53-963, 964, 978, 979	2014	Dec	Total Suspended Solids				****	0.6	0.6	mg/L	30 - 100	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	Mar	Total Suspended Solids				****	<1.18	<1.18	mg/L	30 - 100	mg/L	1	Quarterly	Require by Permit



					Quantity or	Loading		Quality or 0	Concentratio	n						
														Number		
OUTFALL			Monitoring											of		
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency	Notes
03A048	TA-53-963, 964, 978, 979	2015		Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015	•	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2015		Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016		Total Suspended Solids				****	<1.14	<1.14	mg/L	30 - 100	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Jun	Total Suspended Solids				****	0.625	0.625	mg/L	30 - 100	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Sept	Total Suspended Solids				***	<5.7	<5.7	mg/L	30 - 100	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Dec	Total Suspended Solids				***	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	Mar	Total Suspended Solids				***	0.7	0.7	mg/L	30 - 100	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	Jun	Total Suspended Solids				***	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	Sept	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	Dec	Total Suspended Solids				***	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	Mar	Total Suspended Solids				***	5.9	5.9	mg/L	30 - 100	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	Jun	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	Sept	Total Suspended Solids				****	<0.591	<0.613	mg/L	30 - 100	mg/L	2	Quarterly	Require by Permit
				Total Suspended Solids		Daily	Average		2.0					17		
				Total Suspended Solids	Max	imum 30 Day	y Average		5.9					17		
				Total Suspended Solids		ľ	Maximum			5.9				17		
03A048	TA-53-963, 964, 978, 979	2015	Sept	Arsenic, Total				****	0.00284	0.00284	mg/L	0.013	mg/L	1	Yearly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Sept	Arsenic, Total				****	0.00426	0.00426	mg/L	0.013	mg/L	1	Yearly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	Sept	Arsenic, Total				****	0.00294	0.00294	mg/L	0.013	mg/L	1	Yearly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	Sept	Arsenic, Total				***	0.0062	0.00282	mg/L	0.013	mg/L	2	Yearly	Require by Permit
				Arsenic, Total		Daily	Average		0.004060					5		
				Arsenic, Total	Max	imum 30 Day	y Average		0.00620					5		
				Arsenic, Total		ľ	Maximum			0.00426				5		
03A048	TA-53-963, 964, 978, 979	2015	Sept	Copper, Dissolved				****	****	0.00127	mg/L	0.0233	mg/L	1	Yearly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Sept	Copper, Dissolved				****	****	0.00122	mg/L	0.0233	mg/L	1	Yearly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	Sept	Copper, Dissolved				****	****	0.00149	mg/L	0.0233	mg/L	1	Yearly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	Sept	Copper, Dissolved				***	****	0.00109	mg/L	0.0233	mg/L	1	Yearly	Require by Permit
				Copper		Daily	/ Average		0.0013					4		
				Copper	Max	imum 30 Day	/ Average		0.00149					4		
				Copper		N	Maximum			0.00149				4		
03A048	TA-53-963, 964, 978, 979	2015	Sept	Aluminum, Total				****	****	<0.015	mg/L	7.592	mg/L	1	Yearly	Require by Permit
03A048	TA-53-963, 964, 978, 979			Aluminum, Total				****	****	<0.015	mg/L	7.592	mg/L	1	Yearly	Require by Permit
03A048	TA-53-963, 964, 978, 979			Aluminum, Total				****	****	<0.0193	mg/L	7.592	mg/L	1	Yearly	Require by Permit
03A048	TA-53-963, 964, 978, 979		· · · · · · · · · · · · · · · · · · ·	Aluminum, Total				****	****	<0.0193	mg/L	7.592	mg/L	1	Yearly	Require by Permit
				Aluminum		Daily	/ Average		0.0000					4	-	
				Aluminum	Max	imum 30 Day			0					4		
				Aluminum			Maximum			0				4		
03A048	TA-53-963, 964, 978, 979	2015	Sept	Mercury, Dissolved				****	****	<0.067	mg/L	1.4	mg/L	1	Yearly	Require by Permit
03A048	TA-53-963, 964, 978, 979			Mercury, Dissolved				****	****	<0.067	mg/L	1.4	mg/L	1	Yearly	Require by Permit
03A048	TA-53-963, 964, 978, 979		•	Mercury, Dissolved				****	****	<0.067	mg/L	1.4	mg/L	1	Yearly	Require by Permit
03A048	TA-53-963, 964, 978, 979			Mercury, Dissolved				****	****	<0.067	mg/L	1.4	mg/L	1	Yearly	Require by Permit
				Mercury, Dissolved		Daily	/ Average		0.0000				<u> </u>	4	,	, ,
				, 2.000.700					3.0300					•		



					Quantity or	Loading		Quality or 0	Concentratio	n						
OUTFALL No.	TA - Bldg.	Year	Monitoring Period	Parameter		Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Number of Samples	Frequency	Notes
				Mercury, Dissolved		imum 30 Day			0					4	,	
				Mercury, Dissolved			// Jaximum			0				4		
03A048	TA-53-963, 964, 978, 979	2015	Sept	Mercury, Total				****	****	<0.067	mg/L	0.77	mg/L	1	Yearly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2016	Sept	Mercury, Total				****	****	<0.067	mg/L	0.77	mg/L	1	Yearly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2017	Sept	Mercury, Total				****	****	<0.067	mg/L	0.77	mg/L	1	Yearly	Require by Permit
03A048	TA-53-963, 964, 978, 979	2018	Sept	Mercury, Total				****	****	<0.067	mg/L	0.77	mg/L	2	Yearly	Require by Permit
				Mercury, Total		Daily	/ Average		0.0000					5		
				Mercury, Total	Max	imum 30 Day	/ Average		0					5		
				Mercury, Total		N	Naximum			0				5		
03A048	TA-53-963, 964, 978, 979	2015	Sept	Chromium VI				****	0.00717	0.00717	mg/L	Report	NA	1	Term	Require by Permit
				Chromium VI		Daily	/ Average							1		
				Chromium VI	Max	imum 30 Day	/ Average							1		
				Chromium VI		N	Naximum			0.00717				1		
03A048	TA-53-963, 964, 978, 979	2016	Sept	Adjusted Gross Alpha				****	0.597	0.597	pCi/L	Report	mg/L	1	Term	Require by Permit
				Mercury, Total		Daily	/ Average							1		
				Mercury, Total	Max	imum 30 Day	/ Average							1		
				Mercury, Total		N	Naximum			0.597				1		



ATTACHMENT E: Safety Data Sheets

LIST OF SAFETY DATA SHEETS
Bromicide Tablets
WEST C-358
WEST R-630
Bright Dyes FLT Yellow/Green Liquid
Bright Dyes FLT Yellow/Green Tablet



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BROMICIDE TABLETS

Revision date: 3/28/2016

Revision: 9



SAFETY DATA SHEET **BROMICIDE TABLETS**

1. Identification

Product identifier

Product name **BROMICIDE TABLETS**

Chemical name Bromo-chloro-5,5-dimethylhydantoin

100405, 100406, 100407, 100412, 100414, 100794, 101187 Product number

CAS number 32718-18-6

Recommended use of the chemical and restrictions on use Application Biocides for water treatment.

Details of the supplier of the safety data sheet

BWA Water Additives US LLC Supplier

1979 Lakeside Parkway Suite 925, Tucker, GA30084

USA

T: +1 800 600 4523 T: +1 678 802 3050

E: msds@wateradditives.com

Emergency telephone number

Emergency telephone CHEMTREC Phone: 1-800-424-9300

2. Hazard(s) identification

Classification of the substance or mixture

Physical hazards Ox. Sol. 3 - H272

Health hazards Acute Tox. 4 - H302 Skin Corr. 1C - H314 Eye Dam. 1 - H318 Skin Sens. 1 - H317

Environmental hazards Aquatic Acute 1 - H400

Label elements

Pictogram









Signal word

Danger

Hazard statements H272 May intensify fire; oxidizer.

H302 Harmful if swallowed.

H314 Causes severe skin burns and eye damage.

H317 May cause an allergic skin reaction.

H400 Very toxic to aquatic life.



Revision date: 3/28/2016 Revision: 9

BROMICIDE TABLETS

Precautionary statements P210 Keep away from heat, sparks, open flames and hot surfaces. No smoking.

P220 Keep away from combustible materials.

P221 Take any precaution to avoid mixing with combustibles.

P260 Do not breathe vapor/ spray. P261 Avoid breathing vapor/ spray.

P264 Wash contaminated skin thoroughly after handling. P270 Do not eat, drink or smoke when using this product.

P272 Contaminated work clothing must not be allowed out of the workplace.

P273 Avoid release to the environment.

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

P301+P310 If swallowed: Immediately call a poison center/ doctor. P301+P330+P331 If swallowed: Rinse mouth. Do NOT induce vomiting.

P302+P352 If on skin: Wash with plenty of water.

P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse

skin with water/ shower.

P304+P340 If inhaled: Remove person to fresh air and keep comfortable for breathing.

P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact

lenses, if present and easy to do. Continue rinsing.

P321 Specific treatment (see medical advice on this label).

P333+P313 If skin irritation or rash occurs: Get medical advice/ attention. P362+P364 Take off contaminated clothing and wash it before reuse.

P363 Wash contaminated clothing before reuse.

P370+P378 In case of fire: Use foam, carbon dioxide, dry powder or water fog to extinguish.

P391 Collect spillage. P405 Store locked up.

P501 Dispose of contents/ container in accordance with national regulations.

Contains Bromo-chloro-5,5-dimethylhydantoin

3. Composition/information on ingredients

Mixtures

Bromo-chloro-5,5-dimethylhydantoin

96.0%

CAS number: 32718-18-6
M factor (Acute) = 1

Classification

Ox. Sol. 3 - H272 Acute Tox. 4 - H302 Skin Corr. 1C - H314 Eye Dam. 1 - H318 Skin Sens. 1 - H317 Aquatic Acute 1 - H400

Inert ingredients

4.0%

CAS number: —

Classification

Not Classified

The Full Text for all Hazard Statements are Displayed in Section 16.

Composition comments 1-bromo-3-chloro-5,5-dimethylhydantoin



Revision date: 3/28/2016 Revision: 9

BROMICIDE TABLETS

4. First-aid measures

Description of first aid measures

Inhalation Move affected person to fresh air and keep warm and at rest in a position comfortable for

breathing. Get medical attention. Show this Safety Data Sheet to the medical personnel.

Ingestion Do not induce vomiting. Give plenty of water to drink. Rinse mouth thoroughly with water.

Never give anything by mouth to an unconscious person. Get medical attention. Show this

Safety Data Sheet to the medical personnel.

Skin Contact Remove contaminated clothing. Rinse immediately with plenty of water. Continue to rinse for

at least 15 minutes. Get medical attention. Show this Safety Data Sheet to the medical

personnel.

Eye contact Rinse immediately with plenty of water. Remove any contact lenses and open eyelids wide

apart. Continue to rinse for at least 15 minutes. Get medical attention. Show this Safety Data

Sheet to the medical personnel.

Most important symptoms and effects, both acute and delayed

Inhalation Dust may irritate the respiratory system.

Ingestion May cause stomach pain or vomiting. May cause chemical burns in mouth and throat. Due to

the physical nature of this material it is unlikely that swallowing will occur.

Skin contact Chemical burns. Burning pain and severe corrosive skin damage.

Eye contact Severe irritation, burning and tearing.

Indication of immediate medical attention and special treatment needed

Notes for the doctor If lavage is performed suggest endotracheal and/or esophageal control.Danger from lung

aspiration must be weighed against toxicity when considering emptying the stomach. The decision of whether to induce vomiting or not should be made by a physician. Chemical eye burns may require extended irrigation. Obtain prompt consultation preferably from an opthalmologist. If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical

condition of the patient.

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media Extinguish with the following media: Water spray, fog or mist. Alcohol-resistant foam.

Unsuitable extinguishing

media

Carbon dioxide (CO2). Dry chemicals.

Special hazards arising from the substance or mixture

Specific hazards Toxic gases/vapors/fumes of: Bromine. Chlorine. Oxides of the following substances: Carbon.

Nitrogen. Thermal decomposition or combustion products may include the following

substances: Toxic gases or vapors.

Advice for firefighters

Protective actions during

firefighting

Move containers from fire area if it can be done without risk. Control run-off water by

containing and keeping it out of sewers and watercourses.

Special protective equipment

for firefighters

Leave danger zone immediately. Wear positive-pressure self-contained breathing apparatus

(SCBA) and appropriate protective clothing.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures



Revision date: 3/28/2016 Revision: 9

BROMICIDE TABLETS

Personal precautions Follow precautions for safe handling described in this safety data sheet. For personal

protection, see Section 8.

Environmental precautions

Environmental precautions Avoid release to the environment. To prevent release, place container with damaged side up.

Methods and material for containment and cleaning up

Methods for cleaning up Provide adequate ventilation. Contain spillage with sand, earth or other suitable non-

combustible material. Avoid the spillage or runoff entering drains, sewers or watercourses. Collect spillage for reclamation or disposal in sealed containers via a licensed waste contractor. Containers with collected spillage must be properly labeled with correct contents and hazard symbol. Wash thoroughly after dealing with a spillage. Avoid generation and

spreading of dust. Avoid contact with water.

Reference to other sections For personal protection, see Section 8. For waste disposal, see section 13.

7. Handling and storage

Precautions for safe handling

Usage precautions Provide adequate ventilation. Avoid inhalation of vapors. Use approved respirator if air

contamination is above an acceptable level. Do not use in confined spaces without adequate ventilation and/or respirator. Avoid spilling. Avoid contact with skin and eyes. Avoid contact with the following materials: Acids. Moisture. Avoid handling which leads to dust formation.

Conditions for safe storage, including any incompatibilities

Storage precautions Store in tightly-closed, original container in a dry, cool and well-ventilated place. Keep

container tightly closed. Protect from light. Keep away from heat, sparks and open flame.

Store away from the following materials: Reducing agents.

Storage class Oxidizer storage.

Specific end uses(s)

Specific end use(s) The identified uses for this product are detailed in Section 1.2.

8. Exposure Controls/personal protection

Ingredient comments No exposure limits known for ingredient(s)

Exposure controls

Protective equipment





Appropriate engineering controls

All handling should only take place in well-ventilated areas.

Eye/face protection

The following protection should be worn: Chemical splash goggles or face shield.

Hand protection

Selection of a suitable glove depends on work conditions and whether the product is present on its own or in combination with other substances. Wear protective gloves made of the following material: Butyl rubber. Neoprene. Nitrile rubber. Polyethylene. Polyvinyl chloride (PVC). Gloves should be replaced immediately if signs of degradation are observed.

Other skin and body protection

Wear appropriate clothing to prevent any possibility of skin contact. Wear a suitable dust

mask. Wear apron or protective clothing in case of contact.



Revision date: 3/28/2016 Revision: 9

BROMICIDE TABLETS

Hygiene measures Use engineering controls to reduce air contamination to permissible exposure level. Provide

eyewash station. No specific hygiene procedures recommended but good personal hygiene practices should always be observed when working with chemical products. Contaminated

clothing should be placed in a closed container for disposal or decontamination.

Respiratory protection Wear a suitable dust mask

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Appearance Tablet

Color White/off-white. Odor Slight. Halogen

Odor threshold Not available. Not available.

pH (diluted solution): 3.5 @ 0.15 %

Melting point 156 - 162°C Initial boiling point and range Not known.

Freezing Point

Flash point Not applicable. Evaporation rate Not known. Evaporation factor Not applicable. Upper/lower flammability or Not available.

explosive limits

0.0038 Pa @ °C Vapor pressure Vapor density Not available Not applicable. Relative density

Bulk density 0.9 kg/l

Solubility(ies) 0.15 @ °C Slightly soluble in water.

Partition coefficient log Pow: 0.35 Auto-ignition temperature Not available Viscosity Not known.

Explosive properties There are no chemical groups present in the product that are associated with explosive

properties.

Oxidizing properties The product contains a substance classified as oxidizing. Keep away from flammable and

combustible materials.

Molecular weight 241.47

Molecular Formula C5 H6 Br Cl N2 O2

10. Stability and reactivity

Reactivity This material has oxidising properties.

Stability Stable at normal ambient temperatures. Avoid the following conditions: Moisture.



Revision date: 3/28/2016 Revision: 9

BROMICIDE TABLETS

Possibility of hazardous

reactions

Will not polymerize.

Conditions to avoid Generates toxic gas in contact with acid. Avoid excessive heat for prolonged periods of time.

Avoid heat, flames and other sources of ignition.

Materials to avoid Strong acids. Strong reducing agents. Strong alkalis.

Hazardous decomposition

products

Toxic gases/vapors/fumes of: Hydrogen bromide (HBr). Bromine. Hydrogen chloride (HCl).

Chlorine. Oxides of the following substances: Carbon. Nitrogen.

11. Toxicological information

Information on toxicological effects

Toxicological effects Ames Test negative

Other health effects There is no evidence that the product can cause cancer.

Supplemental Toxicological

Information

Acute toxicity - oral

Acute toxicity oral (LD₅

mg/kg)

578.0

Species Rat
ATE oral (mg/kg) 520.83

Acute toxicity - dermal

Acute toxicity dermal (LDso

mg/kg)

2,000.0

Species Rabbit

Germ cell mutagenicity

Genotoxicity - in vitro Ames test: Negative.

Inhalation May cause respiratory system irritation.

Ingestion Harmful if swallowed.

Skin Contact Causes burns. May cause sensitisation by skin contact.

Eye contact Causes burns.

Acute and chronic health

hazards

Causes severe burns. May cause sensitisation by skin contact.

Routs of entry Skin and/or eye contact Ingestion.

12. Ecological Information

Ecotoxicity The product contains a substance which is very toxic to aquatic organisms.

Toxicity

Acute toxicity - fish LC50, 96 hours: 0.87 mg/l, Onchorhynchus mykiss (Rainbow trout)

LC50, 96 hours: 0.87 mg/l, Fish



Revision date: 3/28/2016 Revision: 9

BROMICIDE TABLETS

Acute toxicity - aquatic invertebrates

EC₅₀, 48 hours: 0.46 mg/l, Daphnia magna EC₅₀, 48 hours: 0.46 mg/l, Daphnia magna

Persistence and degradability

Persistence and degradability

Halogens will dissociate in water leaving DMH. DMH is readily biodegradable in a CO2 Evolution study and passes the 10-day window criteria. DMH has also been shown to be

rapidly degraded in a water/sediment system.

Chemical oxygen demand

1.005 g O₂/g substance

Bioaccumulative potential

Bio-Accumulative Potential

Low bioaccumulation potential

Partition coefficient

log Pow: 0.35

Mobility in soil

Mobility

No information available.

Results of PBT and vPvB assessment

Results of PBT and vPvB

assessment

This substance is not classified as PBT or vPvB according to current EU criteria.

Other adverse effects

Acute Toxicity. Lc50 96 Hours, >640 American Oyster

Mg/L

13. Disposal considerations

Waste treatment methods

General information When handling waste, the safety precautions applying to handling of the product should be

considered

Disposal methods Dispose of waste to licensed waste disposal site in accordance with the requirements of the

local Waste Disposal Authority. Absorb in vermiculite, dry sand or earth and place into containers. Dispose of waste via a licensed waste disposal contractor. Liquid material should be incinerated. Material absorbed onto sand or earth should be disposed of as solid waste in accordance with local regulations. Empty packaging may contain product residues and due

consideration should be given prior to disposal.

Waste class 07 01 99

14. Transport information

UN Number

UN No. (TDG) 3085 UN No. (IMDG) 3085 UN No. (ICAO) 3085 UN No. (DOT) 3085

UN proper shipping name

Proper shipping name (TDG) OXIDISING SOLID, CORROSIVE, N.O.S., (contains bromo-chloro-dimethylhydantoin) 5.1(8),

PGIII, MARINE POLLUTANT

Proper shipping name (IMDG) OXIDISING SOLID, CORROSIVE, N.O.S., (contains bromo-chloro-dimethylhydantoin) 5.1(8),

PGIII, MARINE POLLUTANT



Revision date: 3/28/2016 Revision: 9

BROMICIDE TABLETS

Proper shipping name (ICAO) OXIDISING SOLID, CORROSIVE, N.O.S., (contains bromo-chloro-dimethylhydantoin) 5.1(8),

PGIII, MARINE POLLUTANT

Proper shipping name (DOT) OXIDISING SOLID, CORROSIVE, N.O.S., (contains bromo-chloro-dimethylhydantoin) 5.1(8),

PGIII, MARINE POLLUTANT

Transport hazard class(es)

TDG class 5.1+8 TDG label(s) 5.1+8 **IMDG Class** 5.1+8 ICAO class/division 5.1 ICAO subsidiary risk 8

Transport labels





Packing group

TDG Packing Group 111 IMDG packing group 111 ICAO packing group Ш DOT packing group Ш

Environmental hazards

Environmentally Hazardous Substance



Special precautions for user

EmS F-A, S-Q

Annex II of MARPOL 73/78

Transport in bulk according to Not applicable.

and the IBC Code

Classification Code (Adr) OC2

15. Regulatory information

Regulatory Status This chemical is a pesticide product registered by the Environmental Protection Agency and is

> subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label: DANGER Avoid contact with eyes, skin and clothing. EPA Reg. No.

83451-4

Regulatory References 29 CFR 1910.1010 Federal Regulations (OSHA Standard)

PMRA PCP No. 31855 Canadian Regulatory Status



Revision date: 3/28/2016 Revision: 9

BROMICIDE TABLETS

16. Other information

General information For advice on chemical emergencies, spillages, fires or first aid in relation to this product

please contact the relevant emergency number below: EU/English Speakers - +44 (0) 1235 239 670 (NCEC) Arabic Speakers - +44 (0) 1235 239 671 Asia/Pacific countries - +65 3158

1074 Within Mainland China: +86 532 8388 9090 (NRCC).

To/From China: +86 10 5100 3039 (NCEC)

Revision comments Section 15 revision, added US regulatory status and EPA Reg. No.

Issued by BWA Water Additives Regulatory Group, +44(0)1618646699

Revision date 3/28/2016

Revision 9

SDS No. 11306

Hazard statements in full H272 May intensify fire; oxidizer.

H302 Harmful if swallowed.

H314 Causes severe skin burns and eye damage.

H317 May cause an allergic skin reaction. H318 Causes serious eye damage. H400 Very toxic to aquatic life.

KIWA Certification

NSF Non Food Program
NSF/ANSI Standard 60

For safety reasons it is IMPERATIVE that customers:-

^{1.} Ensure that all those within their control who use the products are supplied with all relevant information contained within the Safety Data Sheet and Technical Bulletin concerning the applications for which the product is designed and any instructions and warnings contained therein.

^{2.} Consult BWA Water Additives before using or supplying the product for any other applications. The information contained herein is based on the present state of our knowledge and is intended to describe our products from the point of view of safety requirements. It should not therefore be construed as guaranteeing specific properties.



WEST -358





HMIS RATING: HEALTH 2 FLAMMABILITY 0 REACTIVITY 0 OTHER C

Safety Data Sheet WEST C-358

SECTION 1: Identification

1.1 Product identifier

Product name WEST C-358 Cooling Tower Inhibitor

Product number C-358

1.2 Recommended use An aqueous corrosion and scale inhibitor. This product is designed

specifically for the control of corrosion and mineral scales in open

circulating cooling water systems.

1.3 Supplier's details

Name Water & Energy Systems Technology, Inc.

Address 13109 Arctic Cr.

Santa Fe Springs, CA 90670

Telephone (562) 921-5191

1.4 Emergency phone number(s) Chem-Tel (U.S.): (800) 255-3924

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

GHS classification in accordance with OSHA (29 CFR 1910.1200)

- Skin corrosion/irritation (chapter 3.2), Cat. 1A
- Eye damage/irritation (chapter 3.3), Cat. 1
- Corrosive to metals (chapter 2.16), Cat. 1

2.2 GHS label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)

H290 May be corrosive to metals
H302 Harmful if swallowed

H314 Causes severe skin burns and eye damage

H332 Harmful if inhaled

Precautionary statement(s)

P260 Do not breathe fume/gas/mist/vapors/spray.
P264 Wash hands thoroughly after handling.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 1 of 6



P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse

skin with water/shower.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove

contact lenses if present and easy to do. Continue rinsing. Call a POISON CENTER or doctor/physician if you feel unwell. Store in a corrosive resistant container with a resistant inner liner.

SECTION 3: Composition/information on ingredients

Mixtures 3.1

P312

P406

Hazardous components

1. Sodium Hydroxide

Concentration 10 - 15 % (Weight)

CAS no. 1310-73-2

2. Azole Salts

Concentration 1 - 5 % (Weight)

CAS no. NA

Trade secret statement (OSHA 1910.1200(i))

Specific chemical identity and/or exact percentage of composition has been withheld as a trade secret.

SECTION 4: First-aid measures

Description of necessary first-aid measures

General advice Avoid contact with skin, eyes and clothing. Wash hands before breaks and

immediately after handling the product.

If inhaled Remove to fresh air. If not breathing, give artificial respiration. Get immediate

medical attention.

In case of skin contact Immediately remove clothing under safety shower. Flush skin with large

amounts of soap and water. Wash clothing separately before reuse.

In case of eye contact Flush eye with water for 15 minutes. Get medical attention.

If swallowed Do NOT induce vomiting. Give victim large quantities of water. Call a

physician or poison control center immediately. Never give anything by

mouth to an unconscious person.

4.2 Most important symptoms/effects, acute and delayed

ACUTE: Multiple small burns can result from exposure.

CHRONIC: Death may occur if penetration into vital areas occurs. Scarring may so constrict or destroy damaged

tissue that extensive corrective surgery may be required.

SECTION 5: Fire-fighting measures

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 2 of 6



5.1 Suitable extinguishing media

No data available.

5.2 Specific hazards arising from the chemical

No data available.

5.3 Special protective actions for fire-fighters

No special fire fighting procedures.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

See section 8.

6.2 Environmental precautions

Do not flush to sewer, drains, or surface waters.

6.3 Methods and materials for containment and cleaning up

Clean up spills immediately, observing precautions in Exposure Protection section of this SDS. Flush with a water spray. Pick up wash liquid with absorbent or vacuum and place in a disposable container. Large spills should be handled according to a predetermined plan.

SECTION 7: Handling and storage

Precautions for safe handling

Use with adequate ventilation. Follow all SDS/label precautions even after container is emptied because they may retain product residues.

7.2 Conditions for safe storage, including any incompatibilities

Contents may develop pressure upon prolonged storage. Loosen closure cautiously before opening.

Specific end use(s)

No data available.

SECTION 8: Exposure controls/personal protection

Control parameters 8.1

1. Sodium hydroxide (CAS: 1310-73-2)

PEL (Inhalation): 2 mg/m3 Ceiling (OSHA) TLV (Inhalation): 2 mg/m3 Ceiling (ACGIH)

8.2 Appropriate engineering controls

Local exhaust ventilation may be necessary to control any air containments to within their PELs (TLVs) during the use of this product.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear safety glasses with side shields (or goggles) and a face shield.

Skin protection

Nitrile rubber, PVC, or Neoprene gloves are suitable protective materials.

Body protection

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 3 of 6

LA-UR-19-22215 Attachment E



Where splashing is possible, full chemically resistant protective clothing, rubber apron and boots are required.

Respiratory protection

NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited.

Thermal hazards

No data available.

Environmental exposure controls

No data available.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance/form Amber or Yellow Liquid

Bland Odor рН 12.0

Melting point/freezing point No data available.

Initial boiling point and boiling range >212 F

Flash point No data available. Evaporation rate <1 (butyl acetate = 1) No data available. Flammability (solid, gas) Vapor pressure No data available. Vapor density No data available.

Relative density 1.102

Water Soluble Solubility(ies)

SECTION 10: Stability and reactivity

10.1 Reactivity

No data available.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available.

10.4 Conditions to avoid

Do not mix with other industrial chemicals.

10.5 Incompatible materials

Acids, oxidizing materials, halogen compounds, copper, zinc and galvanized metals.

10.6 Hazardous decomposition products

Carbon monoxide, carbon dioxide, ammonia, and oxides of nitrogen.

SECTION 11: Toxicological information

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 4 of 6



Information on toxicological effects

Acute toxicity

No data available.

Skin corrosion/irritation

No data available.

Serious eye damage/irritation

No data available.

Respiratory or skin sensitization

No data available.

Germ cell mutagenicity

No data available.

Carcinogenicity

This product's ingredients are not found in the federal or Cal OSHA NTP, or IARC lists of suspected cancer causing

Reproductive toxicity

No data available.

STOT-single exposure

No data available.

STOT-repeated exposure

No data available.

Aspiration hazard

No data available.

SECTION 12: Ecological information

Toxicity

No data available.

Persistence and degradability

No data available.

Bioaccumulative potential

No data available.

Mobility in soil

No data available.

Results of PBT and vPvB assessment

No data available.

SECTION 13: Disposal considerations

Disposal of the product

Dispose of all waste in accordance with federal, state, and local regulations.

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 5 of 6

LA-UR-19-22215 Attachment E



Disposal of contaminated packaging

Dispose of as unused product.

Waste treatment

No data available.

Sewage disposal

No data available.

SECTION 14: Transport information

DOT (US)

UN Number: UN 1719 Class: 8 Packing Group: II

Proper Shipping Name: CAUSTIC ALKALI LIQUID, N.O.S.

Marine pollutant: No Shipping Label: Corrosive - 8

Other Shipping Information: CONTAINS SODIUM HYDROXIDE, LIQUID



SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)
FIRE: NO PRESSURE GENERATING: NO REACTIVITY: NO ACUTE: YES CHRONIC: NO

SECTION 16: Other information

Further information/disclaimer

The information contained herein is provided in good faith and believed to be correct as of the date hereof. WEST, Inc. makes no representation as to the comprehensiveness or accuracy of the information. It is expected that the individuals receiving the information will exercise their independent judgment in determining its appropriateness for a particular purpose. Accordingly, WEST, Inc. will not be responsible for damages of any kind resulting in the use of or reliance upon such information. No representations, or warranties, either expressed or implied, of merchantability fitness for a particular purpose or of any other nature are made hereunder with respect to the information set fourth herein or to the product to which the information refers.

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 6 of 6



WEST R-630





HMIS RATING: HEALTH 1 FLAMMABILITY 0 REACTIMTY 0 OTHER C

Safety Data Sheet WEST R-630

SECTION 1: Identification

1.1 Product identifier

Product name WEST R-630 Sulfite

Product number R-630

1.2 Recommended use An aqueous solution of sodium and potassium sulfites, bisulfites and

metabisulfites designed specifically for halogen removal in process water

systems.

1.3 Supplier's details

Name Water & Energy Systems Technology, Inc.

Address 13109 Arctic Cr.

Santa Fe Springs, CA 90670

Telephone (562) 921-5191

1.4 Emergency phone number(s) Chem-Tel (U.S.): (800) 255-3924

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

GHS classification in accordance with OSHA (29 CFR 1910.1200)

- Skin corrosion/irritation (chapter 3.2), Cat. 3

- Eye damage/irritation (chapter 3.3), Cat. 2B

2.2 GHS label elements, including precautionary statements

Signal word	Warning
Hazard statement(s) H316 H320	Causes mild skin irritation Causes eye irritation
Precautionary statement(s) P332+P313 P264 P305+P351+P338	If skin irritation occurs: Get medical advice/attention. Wash hands thoroughly after handling. IF IN EYES: Rinse cautiously with water for several minutes. Remove
P337+P313	contact lenses if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

SECTION 3: Composition/information on ingredients

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 1 of 6



Mixtures 3.1

This product does not contain any hazardous materials under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

Trade secret statement (OSHA 1910.1200(i))

Specific chemical identity and/or exact percentage of composition has been withheld as a trade secret.

SECTION 4: First-aid measures

Description of necessary first-aid measures

General advice Avoid contact with skin, eyes and clothing. Wash hands before breaks and

immediately after handling the product.

If inhaled Remove to fresh air. If not breathing, give artificial respiration. Get immediate

medical attention.

In case of skin contact Immediately remove clothing under safety shower. Flush skin with large

amounts of soap and water. Wash clothing separately before reuse.

In case of eye contact Flush eye with water for 15 minutes. Get medical attention.

If swallowed Do NOT induce vomiting. Give victim large quantities of water. Call a

physician or poison control center immediately.

Personal protective equipment for first-aid responders

No data available.

Most important symptoms/effects, acute and delayed

No data available.

Indication of immediate medical attention and special treatment needed, if necessary

No data available.

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

No data available.

5.2 Specific hazards arising from the chemical

No data available.

Special protective actions for fire-fighters 5.3

No special fire fighting procedures.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures 6.1

Wear appropriate personal protective equipment as specified in Section 8.

6.2 Environmental precautions

Do not flush to sewer.

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 2 of 6



6.3 Methods and materials for containment and cleaning up

No data available.

SECTION 7: Handling and storage

Precautions for safe handling

Use with adequate ventilation. Follow all SDS/label precautions even after container is emptied because they may retain product residues.

7.2 Conditions for safe storage, including any incompatibilities

Contents may develop pressure upon prolonged storage. Loosen closure cautiously before opening.

SECTION 8: Exposure controls/personal protection

Control parameters

No exposure limits noted for ingredient(s).

8.2 Appropriate engineering controls

Local exhaust ventilation may be necessary to control any air containments to within their PELs (TLVs) during the use of this product.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear safety glasses with side shields (or goggles) and a face shield.

Skin protection

Nitrile rubber, PVC, or Neoprene gloves are suitable protective materials.

Body protection

Where splashing is possible, full chemically resistant protective clothing, rubber apron and boots are required.

Respiratory protection

NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited.

Thermal hazards

No data available.

Environmental exposure controls

No data available.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance/form Clear pink liquid Odor No appreciable odor. Odor threshold No data available. Hq ~6.5

Melting point/freezing point No data available.

Initial boiling point and boiling range 212 F

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 3 of 6

LA-UR-19-22215 Attachment E



Water Soluble

Flash point No data available. Evaporation rate <1 (butyl acetate = 1) Flammability (solid, gas) No data available. Vapor pressure No data available. Vapor density No data available. 1.251

Relative density Solubility(ies)

Partition coefficient: n-octanol/water No data available. Auto-ignition temperature No data available. Decomposition temperature No data available. No data available. Viscosity

No data available. Explosive properties Oxidizing properties No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

No data available.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available.

10.4 Conditions to avoid

Generation of heat by reaction with water or acids.

10.5 Incompatible materials

Acids, oxidizing materials, halogen compounds, copper, zinc and galvanized metals.

10.6 Hazardous decomposition products

Carbon monoxide, carbon dioxide, ammonia, and oxides of nitrogen.

SECTION 11: Toxicological information

Information on toxicological effects

Acute toxicity

No data available.

Skin corrosion/irritation

No data available.

Serious eye damage/irritation

No data available.

Respiratory or skin sensitization

No data available.

Germ cell mutagenicity

No data available.

Carcinogenicity

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 4 of 6



This product's ingredients are not found in the federal or Cal OSHA NTP, or IARC lists of suspected cancer causing agents.

Reproductive toxicity

No data available.

STOT-single exposure

No data available.

STOT-repeated exposure

No data available.

Aspiration hazard

No data available.

SECTION 12: Ecological information

Toxicity

No data available.

Persistence and degradability

No data available.

Bioaccumulative potential

No data available.

Mobility in soil

No data available.

Results of PBT and vPvB assessment

No data available.

SECTION 13: Disposal considerations

Disposal of the product

Dispose of all waste in accordance with federal, state, and local regulations.

Disposal of contaminated packaging

Dispose of as unused product.

Waste treatment

No data available.

Sewage disposal

No data available.

SECTION 14: Transport information

DOT (US)

Proper Shipping Name: D.O.T. NONREGULATED WATER TREATMENT LIQUID COMPOUND

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 5 of 6



SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)
FIRE: NO PRESSURE GENERATING: NO REACTIVITY: NO ACUTE: YES CHRONIC: NO

SECTION 16: Other information

Further information/disclaimer

The information contained herein is provided in good faith and believed to be correct as of the date hereof. WEST, Inc. makes no representation as to the comprehensiveness or accuracy of the information. It is expected that the individuals receiving the information will exercise their independent judgment in determining its appropriateness for a particular purpose. Accordingly, WEST, Inc. will not be responsible for damages of any kind resulting in the use of or reliance upon such information. No representations, or warranties, either expressed or implied, of merchantability fitness for a particular purpose or of any other nature are made hereunder with respect to the information set fourth herein or to the product to which the information refers.

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 6 of 6



BRIGHT DYES FLT YELLOW/GREEN LIQUID





Safety Data Sheet

Issue Date: 04-Oct-2013 Revision Date: 06-Feb-2017 Version Number: 1.1

1. Identification

Product Identifiers

Product Name: Bright Dyes® FLT Yellow/Green Liquid

Product Number: 106001

Recommended Use & Restrictions on Use

Water tracing & leak detection dye

Manufacturer/Supplier

Kingscote Chemicals, Inc. 3334 South Tech Blvd. Miamisburg, OH 45342 U.S.A.

Emergency Telephone Number

Company Telephone Number: (937) 886-9100

Emergency Telephone (24 hr): INFOTRAC (800) 535-5053 (North America)

+1-352-323-3500 (International)

2. Hazards Identification

Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least

15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs:

Get medical advice/attention.

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek

medical attention immediately.

Page 1 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Liquid

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give

anything by mouth to an unconscious person. Get medical attention if large

quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation.

Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the

system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media

Water spray (fog). Carbon dioxide (CO2). Dry chemical. Regular foam.

Unsuitable Extinguishing Media

Not determined

Specific Hazards Arising from the Chemical

Product is not flammable. Burning/combustion may produce oxides of carbon and nitrogen (NOx).

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or

groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area

with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices.

Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing

should be thoroughly washed before reuse.

Page 2 of 6

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry, and well-

ventilated area. Keep from freezing.

Incompatible Materials Acids.

8. Exposure Controls / Personal Protection

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection Goggles.

Skin & Body Protection Rubber gloves. Suitable protective clothing.

Respiratory Protection No protection is ordinarily required under normal conditions of use.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practices.

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

Physical State Liquid Odor None apparent
Appearance Yellow/green liquid Odor Threshold Not determined
Color Yellow/green

PropertyValuespH>8.0Melting/Freezing Point~32° FBoiling Point/Range~212° FFlash PointNot applicable

Evaporation Rate 1.8

Flammability (solid, gas)
Upper Flammability Limits
Lawar Flammability Limits
Not applicable

Lower Flammability LimitsNot applicableVapor PressureNot applicable

Vapor Density 0.6

Relative Density

Specific Gravity

Solubility

Partition Coefficient

Auto-ignition Temperature

Viscosity

U.5

Not applicable

Not determined

Highly soluble in water

Not determined

Not determined

Not determined

Not determined

Not determined

Page 3 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Liquid

10. Stability and Reactivity

Reactivity

Not reactive under normal conditions.

Chemical Stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials

Acids. Strong oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation Avoid breathing vapors or mists.

Ingestion Do not ingest.

Skin Contact May cause an allergic skin reaction.

None

Eye Contact Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure

May cause an allergic skin reaction.

Numerical Measures of Toxicity

Not determined

Symptoms Associated with Exposure

See Section 4 of this SDS for symptoms.

Carcinogenicity

OSHA

NTP None

IARC None

Page 4 of 6



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

12. Ecological Information

Ecotoxicity

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Not available

Persistence/Degradability

Not determined

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. Disposal Considerations

Waste Disposal Methods

Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

<u>Note</u>

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

OMDG Not regulated

15: Regulatory Information

International Inventories

TASCA This product is not subject to TSCA 12(b) reporting requirements.

U.S. Federal Regulations

CERCLA This material, as supplied, does not contain any substances regulated as

hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Page 5 of 6



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization

Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of

Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants

pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable

state right-to-know regulations.

16: Other Information

<u>HMIS</u>						
Health Hazards	Flammability	Instability	Special Hazards			
1	0	0	Not determined			

<u>NFPA</u>

Health Hazards	Flammability	Physical Hazards	Personal Protection
1	0	0	В

Revision Date 04-Oct-2013

Revision Date 06-Feb-2017

Revision Note Content Review

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Page 6 of 6



BRIGHT DYES FLT YELLOW/GREEN TABLET





Safety Data Sheet

Issue Date: 09-Nov-2013 Revision Date: 06-Feb-2017 Version Number: 2.1

1. Identification

Product Identifiers

Product Name: Bright Dyes® FLT Yellow/Green Tablet

Product Number: 101101

Recommended Use & Restrictions on Use

Water tracing & leak detection dye

Manufacturer/Supplier

Kingscote Chemicals, Inc. 3334 South Tech Blvd. Miamisburg, OH 45342

U.S.A.

Emergency Telephone Number

Company Telephone Number: (937) 886-9100

Emergency Telephone (24 hr): INFOTRAC (800) 535-5053 (North America)

+1-352-323-3500 (International)

2. Hazards Identification

Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least

15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs:

Get medical advice/attention.

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek

medical attention immediately.

Page 1 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Tablet

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give

anything by mouth to an unconscious person. Get medical attention if large

quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation.

Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the

system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media

Water spray (fog). Carbon dioxide (CO2). Dry chemical.

Unsuitable Extinguishing Media

Not determined

Specific Hazards Arising from the Chemical

Remote possibility of dust explosion. Burning may produce oxides of carbon and nitrogen (NOx).

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or

groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area

with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices.

Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing

should not be allowed out of the workplace.

Page 2 of 6



Bright Dyes® FLT Yellow/Green Tablet

Revision Date: 06-Feb-2017

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry, and well-

ventilated area. Store away from heat, sparks, open flame or any other

ignition source.

Incompatible Materials Bromine trifluoride. Lithium. Strong acids, bases, and oxidizing agents.

8. Exposure Controls / Personal Protection

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection Avoid contact with eyes.

Skin & Body Protection Rubber gloves. Suitable protective clothing.

Respiratory Protection Use NIOSH-approved dust mask if dusty conditions exist.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practices.

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

Physical StateSolidOdorNone apparentAppearanceOrange tabletOdor ThresholdNot determined

Color Orange

Values Property Not applicable рΗ **Melting/Freezing Point** Not applicable **Boiling Point/Range** Not applicable Flash Point Not applicable **Evaporation Rate** Not applicable Flammability (solid, gas) Not flammable **Upper Flammability Limits** Not applicable **Lower Flammability Limits** Not applicable Not applicable Vapor Pressure Vapor Density Not applicable **Relative Density** Not applicable **Specific Gravity** Not applicable

Solubility Highly soluble in water with small amounts of insoluble residue

Partition CoefficientNot determinedAuto-ignition TemperatureNot determinedDecomposition TemperatureNot determinedViscosityNot determined

Page 3 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Tablet

10. Stability and Reactivity

Reactivity

Not reactive under normal conditions.

Chemical Stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials

Bromine trifluoride. Lithium. Strong acids, bases, and oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation Avoid inhalation of dust.

Ingestion Do not ingest.

Skin Contact May cause an allergic skin reaction.

Eye Contact Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure

May cause an allergic skin reaction.

Numerical Measures of Toxicity

Not determined

Symptoms Associated with Exposure

See Section 4 of this SDS for symptoms.

Carcinogenicity

NTP None

IARC None

OSHA None

Page **4** of **6**

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Tablet

12. Ecological Information

121 Ecological Illion

Ecotoxicity

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Not available

Persistence/Degradability

This product is biodegradable.

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. Disposal Considerations

Waste Disposal Methods

Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

<u>Note</u>

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

OMDG Not regulated

15: Regulatory Information

International Inventories

Not determined

U.S. Federal Regulations

CERCLA This material, as supplied, does not contain any substances regulated as

hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Page **5** of **6**



Bright Dyes® FLT Yellow/Green Tablet

Revision Date: 06-Feb-2017

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization

Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of

Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants

pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable

state right-to-know regulations.

16: Other Information

HIVIIS					
Health Hazards	Flammability	Instability	Special Hazards		
1	0	0	Not determined		

<u>NFPA</u>

Health HazardsFlammabilityPhysical HazardsPersonal Protection100B

Revision Date 09-Nov-2013

Revision Date 06-Feb-2017

Revision Note Content Review

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Page 6 of 6



Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application Outfall 03A113 Fact Sheet

Los Alamos Neutron Science Center (LANSCE) Facility Operations (LFO)
TA-53-952 Cooling Tower





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Table of Contents

1.0	OUTFALL LOCATION [Section I]	5
2.0	FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]	5
2.1	Process Schematic and Water Balance [II.A]	5
2.2	Water Treatment Processes [II.B]	5
2.3	Discharge Rate and Frequency [II.C]	6
3.0	PRODUCTION [Section III]	6
4.0	IMPROVEMENTS [Section IV]	6
5.0	INTAKE AND EFFLUENT CHARACTERISTICS [Section V]	7
5.1	Analytical Data [V.A, B, and C]	7
5.2	Potential Pollutants [V.D]	7
6.0	POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]	7
7.0	BIOLOGICAL TOXICITY TESTING DATA [Section VII]	7
8.0	CONTRACT ANALYSIS INFORMATION [Section VIII]	8
ATTAC	CHMENT A: Location Map for Outfall 03A113	A-1
ATTAC	CHMENT B: Process Schematics and Water Balances	B-1
ATTAC	CHMENT C: Photographs	C-1
ATTAC	CHMENT D: Summary Discharge Monitoring Report October 2014 – September 2018	D-1
ΔΤΤΔ	CHMENT F. Safety Data Sheets	F-1

List of Tables

- 1 Sources for Discharges to Outfall 03A113
- Wastewater Treatment Codes Assigned to Outfall 03A113
- 3 List of Treatment Chemicals used in the Operations that Contribute to Outfall 03A113
- 4 Flow Rates and Frequencies for Discharges Outfall 03A113
- 5 Potential Future Flow Rates and Frequencies for Outfall 03A113
- 6 Potential Pollutants by Source for Outfall 03A113
- 7 List of Independent Laboratories Used for NPDES Water Analysis



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INDUSTRIAL AND SANITARY OUTFALLS 2019 NPDES PERMIT RE-APPLICATION OUTFALL 03A113 FACT SHEET

1.0 OUTFALL LOCATION [Section I]

Outfall ID No.:	03A113	Outfall Location:	Technical Area 53
Category:	03A, Treated Cooling Water	Originating Structure	TA-53-952 Cooling Tower and Water
	Discharges	for the Discharge:	Treatment System
Flow Type:	Intermittent	Receiving Stream:	Ephemeral Reach of Sandia Canyon
			Water Quality Segment 20.6.4.128 NMAC
Longitude:	106°15'43"W	Latitude:	35°52'03"N

2.0 FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]

Outfall 03A113 is located at TA-53 and discharges to a ephemeral reach of Sandia Canyon in Water Quality Segment 20.6.4.128 NMAC. The outfall discharges treated cooling water that originates at TA-3-950 and 952. Attachment A provides a location map. The cooling tower blow-down is comprised of potable water that is treated by the cooling tower water treatment system. Table 1 identifies the discharge source, the source location, and source composition.

	Table 1 Sources for Discharges to Outfall 03A113													
TA	TA Buildings a Transportation Mode Discharge Source Description Source Composition (Piping, Truck etc.)													
3	950, 952	Piping	TA-53-952 Cooling Tower	Treated Cooling Tower Blowdown Potable Water Used as Makeup Storm water										

a. The cooling tower is building TA-53-592 and the water treatment system for the cooling tower is located in the adjacent building TA-53-950.

2.1 Process Schematic and Water Balance [II.A]

A process schematic line drawing that shows the route taken by water from intake to the discharge at Outfall 03A113 is provided in Attachment B. This drawing includes all operations that contribute cooling water and storm water to the discharge at the Outfall 03A113. A water balance is also provided on the process schematic with average flows for the cooling tower intake and blowdown. The water balance is based upon actual data collected from cooling tower operations personnel and the flow meter/totalizer associated with the outfall.

2.2 Water Treatment Processes [II.B]

Outfall 03A113 receives cooling tower blowdown from the Low Energy Demonstration Accelerator (LEDA) Cooling Tower and associated water treatment system located at TA-53-952 and 950, respectively. The cooling tower provides cooling to the former LEDA beam line operations. The water treatment system includes an automatic chemical feed system that is controlled by a programmable logic controller (PLC). The PLC reacts to conductivity meters and a chlorine analyzer to add treatment chemicals, add makeup water, and/or blowdown the Tower. The treatment chemicals include bromicide, corrosion inhibitor, and a de-chlorination chemical. The bromicide and corrosion inhibitor are added to the cooling water along with makeup water prior to being circulated through the cooling Tower. The cooling loop includes a bag filter to reduce the amount of particulates that concentrates in the system as it is circulated through the loop and cooling tower. The dechlorination chemical is added to the blowdown line. Table 2 identifies the waste water treatment codes associated with the water treatment system. Attachment C provides photographs of the outfall, cooling Tower, and the wastewater treatment equipment.



	Table 2											
Wastewater Treatment Codes Assigned to Outfall 03A113												
Treatment Code	Treatment Code Description Justification											
2-H	Disinfection (other)	Chemicals are added to Control Microorganisms										
2-E	De-Chlorination	Chlorine Scavenger Chemicals are Added										
2-L	Reduction	Chemicals that are Corrosion Inhibitors are Added										

The water treatment processes identified in Table 2 utilize chemicals to control corrosion, limit biological growth, and dechlorinate blowdown prior to discharge. Table 3 provides a list of the chemicals used to treat the water in the cooling tower.

	Table 3 List of Treatment Chemicals used in the Operations that Contribute to Outfall 03A113													
Source	Chemical Name	Composition Identify Toxic Pollutan Hazardous Substances Table 2C-3	t and/or or 2C-4											
TA-53 952 Cooling	Bromicide Tablets	Biocide	bromo-chloro-5,5-dimethyl hydantoin (chlorine source)	2C-4										
Tower	WEST C-358	Corrosion Inhibitor	Sodium hydroxide	2C-4										
	WEST R-630	De-Chlorination	Sodium bisulfite	2C-4										
	Bright Dyes FLT Yellow/Green Liquid	Water Line & Drain Tracing Dye	NA	NA										
	Bright Dyes FLT Yellow/Green Tablet	Water Line & Drain Tracing Dye	NA	NA										

2.3 Discharge Rate and Frequency [II.C]

The discharge rates and frequencies for Outfall 03A113 are provided in Table 4.

Flow	Table 4 Flow Rates and Frequencies for Discharges to Outfall 03A113													
	Freque	ncy		Flow	Rates and V	olumes								
Source ^a	Days/Week Months		Average (MGD)	_		Maximum Volume (GPD)	Duration (days)							
TA-53-952 Cooling Tower	7.0	12.0	0.001576	0.01459	1,576	14,590	365							
Storm water	0.9	1.6	0.016763	0.13678	16,763	136,678	49 b							

a. Calculated between October 2017 and September 2018.

MGD = million gallons per day, GPD = gallons per day

3.0 PRODUCTION [Section III]

Section III is not applicable to Outfall 03A113.

4.0 IMPROVEMENTS [Section IV]

The cooling towers identified as TA-53-293 are not currently in use but could return to service in the future. These towers use an existing water treatment system that is identical to the one used for the TA-53-952 cooling towers (see Section 2.2). Table 5 provides an estimate for the future flow rates and frequencies of the outfall if the TA-53-952 cooling towers come back online. A Notice of Change will be submitted for the TA-53-293 cooling towers prior to return to service and subsequent increased volume to the outfall. Attachment B provides a proposed schematic and water balance for the future configuration.

b. Duration is the number of days that the outfall received a discharge between October 2017 and September 2018



Pote	ntial Future Flov		ble 5 d Frequenc	cies for Outfa	all 03A113						
Frequency Flow Rates and Volumes											
Source	Days/Week	Months	Average (MGD)	Maximum (MGD)	Average Volume (GPD)	Maximum Volume (GPD)	Duration (days)				
TA-53-952 Cooling Tower ^a	7.0	12.0	0.001576	0.01459	1,576	14,590	365				
Storm water	0.9	1.6	0.016763	0.1367	16,763	136,678	49 b				
TA-53-293 Cooling Towers ^c	7.0	12.0	0.0006	0.0016	557	1640	365				

- a. Calculated between October 2017 and September 2018.
- b. Duration is the number of days that the outfall received a discharge between October 2017 and September 2018.
- c. Frequency, flow rates, and volumes are estimated based upon historical data.

MGD = million gallons per day, GPD = gallons per day

5.0 INTAKE AND EFFLUENT CHARACTERISTICS [Section V]

5.1 Analytical Data [V.A, B, and C]

The analytical results provided for the Outfall 03A113 Permit Reapplication on the Form 2C were provided from the following sources:

- Samples collected on August 14, 2018 that were shipped to an independent laboratory for analysis.
- Field samples collected and analyzed on August 14, 2018 for temperature, residual chlorine, and pH.
- Field samples collected and analyzed on February 13, 2019 for sulfite.
- Discharge Monitoring Report Summary for Outfall 03A113 from October 2014 to September 2018 (Attachment D).
- Calculated Hardness = 96 mg/L (CaCO₃)

5.2 Potential Pollutants [V.D]

The treatment chemicals associated with the cooling tower water treatment system and the potable water used for makeup water to the tower constitute the pollutant load of the discharge to Outfall 03A113. Table 6 identifies the Table 2C-3 and 2C-4 pollutants by discharge source. It also identifies those pollutants (if any) that were detected in the analytical results from the samples collected for the 2019 Permit Renewal Application.

Table 6 Potential Pollutants by Source for Outfall 03A113												
Source POTENTIAL Analytical Data												
	Toxic Pollutant and	or Hazardous	Results									
	Substances Table	2C-3 or 2C-4										
TA-53- 952 Cooling Tower	Sodium Hydroxide	2C-4	pH = 6.7 - 8.7 S.U.									
	Sodium Bisulfite	2C-4	Sulfite 74.7 mg/L ^a									
	Chlorine	2C-4	Total Residual Chlorine = 0									
Potable Water Used as Makeup	Chlorine	2C-4	Total Residual Chlorine = 0									
a. Sulfite result may be artificially high because	it was collected at a time of	year when the coo	ling load on the towers was low.									

The safety data sheets associated with the chemicals used in the cooling tower are provided in Attachment E.

6.0 POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]

Section VI is not applicable to Outfall 03A113.

7.0 BIOLOGICAL TOXICITY TESTING DATA [Section VII]

Section VII is not applicable to Outfall 03A113.



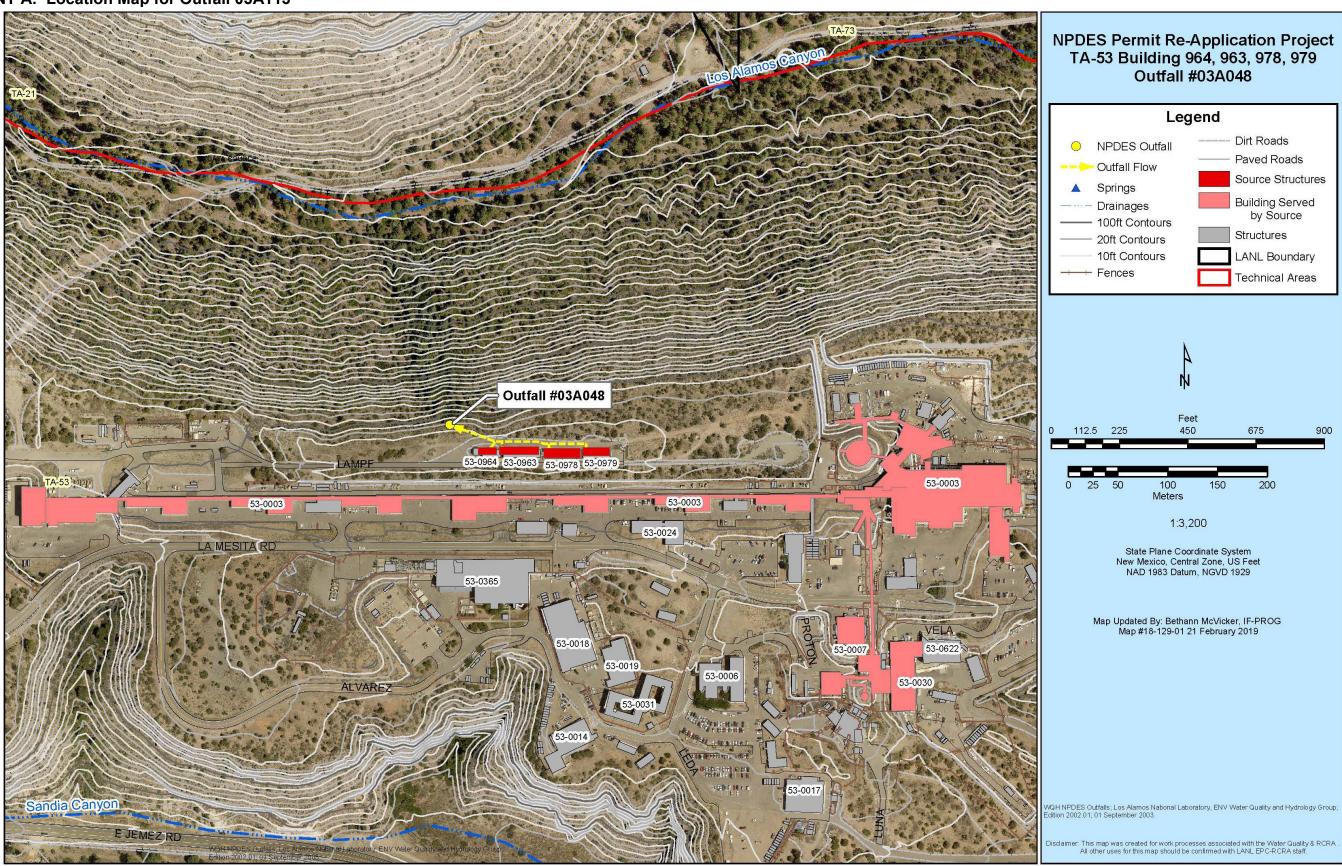
8.0 CONTRACT ANALYSIS INFORMATION [Section VIII]

Samples were collected from the cooling tower blowdown on August 14, 2018 for the Form 2C constituents required by the permit application forms. These samples were submitted to independent laboratories as summarized in Table 7.

L	Table 7 List of Independent Laboratories Used for NPDES Water Analysis												
Laboratory Name	Address and Contact Info	Analytes											
GEL Laboratories LLC	2040 Savage Road	Biological Oxygen Demand, General Chemistry,											
	Charleston SC 29407	Pesticides, Polychlorinated Biphenyls, Radiochemistry,											
	(843) 556-8171	Semi-volatile Organic Compounds, Total Metals, Total											
	,	Suspended Solids, Volatile Organic Compounds											
New Mexico Water	401 North Coronado Ave	E.coli											
Testing Laboratory, Inc.	Espanola, NM 87532												
	(505) 929-4545												
Cape Fear Analytical	3306 Kitty Hawk Road Suite 120	TCDD (Dioxin)											
LLC	Wilmington, NC 28405												
	(910) 795-0421												



ATTACHMENT A: Location Map for Outfall 03A113



GENERAL NOTES AND LEGEND:

Dashed line indicates equipment located the building adjacent to the cooling towers. Flow rates were calculated using data

PROCESS SCHEMATIC & WATER BALANCE FOR OUTFALL 03A113 February 13. 2019

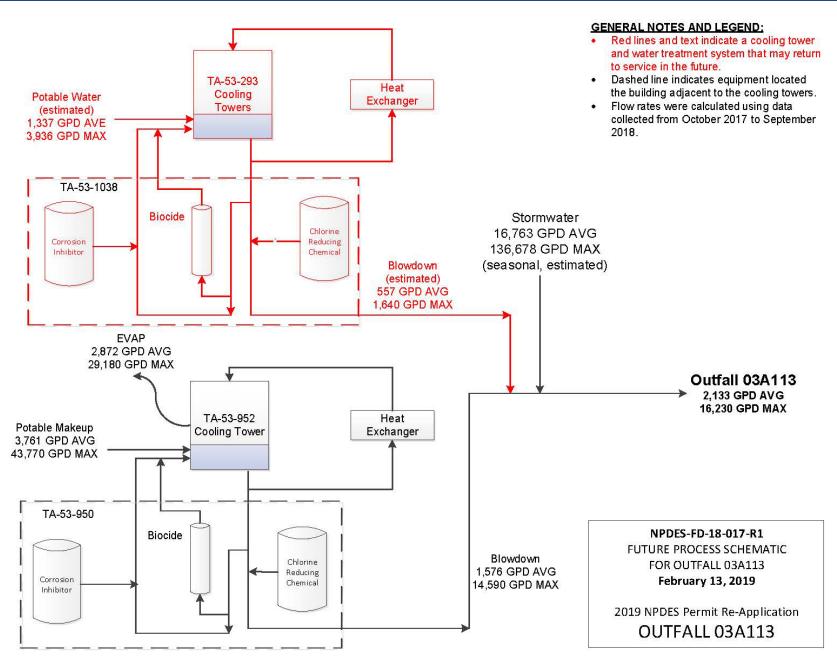
2019 NPDES Permit Re-Application
OUTFALL 03A113



ATTACHMENT B: Process Schematics and Water Balances

collected from October 2017 to September **EVAPORATION** 2.872 GPD AVG 29,180 GPD MAX TA-53-952 Potable Water Cooling Tower (Makeup) 3.761 GPD AVG Heat 43,770 GPD MAX Exchanger Stormwater TA-53-950 16,763 GPD AVG 136,678 GPD MAX Biocide (seasonal, estimated) Chlorine Reducing Corrosion Chemical Inhibitor Outfall 03A113 1.576 GPD AVG Blowdown 14,590 GPD MAX 1,576 GPD AVG 14,590 GPD MAX NPDES-FD-18-009-R1







ATTACHMENT C: Photographs

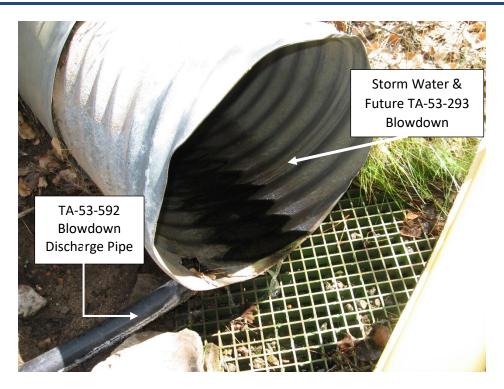
Photograph ID No.	Photograph Title
NPDES-03A113-18-001	Outfall 03A113 Location
NPDES-03A113-18-002	Outfall 03A113 Condition at Discharge Location
NPDES-03A113-18-003	Outfall 03A113 Accessibility
NPDES-03A113-18-004	Outfall 03A113 Receiving Stream Ephemeral Tributary to Sandia Canyon, Water Quality Segment Number 20.6.4.126 NMAC
NPDES-03A113-18-005	TA-53-952 Cooling Tower
NPDES-03A113-18-006	TA-53-952 Brominator
NPDES-03A113-18-007	TA-53-952 Chemical Treatment Feed Tanks
NPDES-03A113-18-008	TA-53-293 Cooling Towers [Inactive but Available for Use]
NPDES-03A113-18-009	TA-53-293 Brominator [Inactive but Available for Use]
NPDES-03A113-18-010	TA-53-293 Chemical Treatment Feed Tanks [Inactive but Available for Use]



Photograph - NPDES-03A113-18-001 **Outfall 03A113 Location**

LA-UR-19-22215 **Attachment C** C-1 of 6





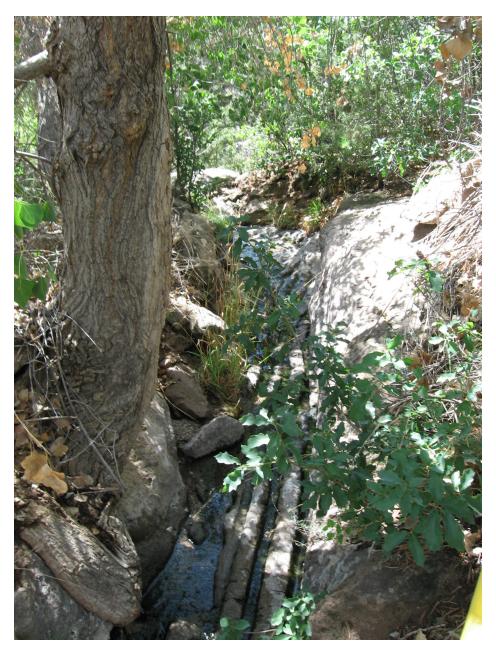
Photograph - NPDES-03A113-18-002
Outfall 03A113 Condition at Discharge Location



Photograph - NPDES-03A113-18-003 Outfall 03A113 Accessibility

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



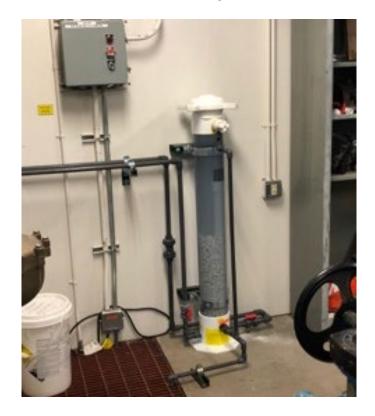


Photograph - NPDES-03A113-18-004
Outfall 03A113 Receiving Stream Ephemeral Tributary to
Sandia Canyon, Water Quality Segment Number 20.6.4.126 NMAC





Photograph - NPDES-03A113-18-005 TA-53-952 Cooling Tower



Photograph - NPDES-03A113-18-006 TA-53-952 Cooling Tower Brominator Located in TA-53-950

LA-UR-19-22215 Attachment C





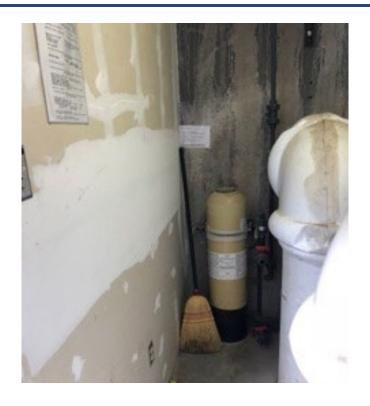
Photograph - NPDES-03A113-18-007
TA-53-952 Cooling Tower Chemical Treatment Feed Tanks Located in TA-53-950



Photograph - NPDES-03A113-18-008
TA-53-293 Cooling Towers [Inactive but Available for Use]

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application





Photograph - NPDES-03A113-18-009 TA-53-293 Brominator Located in TA-53-1038 [Inactive but Available for Use]



Photograph - NPDES-03A113-18-010 TA-53-293 Chemical Treatment Feed Tanks Located in TA-53-1038 [Inactive but Available for Use]

LA-UR-19-22215 **Attachment C** C-6 of 6



ATTACHMENT D: Summary Discharge Monitoring Report October 2014 – September 2018

					Quantity o	r Loading		Quality or C								
OUTFALL			Monitoring		, , , , ,									Number of		
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency	Notes
03A113	TA-53-950, 952, 293	2014	Oct	Flow (Totalized Est.)	0.000533	0.002000	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2014	Nov	Flow (Totalized Est.)	0.000663	0.002080	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2014	Dec	Flow (Totalized Est.)	0.000541	0.003500	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	Jan	Flow (Totalized Est.)	0.000940	0.010190	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	Feb	Flow (Totalized Est.)	0.001001	0.003770	MGD							28	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	Mar	Flow (Totalized Est.)	0.000519	0.001640	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	Apr	Flow (Totalized Est.)	0.000829	0.002410	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	May	Flow (Totalized Est.)	0.002479	0.006400	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	Jun	Flow (Totalized Est.)	0.001508	0.006490	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	Jul	Flow (Totalized Est.)	0.001134	0.004680	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	Aug	Flow (Totalized Est.)	0.001375	0.004800	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	Sept	Flow (Totalized Est.)	0.002362	0.021210	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	Oct	Flow (Totalized Est.)	0.000615	0.002450	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	Nov	Flow (Totalized Est.)	0.000429	0.001350	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2015	Dec	Flow (Totalized Est.)	0.000204	0.000650	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	Jan	Flow (Totalized Est.)	0.000964	0.005090	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	Feb	Flow (Totalized Est.)	0.001027	0.002010	MGD							29	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	Mar	Flow (Totalized Est.)	0.000432	0.001110	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	Apr	Flow (Totalized Est.)	0.001253	0.010570	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	May	Flow (Totalized Est.)	0.000386	0.000780	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	Jun	Flow (Totalized Est.)	0.000825	0.001620	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	Jul	Flow (Totalized Est.)	****	***	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	Aug	Flow (Totalized Est.)	****	***	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	Sept	Flow (Totalized Est.)	0.002688	0.020790	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	Oct	Flow (Totalized Est.)	0.000445	0.001420	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	Nov	Flow (Totalized Est.)	0.000729	0.008260	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2016	Dec	Flow (Totalized Est.)	0.001016	0.002630	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2017	Jan	Flow (Totalized Est.)	0.000493	0.001280	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2017	Feb	Flow (Totalized Est.)	0.001171	0.005600	MGD							28	Daily	Permit Required
03A113	TA-53-950, 952, 293	2017	Mar	Flow (Totalized Est.)	0.003053	0.013310	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2017	Apr	Flow (Totalized Est.)	0.006244	0.032850	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2017	May	Flow (Totalized Est.)	0.001183	0.003170	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2017	Jun	Flow (Totalized Est.)	0.001802	0.003800	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2017	Jul	Flow (Totalized Est.)	0.001234	0.002180	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2017	Aug	Flow (Totalized Est.)	0.000957	0.002750	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2017	Sept	Flow (Totalized Est.)	0.001983	0.003850	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2017	Oct	Flow (Totalized Est.)	0.000453	0.001380	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2017	Nov	Flow (Totalized Est.)	0.000729	0.008260	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2017	Dec	Flow (Totalized Est.)	0.000664	0.006530	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2018	Jan	Flow (Totalized Est.)	0.000254	0.001750	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2018	Feb	Flow (Totalized Est.)	0.000445	0.001060	MGD							28	Daily	Permit Required
03A113	TA-53-950, 952, 293	2018	Mar	Flow (Totalized Est.)	0.000769	0.002290	MGD							31	Daily	Permit Required



					Quantity o	r Loading		Quality or C	Concentration							
OUTFALL			Monitoring					2						Number of		
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency	Notes
03A113	TA-53-950, 952, 293	2018	Apr	Flow (Totalized Est.)	0.001786	0.006280	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2018	May	Flow (Totalized Est.)	0.003529	0.014590	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2018	Jun	Flow (Totalized Est.)	0.002411	0.011370	MGD							30	Daily	Permit Required
03A113	TA-53-950, 952, 293	2018	Jul	Flow (Totalized Est.)	0.003297	0.013190	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2018	Aug	Flow (Totalized Est.)	0.003496	0.011120	MGD							31	Daily	Permit Required
03A113	TA-53-950, 952, 293	2018		Flow (Totalized Est.)	0.000205	0.000760	MGD							30	Daily	Permit Required
			·	Flow (Totalized Est.)	Max	imum 30 Day	/ Average		0.0062				mg/L	1,461	·	·
	Flow (Totalized Es						/Jaximum			0.0329			mg/L	1,461		
03A113	TA-53-950, 952, 293	2014	Oct	pH				7.9	***	8.6	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2014	Nov	pH				7.6	****	8.7	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2014	Dec	pH				7.5	***	8.4	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Jan	pH				7.7	****	8.1	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Feb	рН				7.6	****	8.4	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Mar	рН				7.8	****	8.4	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Apr	рН				8.3	****	8.7	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	May	рН				8.1	****	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Jun	рН				7.3	****	7.9	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Jul	рН				7.5	****	8.5	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Aug	рН				7.6	****	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Sept	рН				7.3	****	8.3	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Oct	рН				7.3	****	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Nov	рН				6.9	****	7.3	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Dec	рН				7.1	****	7.5	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2016	Jan	рН				7.2	****	7.9	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2016	Feb	рН				6.8	****	8.7	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2016	Mar	рН				7.2	****	7.3	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2016	Apr	рН				7.1	****	7.2	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2016	May	рН				7.0	***	7.3	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			рН				7.1	****	7.4	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			рН				****	****	****	S.U.	6.0 - 9.0	S.U.	0.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			рН				****	****	****	S.U.	6.0 - 9.0	S.U.	0.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293		•	рН				6.9	****	7.2	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			рН				6.9	****	7.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			рН				7.4	****	8.0	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2016	Dec	рН				7.4	****	7.7	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			рН				7.2	****	7.4	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			рН				7.2	****	8.2	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			рН				7.1	****	8.0	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Apr	рН				7.2	****	7.3	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	May	рН				7.3	****	7.5	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			рН				7.3	****	7.7	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			рН				7.3	****	8.2	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			рН				7.4	****	8.3	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Sept	рН				7.4	***	8.2	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required



					Quantity of	r Loading		Quality or C	Concentration							
OUTFALL			Monitoring		-			-						Number of		
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency	Notes
03A113	TA-53-950, 952, 293	2017	Oct	рН				7.2	***	7.5	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Nov	рН				7.0	***	8.0	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Dec	рН				6.8	***	7.5	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Jan	рН				7.1	****	7.3	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Feb	рН				7.2	****	7.3	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Mar	рН				7.1	****	7.5	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Apr	рН				7.0	****	7.2	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	May	рН				7.0	****	7.2	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Jun	рН				6.7	***	7.0	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Jul	рН				7.0	****	8.0	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Aug	рН				6.8	****	7.1	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Sept	рН				6.8	****	7.2	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Permit Required
				рН		l	Minimum	6.7						201		
				рН	Max	kimum 30 Day	y Average		8.54					201		
				рН			Maximum			8.7				201		
03A113	TA-53-950, 952, 293	2014	Oct	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2014	Nov	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2014	Dec	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Jan	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Feb	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Mar	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Apr	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	May	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Jun	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Jul	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Aug	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Sept	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293		Oct	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Nov	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2015	Dec	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	1		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293		•	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293		-	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			Total Residual Chlorine				****	****	****	mg/L	0.011	mg/L	0.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			Total Residual Chlorine				****	****	****	mg/L	0.011	mg/L	0.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293		•	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2016	Dec	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Feb	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required



					Quantity of	r Loading		Quality or C	Concentration							
OUTFALL			Monitoring		,			, ,						Number of		
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency	Notes
03A113	TA-53-950, 952, 293	2017	Mar	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Apr	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	May	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Jun	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Jul	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Aug	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Sept	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Oct	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Nov	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2017	Dec	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Jan	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Feb	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Mar	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Apr	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	May	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Jun	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Jul	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Aug	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Permit Required
03A113	TA-53-950, 952, 293	2018	Sept	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Permit Required
				Total Residual Chlorine		Daily	Average							201		
				Total Residual Chlorine	Max	imum 30 Day	Average		0					201		
				Total Residual Chlorine		N	/laximum			0				201		
03A113	TA-53-950, 952, 293	2014	Dec	Phosphorus				****	0.142	0.142	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2015	Mar	Phosphorus				****	0.0949	0.0949	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2015	Jun	Phosphorus				****	0.155	0.155	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2015	Sept	Phosphorus				****	0.0729	0.0729	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293			Phosphorus				****	<0.056	<0.056	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293			Phosphorus				****	0.0939	0.0939	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293			Phosphorus				****	0.0722	0.0722	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293		•	Phosphorus				****	0.302	0.302	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293			Phosphorus				****	0.147	0.147	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293			Phosphorus				****	0.074	0.074	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293			Phosphorus				****	0.0952	0.0952	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
03A113			•	Phosphorus				****	0.0948	0.0948	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293			Phosphorus				****	0.144	0.144	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293			Phosphorus				****	0.103	0.103	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293			Phosphorus				****	0.144	0.144	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2018	Sept	Phosphorus				****	0.0982	0.0982	mg/L	20 - 40	mg/L	1	Quarterly	Permit Required
				Phosphorus		•	Average		0.1					16		
				Phosphorus	Max	imum 30 Day			0.302	_				16		
				Phosphorus		N	/laximum			0.302				16		
03A113	TA-53-950, 952, 293			Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293			Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2015	Jun	Total Suspended Solids				****	1	1	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required



					Quantity o	r Loading		Quality or C	oncentration							
OUTFALL			Monitoring		•									Number of		
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency	Notes
03A113	TA-53-950, 952, 293	2015	Sept	Total Suspended Solids				****	1	1	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2015	Dec	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2016	Mar	Total Suspended Solids				****	0.7	0.7	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2016	Jun	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2016	Sept	Total Suspended Solids				****	<0.582	<0.582	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2016	Dec	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2017	Mar	Total Suspended Solids				****	5.68	5.68	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2017	Jun	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2017	Sept	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2017	Dec	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2018	Mar	Total Suspended Solids				****	0.6	0.6	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2018	Jun	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
03A113	TA-53-950, 952, 293	2018	Sept	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Permit Required
				Total Suspended Solids		Daily	/ Average		1.8					16		
				Total Suspended Solids	Max	imum 30 Day	/ Average		5.68					16		
				Total Suspended Solids		N	/laximum			5.68				16		
03A113	TA-53-950, 952, 293	2015	Sept	Copper, Dissolved				****	****	0.00315	mg/L		mg/L	1	Yearly	Permit Required
03A113	TA-53-950, 952, 293	2016	Sept	Copper, Dissolved				****	****	0.00728	mg/L	NA	mg/L	1	Yearly	Permit Required
03A113	TA-53-950, 952, 293	2017	Sept	Copper, Dissolved				****	****	0.00395	mg/L		mg/L	1	Yearly	Permit Required
03A113	TA-53-950, 952, 293	2018	Sept	Copper, Dissolved				****	****	0.00489	mg/L		mg/L	1	Yearly	Permit Required
				Copper		Daily	/ Average		0.0048					4		
				Copper	Max	imum 30 Day	/ Average		0.00728					4		
				Copper		N	/laximum			0.00728				4		
03A113	TA-53-950, 952, 293	2015	Sept	Aluminum, Total				****	****	<0.015	mg/L		mg/L	1	Yearly	Permit Required
03A113	TA-53-950, 952, 293	2016	Sept	Aluminum, Total				****	****	<0.015	mg/L	NA	mg/L	1	Yearly	Permit Required
03A113	TA-53-950, 952, 293	2017	Sept	Aluminum, Total				****	****	<0.0193	mg/L		mg/L	1	Yearly	Permit Required
03A113	TA-53-950, 952, 293	2018	Sept	Aluminum, Total				****	****	<0.0193	mg/L		mg/L	1	Yearly	Permit Required
				Aluminum			/ Average							4		
				Aluminum	Max	imum 30 Day	/ Average		0					4		
				Aluminum		N	/laximum			0				4		
03A113	TA-53-950, 952, 293	2016	Sept	Adjusted Gross Alpha				****	0	0	pCi/L	NA	mg/L	1	Term	Permit Required
				Mercury, Total			/ Average							1		
				Mercury, Total	Max	timum 30 Day								1		
				Mercury, Total		N	/laximum			0				1		



ATTACHMENT E: Safety Data Sheets

LIST OF SAFETY DATA SHEETS								
Bromocide Tablets								
WEST C-358								
WEST R-630								
Bright Dyes FLT Yellow/Green Liquid								
Bright Dyes FLT Yellow/Green Tablet								



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BROMICIDE TABLETS

Revision date: 3/28/2016

Revision: 9



SAFETY DATA SHEET **BROMICIDE TABLETS**

1. Identification

Product identifier

Product name **BROMICIDE TABLETS**

Chemical name Bromo-chloro-5,5-dimethylhydantoin

Product number 100405, 100406, 100407, 100412, 100414, 100794, 101187

CAS number 32718-18-6

Recommended use of the chemical and restrictions on use

Application Biocides for water treatment.

Details of the supplier of the safety data sheet

BWA Water Additives US LLC Supplier

1979 Lakeside Parkway Suite 925, Tucker, GA30084

USA

T: +1 800 600 4523 T: +1 678 802 3050

E: msds@wateradditives.com

Emergency telephone number

CHEMTREC Phone: 1-800-424-9300 **Emergency telephone**

2. Hazard(s) identification

Classification of the substance or mixture

Physical hazards Ox. Sol. 3 - H272

Health hazards Acute Tox. 4 - H302 Skin Corr. 1C - H314 Eye Dam. 1 - H318 Skin Sens. 1 - H317

Environmental hazards Aquatic Acute 1 - H400

Label elements

Pictogram









Signal word

Danger

Hazard statements H272 May intensify fire; oxidizer.

H302 Harmful if swallowed.

H314 Causes severe skin burns and eye damage.

H317 May cause an allergic skin reaction.

H400 Very toxic to aquatic life.



Revision date: 3/28/2016 Revision: 9

BROMICIDE TABLETS

Precautionary statements P210 Keep away from heat, sparks, open flames and hot surfaces. No smoking.

P220 Keep away from combustible materials.

P221 Take any precaution to avoid mixing with combustibles.

P260 Do not breathe vapor/ spray. P261 Avoid breathing vapor/ spray.

P264 Wash contaminated skin thoroughly after handling. P270 Do not eat, drink or smoke when using this product.

P272 Contaminated work clothing must not be allowed out of the workplace.

P273 Avoid release to the environment.

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

P301+P310 If swallowed: Immediately call a poison center/ doctor. P301+P330+P331 If swallowed: Rinse mouth. Do NOT induce vomiting.

P302+P352 If on skin: Wash with plenty of water.

P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.

P304+P340 If inhaled: Remove person to fresh air and keep comfortable for breathing.

P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact

lenses, if present and easy to do. Continue rinsing.

P321 Specific treatment (see medical advice on this label).

P333+P313 If skin irritation or rash occurs: Get medical advice/ attention. P362+P364 Take off contaminated clothing and wash it before reuse.

P363 Wash contaminated clothing before reuse.

P370+P378 In case of fire: Use foam, carbon dioxide, dry powder or water fog to extinguish.

P391 Collect spillage. P405 Store locked up.

P501 Dispose of contents/ container in accordance with national regulations.

Contains Bromo-chloro-5,5-dimethylhydantoin

3. Composition/information on ingredients

Mixtures

Bromo-chloro-5,5-dimethylhydantoin

96.0%

CAS number: 32718-18-6 M factor (Acute) = 1

Classification

Ox. Sol. 3 - H272 Acute Tox. 4 - H302 Skin Corr. 1C - H314 Eye Dam. 1 - H318 Skin Sens. 1 - H317 Aquatic Acute 1 - H400

Inert ingredients

4.0%

CAS number: -

Classification

Not Classified

The Full Text for all Hazard Statements are Displayed in Section 16.

Composition comments

1-bromo-3-chloro-5,5-dimethylhydantoin



Revision date: 3/28/2016 Revision: 9

BROMICIDE TABLETS

4. First-aid measures

Description of first aid measures

Move affected person to fresh air and keep warm and at rest in a position comfortable for Inhalation

breathing. Get medical attention. Show this Safety Data Sheet to the medical personnel.

Ingestion Do not induce vomiting. Give plenty of water to drink. Rinse mouth thoroughly with water.

Never give anything by mouth to an unconscious person. Get medical attention. Show this

Safety Data Sheet to the medical personnel.

Skin Contact Remove contaminated clothing. Rinse immediately with plenty of water. Continue to rinse for

at least 15 minutes. Get medical attention. Show this Safety Data Sheet to the medical

personnel.

Eve contact Rinse immediately with plenty of water. Remove any contact lenses and open eyelids wide

apart. Continue to rinse for at least 15 minutes. Get medical attention. Show this Safety Data

Sheet to the medical personnel.

Most important symptoms and effects, both acute and delayed

Dust may irritate the respiratory system. Inhalation

Ingestion May cause stomach pain or vomiting. May cause chemical burns in mouth and throat. Due to

the physical nature of this material it is unlikely that swallowing will occur.

Skin contact Chemical burns. Burning pain and severe corrosive skin damage.

Eye contact Severe irritation, burning and tearing

Indication of immediate medical attention and special treatment needed

If lavage is performed suggest endotracheal and/or esophageal control.Danger from lung Notes for the doctor

> aspiration must be weighed against toxicity when considering emptying the stomach. The decision of whether to induce vomiting or not should be made by a physician. Chemical eye burns may require extended irrigation. Obtain prompt consultation preferably from an opthalmologist.lf burn is present, treat as any thermal burn, after decontamination. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical

condition of the patient.

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media Extinguish with the following media: Water spray, fog or mist. Alcohol-resistant foam.

Unsuitable extinguishing

media

Carbon dioxide (CO2). Dry chemicals.

Special hazards arising from the substance or mixture

Specific hazards Toxic gases/vapors/fumes of: Bromine. Chlorine. Oxides of the following substances: Carbon.

Nitrogen. Thermal decomposition or combustion products may include the following

substances: Toxic gases or vapors.

Advice for firefighters

Protective actions during

firefighting

Move containers from fire area if it can be done without risk. Control run-off water by

containing and keeping it out of sewers and watercourses.

for firefighters

Special protective equipment Leave danger zone immediately. Wear positive-pressure self-contained breathing apparatus

(SCBA) and appropriate protective clothing.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures



Revision date: 3/28/2016

BROMICIDE TABLETS

Revision: 9

Personal precautions Follow precautions for safe handling described in this safety data sheet. For personal

protection, see Section 8.

Environmental precautions

Environmental precautions Avoid release to the environment. To prevent release, place container with damaged side up.

Methods and material for containment and cleaning up

Methods for cleaning up Provide adequate ventilation. Contain spillage with sand, earth or other suitable non-

combustible material. Avoid the spillage or runoff entering drains, sewers or watercourses. Collect spillage for reclamation or disposal in sealed containers via a licensed waste contractor. Containers with collected spillage must be properly labeled with correct contents and hazard symbol. Wash thoroughly after dealing with a spillage. Avoid generation and

spreading of dust. Avoid contact with water.

Reference to other sections For personal protection, see Section 8. For waste disposal, see section 13.

7. Handling and storage

Precautions for safe handling

Usage precautions Provide adequate ventilation. Avoid inhalation of vapors. Use approved respirator if air

contamination is above an acceptable level. Do not use in confined spaces without adequate ventilation and/or respirator. Avoid spilling. Avoid contact with skin and eyes. Avoid contact with the following materials: Acids. Moisture. Avoid handling which leads to dust formation.

Conditions for safe storage, including any incompatibilities

Storage precautions Store in tightly-closed, original container in a dry, cool and well-ventilated place. Keep

container tightly closed. Protect from light. Keep away from heat, sparks and open flame.

Store away from the following materials: Reducing agents.

Storage class Oxidizer storage.

Specific end uses(s)

Specific end use(s) The identified uses for this product are detailed in Section 1.2.

8. Exposure Controls/personal protection

Ingredient comments No exposure limits known for ingredient(s)

Exposure controls

Protective equipment





Appropriate engineering controls All handling should only take place in well-ventilated areas.

Eye/face protection The following protection should be worn: Chemical splash goggles or face shield.

Hand protection Selection of a suitable glove depends on work conditions and whether the product is present

4/9

on its own or in combination with other substances. Wear protective gloves made of the following material: Butyl rubber. Neoprene. Nitrile rubber. Polyethylene. Polyvinyl chloride (PVC). Gloves should be replaced immediately if signs of degradation are observed.

Other skin and body protection Wear appropriate clothing to prevent any possibility of skin contact. Wear a suitable dust mask. Wear apron or protective clothing in case of contact.



Revision date: 3/28/2016 Revision: 9

BROMICIDE TABLETS

Hygiene measures Use engineering controls to reduce air contamination to permissible exposure level. Provide

eyewash station. No specific hygiene procedures recommended but good personal hygiene practices should always be observed when working with chemical products. Contaminated

clothing should be placed in a closed container for disposal or decontamination.

Respiratory protection Wear a suitable dust mask.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Appearance Tablet.

Color White/off-white. Odor Slight. Halogen

Odor threshold Not available. Not available.

pH (diluted solution): 3.5 @ 0.15 % pΗ

Melting point 156 - 162°C Initial boiling point and range Not known.

Freezing Point

Flash point Not applicable. Evaporation rate Not known. Evaporation factor Not applicable.

Upper/lower flammability or

explosive limits

Not available.

Vapor pressure 0.0038 Pa @ °C Vapor density Not available. Relative density Not applicable.

Bulk density 0.9 kg/l

Solubility(ies) 0.15 @ °C Slightly soluble in water.

log Pow: 0.35 Partition coefficient Auto-ignition temperature Not available. Viscosity Not known.

Explosive properties There are no chemical groups present in the product that are associated with explosive

properties.

Oxidizing properties The product contains a substance classified as oxidizing. Keep away from flammable and

combustible materials.

Molecular weight 241.47

Molecular Formula C5 H6 Br Cl N2 O2

10. Stability and reactivity

Reactivity This material has oxidising properties.

Stability Stable at normal ambient temperatures. Avoid the following conditions: Moisture.



Revision date: 3/28/2016

BROMICIDE TABLETS

Revision: 9

Possibility of hazardous

reactions

Will not polymerize

Conditions to avoid Generates toxic gas in contact with acid. Avoid excessive heat for prolonged periods of time.

Avoid heat, flames and other sources of ignition.

Materials to avoid Strong acids. Strong reducing agents. Strong alkalis.

Hazardous decomposition Toxic gases/vapors/fumes of: Hydrogen bromide (HBr). Bromine. Hydrogen chloride (HCl).

products Chlorine. Oxides of the following substances: Carbon. Nitrogen.

11. Toxicological information

Information on toxicological effects

Toxicological effects Ames Test negative

Other health effects There is no evidence that the product can cause cancer.

Supplemental Toxicological

Information

Acute toxicity - oral

Acute toxicity oral (LD∞

mg/kg)

578.0

Species Rat
ATE oral (mg/kg) 520.83

Acute toxicity - dermal

Acute toxicity dermal (LD60

mg/kg)

2,000.0

Species Rabbit

Germ cell mutagenicity

Genotoxicity - in vitro Ames test: Negative.

Inhalation May cause respiratory system irritation.

Ingestion Harmful if swallowed.

Skin Contact Causes burns. May cause sensitisation by skin contact.

Eye contact Causes burns.

Acute and chronic health

hazards

Causes severe burns. May cause sensitisation by skin contact.

Route of entry Skin and/or eye contact Ingestion.

12. Ecological Information

Ecotoxicity The product contains a substance which is very toxic to aquatic organisms.

Toxicity

Acute toxicity - fish LC50, 96 hours: 0.87 mg/l, Onchorhynchus mykiss (Rainbow trout)

LC50, 96 hours: 0.87 mg/l, Fish



Revision date: 3/28/2016 Revision: 9

BROMICIDE TABLETS

Acute toxicity - aquatic

invertebrates

EC₅₀, 48 hours: 0.46 mg/l, Daphnia magna EC₅₀, 48 hours: 0.46 mg/l, Daphnia magna

Persistence and degradability

Persistence and degradability Ha

Halogens will dissociate in water leaving DMH. DMH is readily biodegradable in a CO2 Evolution study and passes the 10-day window criteria. DMH has also been shown to be

rapidly degraded in a water/sediment system.

Chemical oxygen demand 1

1.005 g O₂/g substance

Bioaccumulative potential

Bio-Accumulative Potential Low bioaccumulation potential

Partition coefficient log Pow: 0.35

Mobility in soil

Mobility No information available.

Results of PBT and vPvB assessment

Results of PBT and vPvB

This substance is not classified as PBT or vPvB according to current EU criteria.

assessment

Other adverse effects

Acute Toxicity. Lc50 96 Hours, >640 American Oyster

Mg/L

13. Disposal considerations

Waste treatment methods

General information When handling waste, the safety precautions applying to handling of the product should be

considered

Disposal methods Dispose of waste to licensed waste disposal site in accordance with the requirements of the

local Waste Disposal Authority. Absorb in vermiculite, dry sand or earth and place into containers. Dispose of waste via a licensed waste disposal contractor. Liquid material should be incinerated. Material absorbed onto sand or earth should be disposed of as solid waste in accordance with local regulations. Empty packaging may contain product residues and due

consideration should be given prior to disposal.

Waste class 07 01 99

14. Transport information

UN Number

UN No. (TDG) 3085
UN No. (IMDG) 3085
UN No. (ICAO) 3085
UN No. (DOT) 3085

UN proper shipping name

Proper shipping name (TDG) OXIDISING SOLID, CORROSIVE, N.O.S., (contains bromo-chloro-dimethylhydantoin) 5.1(8),

PGIII, MARINE POLLUTANT

Proper shipping name (IMDG) OXIDISING SOLID, CORROSIVE, N.O.S., (contains bromo-chloro-dimethylhydantoin) 5.1(8),

PGIII, MARINE POLLUTANT



Revision date: 3/28/2016

Revision: 9

BROMICIDE TABLETS

Proper shipping name (ICAO) OXIDISING SOLID, CORROSIVE, N.O.S., (contains bromo-chloro-dimethylhydantoin) 5.1(8),

PGIII, MARINE POLLUTANT

Proper shipping name (DOT) OXIDISING SOLID, CORROSIVE, N.O.S., (contains bromo-chloro-dimethylhydantoin) 5.1(8),

PGIII, MARINE POLLUTANT

Transport hazard class(es)

TDG class 5.1+8 TDG label(s) 5.1+8 **IMDG Class** 5.1+8 ICAO class/division 5.1 ICAO subsidiary risk

Transport labels





Packing group

TDG Packing Group 111 IMDG packing group 111 ICAO packing group Ш DOT packing group Ш

Environmental hazards

Environmentally Hazardous Substance



Special precautions for user

EmS F-A, S-Q

Annex II of MARPOL 73/78

Transport in bulk according to Not applicable.

and the IBC Code

Classification Code (Adr) OC2

15. Regulatory information

Regulatory Status This chemical is a pesticide product registered by the Environmental Protection Agency and is

subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label: DANGER Avoid contact with eyes, skin and clothing. EPA Reg. No.

Regulatory References 29 CFR 1910.1010 Federal Regulations (OSHA Standard)

Canadian Regulatory Status PMRA PCP No. 31855



Revision date: 3/28/2016

BROMICIDE TABLETS

Revision: 9

16. Other information

General information For advice on chemical emergencies, spillages, fires or first aid in relation to this product

please contact the relevant emergency number below: EU/English Speakers - +44 (0) 1235 239 670 (NCEC) Arabic Speakers - +44 (0) 1235 239 671 Asia/Pacific countries - +65 3158

1074 Within Mainland China: +86 532 8388 9090 (NRCC).

To/From China: +86 10 5100 3039 (NCEC)

Revision comments Section 15 revision, added US regulatory status and EPA Reg. No.

Issued by BWA Water Additives Regulatory Group, +44(0)1618646699

Revision date 3/28/2016

Revision 9

SDS No. 11306

Hazard statements in full H272 May intensify fire; oxidizer.

H302 Harmful if swallowed.

H314 Causes severe skin burns and eye damage.

H317 May cause an allergic skin reaction. H318 Causes serious eye damage. H400 Very toxic to aquatic life.

KIWA Certification

NSF Non Food Program

NSF/ANSI Standard 60

For safety reasons it is IMPERATIVE that customers:-

^{1.} Ensure that all those within their control who use the products are supplied with all relevant information contained within the Safety Data Sheet and Technical Bulletin concerning the applications for which the product is designed and any instructions and warnings contained therein.

^{2.} Consult BWA Water Additives before using or supplying the product for any other applications. The information contained herein is based on the present state of our knowledge and is intended to describe our products from the point of view of safety requirements. It should not therefore be construed as guaranteeing specific properties.



WEST -358





HMS RATING: HEALTH 2 FLAMMABILITY 0 REACTIVITY 0 OTHER C

Safety Data Sheet WEST C-358

SECTION 1: Identification

1.1 Product identifier

Product name WEST C-358 Cooling Tower Inhibitor

Product number C-358

1.2 Recommended use An aqueous corrosion and scale inhibitor. This product is designed

specifically for the control of corrosion and mineral scales in open

circulating cooling water systems.

1.3 Supplier's details

Name Water & Energy Systems Technology, Inc.

Address 13109 Arctic Cr.

Santa Fe Springs, CA 90670

Telephone (562) 921-5191

1.4 Emergency phone number(s) Chem-Tel (U.S.): (800) 255-3924

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

GHS classification in accordance with OSHA (29 CFR 1910.1200)

- Skin corrosion/irritation (chapter 3.2), Cat. 1A
- Eye damage/irritation (chapter 3.3), Cat. 1
- Corrosive to metals (chapter 2.16), Cat. 1

2.2 GHS label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)

H290 May be corrosive to metals
H302 Harmful if swallowed

H314 Causes severe skin burns and eye damage

H332 Harmful if inhaled

Precautionary statement(s)

P260 Do not breathe fume/gas/mist/vapors/spray.
P264 Wash hands thoroughly after handling.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 1 of 6

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



Safety Data Sheet WEST C-358

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse

skin with water/shower.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove

contact lenses if present and easy to do. Continue rinsing. Call a POISON CENTER or doctor/physician if you feel unwell. Store in a corrosive resistant container with a resistant inner liner.

SECTION 3: Composition/information on ingredients

Mixtures 3.1

P312

P406

Hazardous components

1. Sodium Hydroxide

10 - 15 % (Weight) Concentration

CAS no. 1310-73-2

2. Azole Salts

Concentration 1 - 5 % (Weight)

CAS no. NA

Trade secret statement (OSHA 1910.1200(i))

Specific chemical identity and/or exact percentage of composition has been withheld as a trade secret.

SECTION 4: First-aid measures

Description of necessary first-aid measures

General advice Avoid contact with skin, eyes and clothing. Wash hands before breaks and

immediately after handling the product.

If inhaled Remove to fresh air. If not breathing, give artificial respiration. Get immediate

medical attention.

In case of skin contact Immediately remove clothing under safety shower. Flush skin with large

amounts of soap and water. Wash clothing separately before reuse.

In case of eye contact Flush eye with water for 15 minutes. Get medical attention.

If swallowed Do NOT induce vomiting. Give victim large quantities of water. Call a

physician or poison control center immediately. Never give anything by

mouth to an unconscious person.

4.2 Most important symptoms/effects, acute and delayed

ACUTE: Multiple small burns can result from exposure.

CHRONIC: Death may occur if penetration into vital areas occurs. Scarring may so constrict or destroy damaged

tissue that extensive corrective surgery may be required.

SECTION 5: Fire-fighting measures

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 2 of 6

LA-UR-19-22215 Attachment E



Safety Data Sheet WEST C-358

5.1 Suitable extinguishing media

No data available.

5.2 Specific hazards arising from the chemical

No data available.

5.3 Special protective actions for fire-fighters

No special fire fighting procedures.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

See section 8.

6.2 Environmental precautions

Do not flush to sewer, drains, or surface waters.

Methods and materials for containment and cleaning up

Clean up spills immediately, observing precautions in Exposure Protection section of this SDS. Flush with a water spray. Pick up wash liquid with absorbent or vacuum and place in a disposable container. Large spills should be handled according to a predetermined plan.

SECTION 7: Handling and storage

Precautions for safe handling

Use with adequate ventilation. Follow all SDS/label precautions even after container is emptied because they may retain product residues.

7.2 Conditions for safe storage, including any incompatibilities

Contents may develop pressure upon prolonged storage. Loosen closure cautiously before opening.

7.3 Specific end use(s)

No data available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

1. Sodium hydroxide (CAS: 1310-73-2)

PEL (Inhalation): 2 mg/m3 Ceiling (OSHA) TLV (Inhalation): 2 mg/m3 Ceiling (ACGIH)

8.2 Appropriate engineering controls

Local exhaust ventilation may be necessary to control any air containments to within their PELs (TLVs) during the use of this product.

8.3 Individual protection measures, such as personal protective equipment (PPE) Eve/face protection

Wear safety glasses with side shields (or goggles) and a face shield.

Nitrile rubber, PVC, or Neoprene gloves are suitable protective materials.

Body protection

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 3 of 6

LA-UR-19-22215 Attachment E



Safety Data Sheet **WEST C-358**

Where splashing is possible, full chemically resistant protective clothing, rubber apron and boots are required.

Respiratory protection

NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited.

Thermal hazards

No data available.

Environmental exposure controls

No data available.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance/form Amber or Yellow Liquid

Odor Bland рН 12.0

Melting point/freezing point No data available.

Initial boiling point and boiling range >212 F

Flash point No data available. Evaporation rate <1 (butyl acetate = 1) Flammability (solid, gas) No data available. Vapor pressure No data available. Vapor density No data available.

Relative density 1.102 Solubility(ies) Water Soluble

SECTION 10: Stability and reactivity

10.1 Reactivity

No data available.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available.

10.4 Conditions to avoid

Do not mix with other industrial chemicals.

10.5 Incompatible materials

Acids, oxidizing materials, halogen compounds, copper, zinc and galvanized metals.

10.6 Hazardous decomposition products

Carbon monoxide, carbon dioxide, ammonia, and oxides of nitrogen.

SECTION 11: Toxicological information

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 4 of 6

LA-UR-19-22215 Attachment E E-17 of 40



Information on toxicological effects

Acute toxicity

No data available.

Skin corrosion/irritation

No data available.

Serious eye damage/irritation

No data available.

Respiratory or skin sensitization

No data available.

Germ cell mutagenicity

No data available.

Carcinogenicity

This product's ingredients are not found in the federal or Cal OSHA NTP, or IARC lists of suspected cancer causing agents.

Reproductive toxicity

No data available.

STOT-single exposure

No data available.

STOT-repeated exposure

No data available.

Aspiration hazard

No data available.

SECTION 12: Ecological information

Toxicity

No data available.

Persistence and degradability

No data available.

Bioaccumulative potential

No data available.

Mobility in soil

No data available.

Results of PBT and vPvB assessment

No data available.

SECTION 13: Disposal considerations

Disposal of the product

Dispose of all waste in accordance with federal, state, and local regulations.

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 5 of 6

LA-UR-19-22215 Attachment E



Disposal of contaminated packaging

Dispose of as unused product.

Waste treatment

No data available.

Sewage disposal

No data available.

SECTION 14: Transport information

DOT (US)

UN Number: UN 1719

Class: 8

Packing Group: II

Proper Shipping Name: CAUSTIC ALKALI LIQUID, N.O.S.

Marine pollutant: No

Shipping Label: Corrosive - 8

Other Shipping Information: CONTAINS SODIUM HYDROXIDE, LIQUID



SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)
FIRE: NO PRESSURE GENERATING: NO REACTIVITY: NO ACUTE: YES CHRONIC: NO

SECTION 16: Other information

Further information/disclaimer

The information contained herein is provided in good faith and believed to be correct as of the date hereof. WEST, Inc. makes no representation as to the comprehensiveness or accuracy of the information. It is expected that the individuals receiving the information will exercise their independent judgment in determining its appropriateness for a particular purpose. Accordingly, WEST, Inc. will not be responsible for damages of any kind resulting in the use of or reliance upon such information. No representations, or warranties, either expressed or implied, of merchantability fitness for a particular purpose or of any other nature are made hereunder with respect to the information set fourth herein or to the product to which the information refers.

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 6 of 6



WEST R-630





HMS RATING: HEALTH 1 FLAMMABILITY 0 REACTIMTY 0 OTHER C

Safety Data Sheet WEST R-630

SECTION 1: Identification

1.1 Product identifier

Product name WEST R-630 Sulfite

Product number R-630

1.2 Recommended use An aqueous solution of sodium and potassium sulfites, bisulfites and

metabisulfites designed specifically for halogen removal in process water

systems.

1.3 Supplier's details

Name Water & Energy Systems Technology, Inc.

Address 13109 Arctic Cr.

Santa Fe Springs, CA 90670

Telephone (562) 921-5191

Emergency phone number(s) Chem-Tel (U.S.): (800) 255-3924

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

GHS classification in accordance with OSHA (29 CFR 1910.1200)

- Skin corrosion/irritation (chapter 3.2), Cat. 3

- Eye damage/irritation (chapter 3.3), Cat. 2B

2.2 GHS label elements, including precautionary statements

Signal word	Warning
Hazard statement(s)	
H316	Causes mild skin irritation
H320	Causes eye irritation
Precautionary statement(s)	
P332+P313	If skin irritation occurs: Get medical advice/attention.
P264	Wash hands thoroughly after handling.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P337+P313	If eye irritation persists: Get medical advice/attention.

SECTION 3: Composition/information on ingredients

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 1 of 6



3.1 Mixtures

This product does not contain any hazardous materials under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

Trade secret statement (OSHA 1910.1200(i))

Specific chemical identity and/or exact percentage of composition has been withheld as a trade secret.

SECTION 4: First-aid measures

Description of necessary first-aid measures

General advice Avoid contact with skin, eyes and clothing. Wash hands before breaks and

immediately after handling the product.

If inhaled Remove to fresh air. If not breathing, give artificial respiration. Get immediate

medical attention.

In case of skin contact Immediately remove clothing under safety shower. Flush skin with large

amounts of soap and water. Wash clothing separately before reuse.

In case of eye contact Flush eye with water for 15 minutes. Get medical attention.

If swallowed Do NOT induce vomiting. Give victim large quantities of water. Call a

physician or poison control center immediately.

Personal protective equipment for first-aid responders

No data available.

4.2 Most important symptoms/effects, acute and delayed

No data available.

Indication of immediate medical attention and special treatment needed, if necessary

No data available.

SECTION 5: Fire-fighting measures

Suitable extinguishing media

No data available.

5.2 Specific hazards arising from the chemical

No data available.

Special protective actions for fire-fighters

No special fire fighting procedures.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Wear appropriate personal protective equipment as specified in Section 8.

6.2 **Environmental precautions**

Do not flush to sewer.

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 2 of 6

LA-UR-19-22215 Attachment E



Methods and materials for containment and cleaning up

No data available.

SECTION 7: Handling and storage

Precautions for safe handling

Use with adequate ventilation. Follow all SDS/label precautions even after container is emptied because they may retain product residues.

Conditions for safe storage, including any incompatibilities

Contents may develop pressure upon prolonged storage. Loosen closure cautiously before opening.

SECTION 8: Exposure controls/personal protection

Control parameters

No exposure limits noted for ingredient(s).

Appropriate engineering controls

Local exhaust ventilation may be necessary to control any air containments to within their PELs (TLVs) during the use of this product.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear safety glasses with side shields (or goggles) and a face shield.

Skin protection

Nitrile rubber, PVC, or Neoprene gloves are suitable protective materials.

Body protection

Where splashing is possible, full chemically resistant protective clothing, rubber apron and boots are required.

Respiratory protection

NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited.

Thermal hazards

No data available

Environmental exposure controls

No data available.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance/form Clear pink liquid No appreciable odor. Odor Odor threshold No data available. ~6.5

Melting point/freezing point No data available.

Initial boiling point and boiling range 212 F

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 3 of 6

LA-UR-19-22215 Attachment E



Flash point No data available. <1 (butyl acetate = 1) Evaporation rate Flammability (solid, gas) No data available. No data available. Vapor pressure Vapor density No data available. Relative density 1.251 Solubility(ies) Water Soluble Partition coefficient: n-octanol/water No data available. No data available. Auto-ignition temperature Decomposition temperature No data available. Viscosity No data available. Explosive properties No data available. Oxidizing properties No data available.

SECTION 10: Stability and reactivity

10.1 Reactivity

No data available.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available.

10.4 Conditions to avoid

Generation of heat by reaction with water or acids.

10.5 Incompatible materials

Acids, oxidizing materials, halogen compounds, copper, zinc and galvanized metals.

10.6 Hazardous decomposition products

Carbon monoxide, carbon dioxide, ammonia, and oxides of nitrogen.

SECTION 11: Toxicological information

Information on toxicological effects

Acute toxicity

No data available.

Skin corrosion/irritation

No data available.

Serious eye damage/irritation

No data available.

Respiratory or skin sensitization

No data available.

Germ cell mutagenicity

No data available.

Carcinogenicity

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 4 of 6



This product's ingredients are not found in the federal or Cal OSHA NTP, or IARC lists of suspected cancer causing agents.

Reproductive toxicity

No data available.

STOT-single exposure

No data available.

STOT-repeated exposure

No data available.

Aspiration hazard

No data available.

SECTION 12: Ecological information

Toxicity

No data available.

Persistence and degradability

No data available.

Bioaccumulative potential

No data available.

Mobility in soil

No data available.

Results of PBT and vPvB assessment

No data available.

SECTION 13: Disposal considerations

Disposal of the product

Dispose of all waste in accordance with federal, state, and local regulations.

Disposal of contaminated packaging

Dispose of as unused product.

Waste treatment

No data available.

Sewage disposal

No data available.

SECTION 14: Transport information

DOT (US)

Proper Shipping Name: D.O.T. NONREGULATED WATER TREATMENT LIQUID COMPOUND

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 5 of 6



SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT) FIRE: NO PRESSURE GENERATING: NO REACTIVITY: NO ACUTE: YES CHRONIC: NO

SECTION 16: Other information

Further information/disclaimer

The information contained herein is provided in good faith and believed to be correct as of the date hereof. WEST, Inc. makes no representation as to the comprehensiveness or accuracy of the information. It is expected that the individuals receiving the information will exercise their independent judgment in determining its appropriateness for a particular purpose. Accordingly, WEST, Inc. will not be responsible for damages of any kind resulting in the use of or reliance upon such information. No representations, or warranties, either expressed or implied, of merchantability fitness for a particular purpose or of any other nature are made hereunder with respect to the information set fourth herein or to the product to which the information refers.

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 6 of 6



BRIGHT DYES FLT YELLOW/GREEN LIQUID





Safety Data Sheet

Issue Date: 04-Oct-2013 Revision Date: 06-Feb-2017 Version Number: 1.1

1. Identification

Product Identifiers

Product Name: Bright Dyes® FLT Yellow/Green Liquid

Product Number: 106001

Recommended Use & Restrictions on Use

Water tracing & leak detection dye

Manufacturer/Supplier

Kingscote Chemicals, Inc. 3334 South Tech Blvd. Miamisburg, OH 45342

U.S.A.

Emergency Telephone Number

Company Telephone Number: (937) 886-9100

Emergency Telephone (24 hr): INFOTRAC (800) 535-5053 (North America)

+1-352-323-3500 (International)

2. Hazards Identification

<u>Classification</u>

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least

15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs:

 $Get\ medical\ advice/attention.$

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek

medical attention immediately.

Page 1 of 6

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Liquid

Ingestion

Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give anything by mouth to an unconscious person. Get medical attention if large

quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation.

Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the

system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media

Water spray (fog). Carbon dioxide (CO2). Dry chemical. Regular foam.

Unsuitable Extinguishing Media

Not determined

Specific Hazards Arising from the Chemical

Product is not flammable. Burning/combustion may produce oxides of carbon and nitrogen (NOx).

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or

groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area

with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices.

Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing

should be thoroughly washed before reuse.

Page 2 of 6

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry, and well-

ventilated area. Keep from freezing.

Incompatible Materials Acids.

8. Exposure Controls / Personal Protection

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection Goggles.

Skin & Body Protection Rubber gloves. Suitable protective clothing.

Respiratory Protection No protection is ordinarily required under normal conditions of use.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practices.

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

 Physical State
 Liquid
 Odor
 None apparent

 Appearance
 Yellow/green liquid
 Odor Threshold
 Not determined

 Color
 Yellow/green

PropertyValuespH>8.0Melting/Freezing Point~32° FBoiling Point/Range~212° FFlash PointNot applicable

Evaporation Rate 1.8

Flammability (solid, gas)
Upper Flammability Limits
Lower Flammability Limits
Vapor Pressure
Liquid – not applicable
Not applicable
Not applicable

Vapor Density 0.6

Relative Density
Specific Gravity
Solubility
Partition Coefficient
Auto-ignition Temperature
Decomposition Temperature
Viscosity
Not applicable
Not determined
Not determined
Not determined
Not determined
Not determined

Page 3 of 6



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

10. Stability and Reactivity

Reactivity

Not reactive under normal conditions.

Chemical Stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials

Acids. Strong oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation Avoid breathing vapors or mists.

Ingestion Do not ingest.

Skin Contact May cause an allergic skin reaction.

Eye Contact Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure

May cause an allergic skin reaction.

Numerical Measures of Toxicity

Not determined

Symptoms Associated with Exposure

See Section 4 of this SDS for symptoms.

Carcinogenicity

NTP None

IARC None

OSHA None

Page **4** of **6**

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Liquid

12. Ecological Information

Ecotoxicity

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Not available

Persistence/Degradability

Not determined

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. Disposal Considerations

Waste Disposal Methods

Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

Note

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

OMDG Not regulated

15: Regulatory Information

International Inventories

TASCA This product is not subject to TSCA 12(b) reporting requirements.

U.S. Federal Regulations

CERCLA This material, as supplied, does not contain any substances regulated as

hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Page 5 of 6



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization

Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of

Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants

pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable

state right-to-know regulations.

16: Other Information

	201 Calci Michigatori				
HMIS Health Hazards	Flammability 0	Instability O	Special Hazards Not determined		
<u>NFPA</u> Health Hazards 1	Flammability O	Physical Hazards O	Personal Protection B		
Issue Date	04-Oct-2013				
Revision Date	06-Feb-2017				
Revision Note	Content Review				

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Page 6 of 6



BRIGHT DYES FLT YELLOW/GREEN TABLET





Safety Data Sheet

Issue Date: 09-Nov-2013 Revision Date: 06-Feb-2017 Version Number: 2.1

1. Identification

Product Identifiers

Product Name: Bright Dyes® FLT Yellow/Green Tablet

Product Number: 101101

Recommended Use & Restrictions on Use

Water tracing & leak detection dye

Manufacturer/Supplier

Kingscote Chemicals, Inc. 3334 South Tech Blvd. Miamisburg, OH 45342

U.S.A.

Emergency Telephone Number

Company Telephone Number: (937) 886-9100

Emergency Telephone (24 hr): INFOTRAC (800) 535-5053 (North America)

+1-352-323-3500 (International)

2. Hazards Identification

Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least

15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs:

Get medical advice/attention.

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek

medical attention immediately.

Page 1 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Tablet

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give

anything by mouth to an unconscious person. Get medical attention if large

quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation.

Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the

system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media

Water spray (fog). Carbon dioxide (CO2). Dry chemical.

Unsuitable Extinguishing Media

Not determined

Specific Hazards Arising from the Chemical

Remote possibility of dust explosion. Burning may produce oxides of carbon and nitrogen (NOx).

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or

groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area

with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices.

Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing

should not be allowed out of the workplace.

Page 2 of 6

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



Bright Dyes® FLT Yellow/Green Tablet Revision Date: 06-Feb-2017

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry, and well-

ventilated area. Store away from heat, sparks, open flame or any other

ignition source.

Incompatible Materials Bromine trifluoride. Lithium. Strong acids, bases, and oxidizing agents.

8. Exposure Controls / Personal Protection

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection Avoid contact with eyes.

Skin & Body Protection Rubber gloves. Suitable protective clothing.

Respiratory Protection Use NIOSH-approved dust mask if dusty conditions exist.

Handle in accordance with good industrial hygiene and safety practices. **Hygiene Measures**

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

Physical State Solid Odor None apparent **Appearance** Orange tablet **Odor Threshold** Not determined

Color Orange

Property **Values** Not applicable pН Melting/Freezing Point Not applicable Not applicable **Boiling Point/Range** Flash Point Not applicable Not applicable **Evaporation Rate** Flammability (solid, gas) Not flammable **Upper Flammability Limits** Not applicable **Lower Flammability Limits** Not applicable Vapor Pressure Not applicable **Vapor Density** Not applicable Not applicable **Relative Density Specific Gravity** Not applicable

Solubility Highly soluble in water with small amounts of insoluble residue

Partition Coefficient Not determined **Auto-ignition Temperature** Not determined **Decomposition Temperature** Not determined Viscosity Not determined

Page 3 of 6



Bright Dyes® FLT Yellow/Green Tablet

Revision Date: 06-Feb-2017

10. Stability and Reactivity

Reactivity

Not reactive under normal conditions.

Chemical Stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials

Bromine trifluoride. Lithium. Strong acids, bases, and oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation Avoid inhalation of dust.

Ingestion Do not ingest.

Skin Contact May cause an allergic skin reaction.

Eye Contact Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure

May cause an allergic skin reaction.

Numerical Measures of Toxicity

Not determined

Symptoms Associated with Exposure

See Section 4 of this SDS for symptoms.

Carcinogenicity

NTP None

IARC None

OSHA None

Page 4 of 6



Bright Dyes® FLT Yellow/Green Tablet

Revision Date: 06-Feb-2017

12. Ecological Information

Ecotoxicity

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Not available

Persistence/Degradability

This product is biodegradable.

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. Disposal Considerations

Waste Disposal Methods

Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

Note

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

OMDG Not regulated

15: Regulatory Information

International Inventories

Not determined

U.S. Federal Regulations

CERCLA This material, as supplied, does not contain any substances regulated as

hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Page 5 of 6



Bright Dyes® FLT Yellow/Green Tablet

Revision Date: 06-Feb-2017

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization

Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of

Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants

pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable

state right-to-know regulations.

16: Other Information

HMIS Health Hazards	Flammability O	Instability O	Special Hazards Not determined
NFPA Health Hazards 1	Flammability O	Physical Hazards O	Personal Protection B
Issue Date	09-Nov-2013		
Revision Date	06-Feb-2017		
Revision Note	Content Review	Content Review	

<u>Disclaimer</u>

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End of Safety Data Sheet

Page 6 of 6



Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application Outfall 03A160 Fact Sheet

Science and Technology Operations (STO)
National High Magnetic Field Laboratory (NHMFL)
Cooling Towers





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Table of Contents

1.0	OUTFALL LOCATION [Section I]	5
2.0	FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]	5
2.1	Process Schematic and Water Balance [II.A]	5
2.2	Water Treatment Processes [II.B]	5
2.3	Discharge Rate and Frequency [II.C]	6
3.0	PRODUCTION [Section III]	6
4.0	IMPROVEMENTS [Section IV]	6
5.0	INTAKE AND EFFLUENT CHARACTERISTICS [Section V]	7
5.1	Analytical Data [V.A, B, and C]	7
5.2	Potential Pollutants [V.D]	7
6.0	POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]	7
7.0	BIOLOGICAL TOXICITY TESTING DATA [Section VII]	7
8.0	CONTRACT ANALYSIS INFORMATION [Section VIII]	7
ATTAC	CHMENT A: Location Map for Outfall 03A160	A-1
ATTAC	CHMENT B: Process Schematic and Water Balance	B-1
ATTAC	CHMENT C: Photographs	
ATTAC	CHMENT D – Discharge Monitoring Report (DMR) Summary	D-1
ATTAC	CHMENT E: Safety Data Sheets	E-1

List of Tables

- 1 Sources for Discharges to Outfall 03A160
- Wastewater Treatment Codes Assigned to Outfall 03A160
- 3 List of Treatment Chemicals used in the Operations that Contribute to Outfall 03A160
- 4 Flow Rates and Frequencies for Discharges to Outfall 03A160
- 5 List of New and/or Proposed Treatment Chemicals for Future Operations at Outfall 03A160
- 6 Potential Pollutants by Source for Outfall 03A160
- 7 List of Independent Laboratories Used for NPDES Water Analysis



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INDUSTRIAL AND SANITARY OUTFALLS 2019 NPDES PERMIT RE-APPLICATION Outfall 03A160 Fact Sheet

1.0 OUTFALL LOCATION [Section I]

Outfall ID No.:	03A160	Outfall Location:	Technical Area 35
Category:	03A, Treated Cooling Water	Originating Structure	TA-35-124, 294, 301
	Discharges	for the Discharge:	
Flow Type:	Intermittent	Receiving Stream:	Ten Site Canyon, Tributary to Mortandad
			Canyon Water Quality Segment 20.6.4.128
			NMAC
Longitude:	106°17'49"W	Latitude:	35°51'47"N

2.0 FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]

Outfall 03A160 is located at TA-35 and discharges to Ten Site Canyon, A tributary to Mortandad Canyon, in Water Quality Segment 20.6.4.128 NMAC. The outfall discharges treated cooling water that originates from TA-35-124, 294 and 301 at the National High Magnetic Field Laboratory (NHMFL). Attachment A provides a location map. The cooling tower blowdown is comprised of potable water that is treated by the cooling tower water treatment system. Table 1 identifies the discharge source, the source location, and source composition.

	Table 1				
	Sources for Discharges to Outfall 03A160				
TA	TA Building Source Transportation Mode Discharge Source				
		Type	(Piping, Truck etc.)	Source	Composition
35	124, 294,		Piping	National High Magnetic	Treated Cooling Tower Blowdown
	301	Cooling		Field Laboratory (NHMFL)	Potable Water Used as Makeup
				Cooling Towers	Water

2.1 Process Schematic and Water Balance [II.A]

A process schematic line drawing that shows the route taken by water from intake to the discharge at Outfall 03A160 is provided in Attachment B. This drawing includes all operations that contribute cooling water to the discharge at Outfall 03S160. A water balance is also provided on the process schematic with average flows for the cooling tower intakes and blowdown. The water balance is based upon actual data collected from cooling tower operations personnel and the flow meter/totalizer associated with the outfall.

2.2 Water Treatment Processes [II.B]

The cooling towers provide cooling water to a process heat exchanger which cools a 1400 Mega Watt (MW) generator (35-301) and power supplies (35-294), and Helium recovery system (35-294). These towers and the associated heat exchanger are maintained using a chemical corrosion inhibitor. The towers may be operated year round and include conductivity sensors to control blow down and the addition of makeup water. Blow down from the towers is routed to the Sanitary Wastewater System (SWWS) facility or may be discharged to Outfall 03160. Table 2 identifies the waste water treatment codes associated with the water treatment system. Attachment C provides photographs of the outfall, cooling towers, and the wastewater treatment equipment.

	Table 2				
	Wastewater Treatment Codes Assigned to Outfall 03A160				
Treatment Code Description Justification					
2-E	Dechlorination	Chlorine Scavenger Chemicals are Added			

The water treatment processes identified in Table 2 utilize chemicals to monitor the water quality in the cooling tower, control corrosion, limit biological growth, and de-chlorinate blowdown prior to discharge. Table 3 provides a list of the chemicals used to treat the water in the cooling towers.

Table 3 List of Treatment Chemicals used in the Operations that Contribute to Outfall 03A160					
Source	Toxic Pollutant and/or Haza Substances Table 2C-3 or				
TA-35-124, 294 and 301	Vita-D-Chlor Tablets	Dechlorination	Ascorbic Acid	NA	
National High Magnetic Field Laboratory	Bright Dyes FLT Yellow/Green Liquid	Water Line & Drain Tracing	NA	NA	
(NHMFL) Cooling Towers	Bright Dyes FLT Yellow/Green Tablet	Water Line & Drain Tracing	NA	NA	

2.3 Discharge Rate and Frequency [II.C]

The discharge rates and frequencies for Outfall 03A160 are provided in Table 4.

Table 4 Flow Rates and Frequencies for Discharges to Outfall 03A160							
	Frequency Flow Rates and Volum		olumes				
Source ^a	Days/Week	Months	Average (MGD)	Maximum (MGD)	Average Volume (GPD)	Maximum Volume (GPD)	Duration (days)
National High Magnetic Field Laboratory (NHMFL) Cooling Towers	2	7	0.002567	0.00647	2,567	6,470	87

Calculated between June 2017 and May 2018.
 MGD = million gallons per day
 GPD = gallons per day

3.0 PRODUCTION [Section III]

Section III is not applicable to Outfall 03A160.

4.0 IMPROVEMENTS [Section IV]

The NHMFL is currently constructing a water treatment system for the cooling towers. This system will add corrosion inhibitor and biocide to the towers automatically using a programmable logic controller (PLC) monitoring system. A Notice of Change will be submitted for these future changes prior to their implementation and impact to the outfall. Table 5 provides an estimate for the future flow rates and frequencies of makeup water and blowdown when the new towers come online. Attachment B provides a proposed schematic and water balance for the future configuration.

Table 5 List of New and/or Proposed Treatment Chemicals for Future Operations at Outfall 160				
Chemical Name	me Reason for Use Toxic Pollutant and/or Hazardous Substances Table 2C-3 or 2C-4			
GC Formula 2011	Corrosion Inhibitor	phosphonobutane	NA	
LT		tricarboxylic acid	NA	
		monosodium phosphate	NA	
		benzotriazole	NA	
		phosphinocarboxylic acid	NA	
GC Formula 314-T	Biocide	1-bromo-3-chloro-5,5-dimethyl hydantoin (chlorine source)	2C-4	
GC Formula 315	Biocide	5-chloro-2-methyl-4-isothiazolin-3-one (chlorine source)	2C-4	
		2-methyl-4-isothiazolin-3-one	NA	
		magnesium nitrate	NA	
		magnesium chloride	NA	
WEST R-630	Dechlorination	Sodium Bisulfite	2C-4	

5.0 INTAKE AND EFFLUENT CHARACTERISTICS [Section V]

5.1 Analytical Data [V.A, B, and C]

The discharge to Outfall 03A160 was routed to SWWS on May 5, 2018. It is the intent of the facility to no longer discharge to the outfall unless there is an operational upset that prevents cooling water from being discharged to the SWWS. The current configuration of the cooling water discharges prevented the collection of a sample for this permit application. The analytical results provided for the Outfall 03A160 Permit Reapplication on the Form 2C were provided from the following sources:

- 2012 Permit Application
- Discharge Monitoring Report summary for Outfall 03A0160 from October 2014 to May 2018 (Attachment D).
- Hardness = 118 mg/L (CaCO₃)

The discharge monitoring report summary does not include data between May 2018 and September 201 because the effluent from the NHMFL was not discharged to Ten Site Canyon. Effluent from the NHMFL was routed in May 2018 to the SWWS Facility under a waste stream profile.

5.2 Potential Pollutants [V.D]

The treatment chemicals currently associated with the cooling tower water treatment system and the use of potable makeup water constitute the pollutant load of the discharge to Outfall 03A160. Table 6 identifies the Table 2C-3 and 2C-4 pollutants by discharge source.

Table 6 Potential Pollutants by Source for Outfall 03A160				
Source POTENTIAL Analytical Toxic Pollutant and/or Hazardous Result Substances Table 2C-3 or 2C-4				
Potable Water used as Makeup in the NHMFL Cooling Towers	Chlorine	2C-4	Residual Chlorine a = 0	

a. This analytical result is based upon the discharge monitoring report data submitted for Outfall 03A160 between October 2014 and May 2018.

NMHFL = National High Magnetic Field Laboratory

The safety data sheets associated with the chemicals used to treat water are provided in Attachment F.

6.0 POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]

Section VI is not applicable to Outfall 03A160.

7.0 BIOLOGICAL TOXICITY TESTING DATA [Section VII]

Section VII is not applicable to Outfall 03A160.

8.0 CONTRACT ANALYSIS INFORMATION [Section VIII]

The analytical results from the samples collected for the 2012 Permit application were used for this permit application. These samples were submitted to the independent laboratories identified in Table 7.

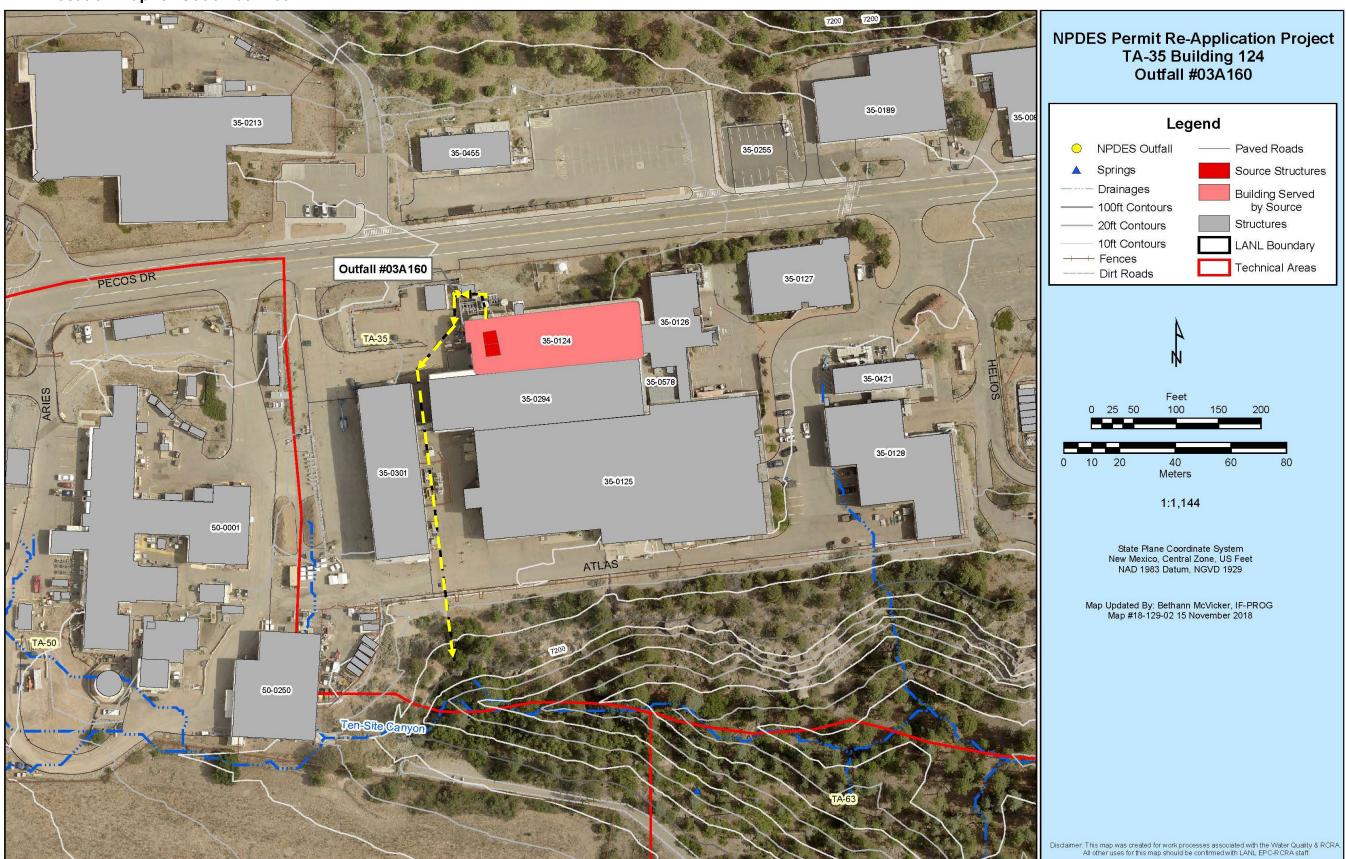
Table 7 List of Independent Laboratories Used for NPDES Water Analysis					
Laboratory Name	Laboratory Name Address and Contact Info Analytes				
GEL Laboratories LLC	2040 Savage Road Charleston SC 29407 (843) 556-8171	Biological Oxygen Demand, General Chemistry, Pesticides, Polychlorinated Biphenyls, Radiochemistry, Semi-Volatile Organic Compounds, Total Metals, Total Suspended Solids, Volatile Organic Compounds			



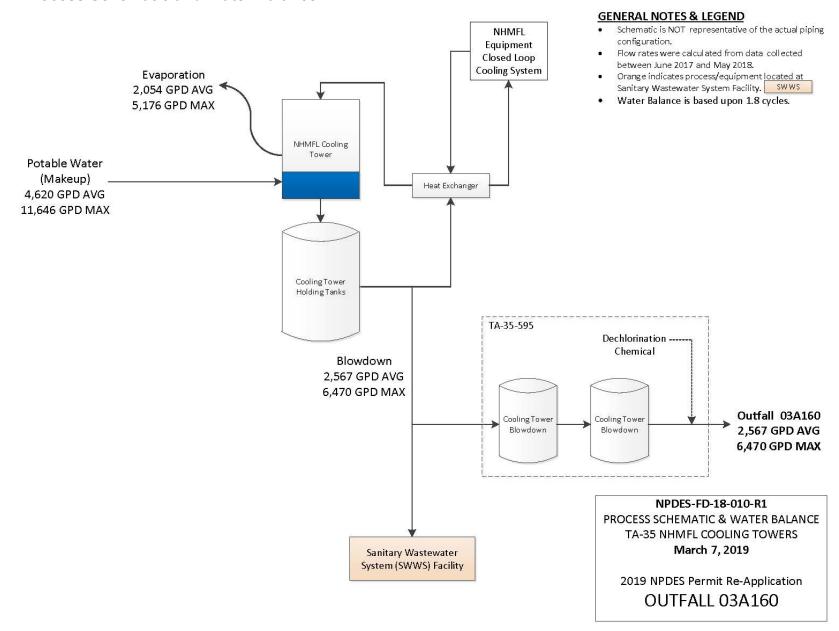
Table 7 List of Independent Laboratories Used for NPDES Water Analysis		
Laboratory Name	Address and Contact Info	Analytes
SWRI Southwest Research Institute	Division 01 6220 Culebra Rd San Antonio TX7838	Arsenic, Selenium
New Mexico Water Testing Laboratory, Inc.	401 North Coronado Ave Espanola, NM 87532 (505) 929-4545	E.coli
Cape Fear Analytical LLC	3306 Kitty Hawk Road Suite 120 Wilmington, NC 28405 (910) 795-0421	TCDD (Dioxin)

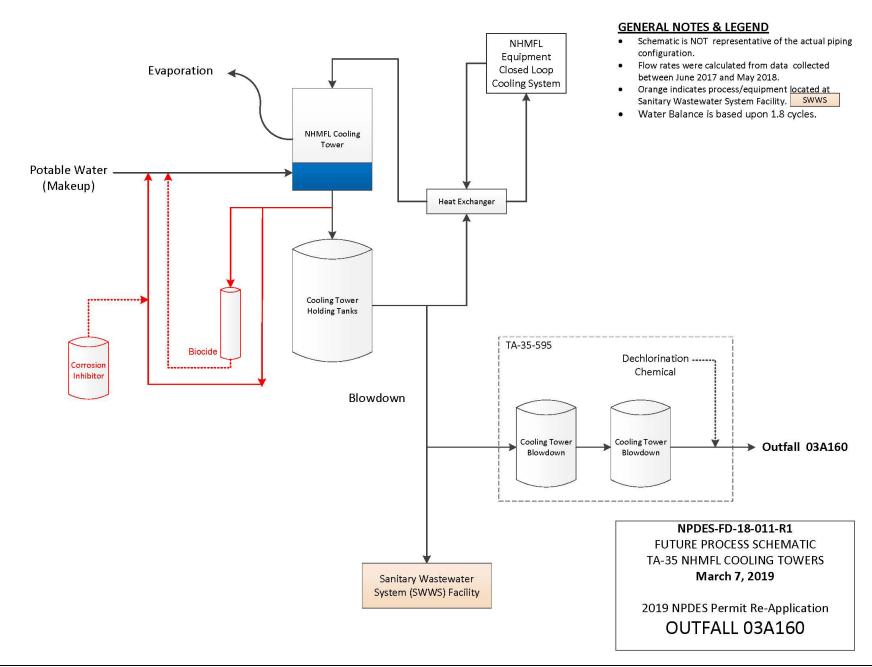


ATTACHMENT A: Location Map for Outfall 03A160



ATTACHMENT B: Process Schematic and Water Balance







ATTACHMENT C: Photographs

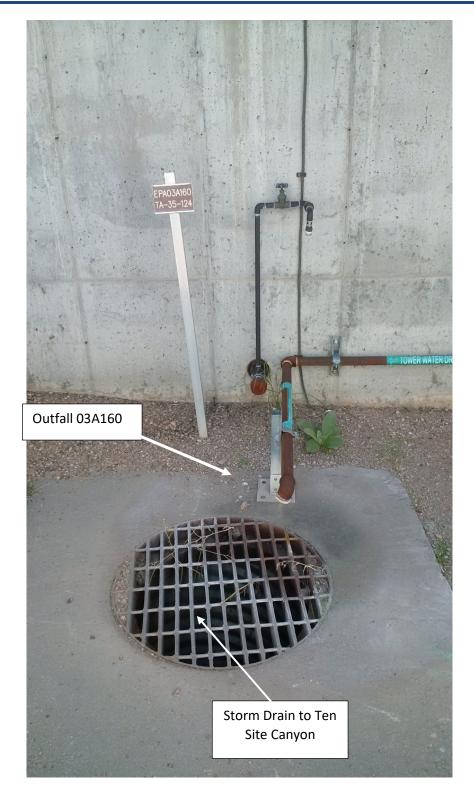
Photograph ID No.	Photograph Title	
NPDES-03A160-18-001	Outfall 03A160 Location	
NPDES-03A160-18-002	Outfall 03A160 Condition and Accessiblity at Discharge Location	
NPDES-03A160-18-003	Outfall 03A160 Receiving Stream Ten Site Canyon, Tributary to Mortandad Canyon, Water Quality Segment 20.6.4.128 NMAC	
NPDES-03A160-18-004	NHMFL Cooling Tower Holding Tanks	
NPDES-03A160-18-005	NHMFL Cooling Tower Blowdown Piping Connection to SWWS	
NPDES-03A160-18-006	NHMFL Cooling Tower Blow Down Storage Tanks Prior to Discharge to Outfall 03A60 (inactive)	



Photograph - NPDES-03A160-18-001 **Outfall 03A160 Location**

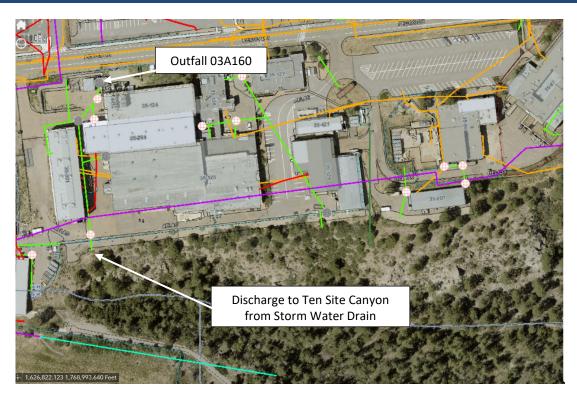
LA-UR-19-22215 Attachment C C-1 of 4



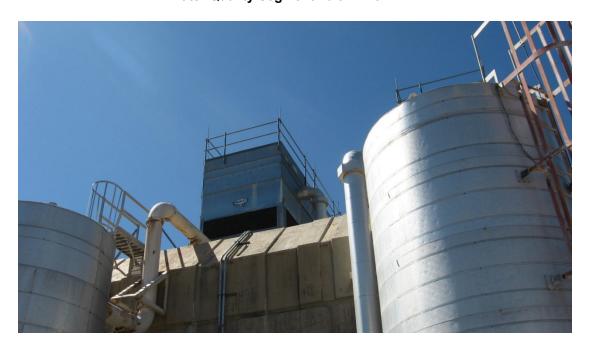


Photograph - NPDES-03A160-18-002
Outfall 03A160 Condition and Accessibility at Discharge Location

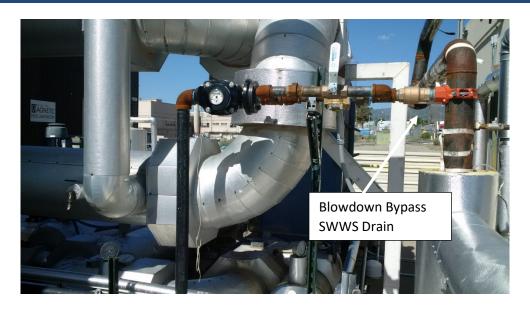




Photograph - NPDES-03A160-18-003
Outfall 03A160 Receiving Stream Ten Site Canyon, Tributary to Mortandad Canyon,
Water Quality Segment 20.6.4.128 NMAC



Photograph - NPDES-03A160-18-004 NHMFL Cooling Tower Holding Tanks



Photograph - NPDES-03A160-18-005
NHMFL Cooling Tower Blowdown Piping Connection to SWWS



Photograph - NPDES-03A160-18-006 NHMFL Cooling Tower Blow Down Storage Tanks Prior to Discharge to Outfall 03A60 (inactive)

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



ATTACHMENT D - Discharge Monitoring Report (DMR) Summary

					Quantity o	r Loading		Quality or C	Concentration	1							
OUTFALL			Monitoring		•									Number of			
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency		
03A160	TA35-294, 301	2014	Oct	Flow (Totalized Est.)	0.002298	0.006148	GPD							9	Daily		
03A160	TA35-294, 301	2014	Nov	Flow (Totalized Est.)	0.003129	0.004527	MGD							7	Daily		
03A160	TA35-294, 301	2014	Dec	Flow (Totalized Est.)	0.002979	0.004570	MGD							7	Daily		
03A160	TA35-294, 301	2015	Jan	Flow (Totalized Est.)	0.002717	0.004887	MGD							4	Daily		
03A160	TA35-294, 301	2015	Feb	Flow (Totalized Est.)	0.003296	0.004563	MGD							8	Daily		
03A160	TA35-294, 301	2015	Mar	Flow (Totalized Est.)	0.003748	0.004232	MGD							9	Daily		
03A160	TA35-294, 301	2015	Apr	Flow (Totalized Est.)	0.003359	0.005055	MGD							10	Daily		
03A160	TA35-294, 301	2015	May	Flow (Totalized Est.)	0.003075	0.004322	MGD							8	Daily		
03A160	TA35-294, 301	2015	Jun	Flow (Totalized Est.)	0.003969	0.005903	MGD							8	Daily		
03A160	TA35-294, 301	2015	Jul	Flow (Totalized Est.)	0.003288	0.004179	MGD							8	Daily		
03A160	TA35-294, 301	2015	Aug	Flow (Totalized Est.)	0.003470	0.004070	MGD							9	Daily		
03A160	TA35-294, 301	2015	Sept	Flow (Totalized Est.)	0.003444	0.003832	MGD							6	Daily		
03A160	TA35-294, 301	2015	Oct	Flow (Totalized Est.)	0.003007	0.003750	MGD							8	Daily		
03A160	TA35-294, 301	2015	Nov	Flow (Totalized Est.)	0.002903	0.004183	MGD							7	Daily		
03A160	TA35-294, 301	2015	Dec	Flow (Totalized Est.)	0.003566	0.004818	MGD							7	Daily		
03A160	TA35-294, 301	2016	Jan	Flow (Totalized Est.)	0.003021	0.005100	MGD							7	Daily		
03A160	TA35-294, 301	2016	Feb	Flow (Totalized Est.)	0.003769	0.004929	MGD							8	Daily		
03A160	TA35-294, 301	2016	Mar	Flow (Totalized Est.)	0.003265	0.004341	MGD							9	Daily		
03A160	TA35-294, 301	2016	Apr	Flow (Totalized Est.)	0.003275	0.004297	MGD							6	Daily		
03A160	TA35-294, 301	2016	May	Flow (Totalized Est.)	0.003390	0.004465	MGD							6	Daily		
03A160	TA35-294, 301	2016	Jun	Flow (Totalized Est.)	0.002995	0.003697	MGD							5	Daily		
03A160	TA35-294, 301	2016	Jul	Flow (Totalized Est.)	0.003355	0.004504	MGD							7	Daily		
03A160	TA35-294, 301	2016	Aug	Flow (Totalized Est.)	0.002759	0.004107	MGD							8	Daily		
03A160	TA35-294, 301	2016	Sept	Flow (Totalized Est.)	0.003092	0.003568	MGD							7	Daily		
03A160	TA35-294, 301	2016	Oct	Flow (Totalized Est.)	0.002948	0.003823	MGD							7	Daily		
03A160	TA35-294, 301	2016	Nov	Flow (Totalized Est.)	0.002321	0.003130	MGD							7	Daily		
03A160	TA35-294, 301	2016	Dec	Flow (Totalized Est.)	0.002873	0.003495	MGD							5	Daily		
03A160	TA35-294, 301	2017	Jan	Flow (Totalized Est.)	0.001912	0.003059	MGD							6	Daily		
03A160	TA35-294, 301	2017	Feb	Flow (Totalized Est.)	0.002145	0.002695	MGD							5	Daily		
03A160	TA35-294, 301	2017	Mar	Flow (Totalized Est.)	0.003485	0.004430	MGD							4	Daily		
03A160	TA35-294, 301	2017	Apr	Flow (Totalized Est.)	0.002270	0.003204	MGD							3	Daily		
03A160	TA35-294, 301	2017	May	Flow (Totalized Est.)	0.003379	0.004068	MGD							6	Daily		
03A160	TA35-294, 301	2017	Jun	Flow (Totalized Est.)	0.003479	0.004919	MGD							6	Daily		
03A160	TA35-294, 301	2017	Jul	Flow (Totalized Est.)	0.002990	0.004493	MGD							8	Daily		
03A160	TA35-294, 301	2017	Aug	Flow (Totalized Est.)	0.003338	0.004810	MGD							8	Daily		
03A160	TA35-294, 301	2017	Sept	Flow (Totalized Est.)	0.004040	0.004573	MGD							6	Daily		
03A160	TA35-294, 301	2017	Oct	Flow (Totalized Est.)	0.003451	0.006470	MGD							6	Daily		
03A160	TA35-294, 301	2017	Nov	Flow (Totalized Est.)	0.003993	0.005058	MGD							6	Daily		
03A160	TA35-294, 301	2017	Dec	Flow (Totalized Est.)	0.003798	0.004770	MGD							5	Daily		



					Quantity or Loading										
OUTFALL			Monitoring		- Caramero, o									Number of	
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency
03A160	TA35-294, 301	2018	Jan	Flow (Totalized Est.)	0.002928	0.003960	MGD							8	Daily
03A160	TA35-294, 301	2018	Feb	Flow (Totalized Est.)	0.001289	0.001600	MGD							13	Daily
03A160	TA35-294, 301	2018	Mar	Flow (Totalized Est.)	0.001243	0.001484	MGD							11	Daily
03A160	TA35-294, 301	2018	Apr	Flow (Totalized Est.)	0.001039	0.001335	MGD							8	Daily
03A160	TA35-294, 301	2018	May	Flow (Totalized Est.)	0.000873	0.001139	MGD							2	Daily
03A160	TA35-294, 301	2018	Jun	Flow (Totalized Est.)	0.000000	0.000000	MGD							0	Daily
03A160	TA35-294, 301	2018	Jul	Flow (Totalized Est.)	0.000000	0.000000	MGD							0	Daily
03A160	TA35-294, 301	2018	Aug	Flow (Totalized Est.)	0.000000	0.000000	MGD							0	Daily
03A160	TA35-294, 301	2018	Sept	Flow (Totalized Est.)	0.000000	0.000000	MGD							0	Daily
				Flow (Totalized Est.)		Daily	/ Average							308	
				Flow (Totalized Est.)	Max	imum 30 Day	/ Average		0.0040					308	
				Flow (Totalized Est.)		N	Maximum			0.0065				308	
03A160	TA35-294, 301	2014	Oct	pН				7.9	****	8.6	S.U.	6.0 - 9.0	S.U.	6.0	Weekly
03A160	TA35-294, 301	2014	Nov	рН				8.4	****	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2014	Dec	рН				8.5	***	8.8	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2015	Jan	рН				8.6	***	8.8	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2015	Feb	рН				8.4	***	8.7	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2015	Mar	рН				8.4	***	8.7	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A160	TA35-294, 301	2015	Apr	рН				8.2	***	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2015	May	рН				8.2	***	8.4	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2015	Jun	рН				8.3	***	8.5	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A160	TA35-294, 301	2015	Jul	рН				8.4	***	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2015	Aug	рН				8.3	***	8.5	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A160	TA35-294, 301	2015	Sept	рН				8.3	***	8.5	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2015	Oct	рН				8.3	***	8.5	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2015	Nov	рН				7.4	***	8.4	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2015	Dec	рН				7.6	***	8.0	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2016	Jan	рН				8.0	***	8.3	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2016	Feb	рН				8.2	***	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2016	Mar	рН				8.5	***	8.7	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A160	TA35-294, 301	2016	Apr	рН				8.5	***	8.7	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2016	May	рН				8.4	***	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2016	Jun	рН				8.5	****	8.7	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A160	TA35-294, 301	2016	Jul	рН				8.3	****	8.5	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2016	Aug	pH				8.5	****	8.7	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A160	TA35-294, 301	2016	Sept	рН				8.5	****	8.5	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2016	Oct	рН				8.4	****	8.7	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2016	Nov	рН				8.4	****	8.6	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A160	TA35-294, 301	2016	Dec	pН				8.5	****	8.7	S.U.	6.0 - 9.0	S.U.	3.0	Weekly
03A160	TA35-294, 301	2017	Jan	pН				8.2	****	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2017	Feb	рН				8.5	****	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly



					Quantity o	ity or Loading Quality or Concentration									
OUTFALL			Monitoring		Quantity 5			Quality or s						Number of	
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency
03A160	TA35-294, 301	2017	Mar	рН				7.6	****	8.4	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2017	Apr	рН				7.8	****	8.1	S.U.	6.0 - 9.0	S.U.	3.0	Weekly
03A160	TA35-294, 301	2017	May	рН				8.1	****	8.3	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2017	Jun	рН				8.4	***	8.5	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A160	TA35-294, 301	2017	Jul	рН				8.5	***	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2017	Aug	рН				7.6	****	8.5	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A160	TA35-294, 301	2017	Sept	рН				8.3	****	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2017	Oct	рН				8.3	****	8.7	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A160	TA35-294, 301	2017	Nov	рН				8.5	****	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2017	Dec	рН				8.2	****	8.6	S.U.	6.0 - 9.0	S.U.	3.0	Weekly
03A160	TA35-294, 301	2018	Jan	рН				7.4	****	8.5	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A160	TA35-294, 301	2018	Feb	рН				7.2	****	8.0	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2018	Mar	рН				7.1	****	8.2	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2018	Apr	рН				7.0	***	8.4	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A160	TA35-294, 301	2018	May	рН				7.5	***	7.5	S.U.	6.0 - 9.0	S.U.	1.0	Weekly
03A160	TA35-294, 301	2018	Jun	рН				****	***	****	S.U.	6.0 - 9.0	S.U.	0.0	Weekly
03A160	TA35-294, 301	2018	Jul	рН				****	***	****	S.U.	6.0 - 9.0	S.U.	0.0	Weekly
03A160	TA35-294, 301	2018	Aug	рН				****	****	****	S.U.	6.0 - 9.0	S.U.	0.0	Weekly
03A160	TA35-294, 301	2018	Sept	рН				***	****	****	S.U.	6.0 - 9.0	S.U.	0.0	Weekly
				рН		ı	Minimum	7.0						183	
				рН	Max	imum 30 Day	Average		8.7					183	
				рН		N	/laximum			8.8				183	
03A160	TA35-294, 301		Oct	Total Residual Chlorine				***	***	0	mg/L	0.011	mg/L	6	Weekly
03A160	TA35-294, 301	2014	Nov	Total Residual Chlorine				***	***	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	2014	Dec	Total Residual Chlorine				***	***	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	2015	Jan	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	2015	Feb	Total Residual Chlorine				***	***	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	2015	Mar	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	5	Weekly
03A160	TA35-294, 301		Apr	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	2015	May	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	2015	Jun	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5	Weekly
03A160	TA35-294, 301	2015	Jul	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5	Weekly
03A160	TA35-294, 301		Sept	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301		Oct	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	2015	Nov	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301			Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	2016	Jan	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301		Feb	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	+	Mar	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5	Weekly
03A160	TA35-294, 301	2016	Apr	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	4	Weekly



					Quantity o	r Loading		Quality or C	Concentration						
OUTFALL			Monitoring											Number of	
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency
03A160	TA35-294, 301	2016	May	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	2016	Jun	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5	Weekly
03A160	TA35-294, 301	2016	Jul	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	2016	Aug	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5	Weekly
03A160	TA35-294, 301	2016	Sept	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	2016	Oct	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	2016	Nov	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5	Weekly
03A160	TA35-294, 301	2016	Dec	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	3	Weekly
03A160	TA35-294, 301	2017	Jan	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	2017	Feb	Total Residual Chlorine				***	***	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	2017	Mar	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	2017	Apr	Total Residual Chlorine				***	***	0	mg/L	0.011	mg/L	3	Weekly
03A160	TA35-294, 301	2017	May	Total Residual Chlorine				***	***	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	2017	Jun	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5	Weekly
03A160	TA35-294, 301	2017	Jul	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	2017	Aug	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5	Weekly
03A160	TA35-294, 301	2017	Sept	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	2017	Oct	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5	Weekly
03A160	TA35-294, 301	2017	Nov	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	2017	Dec	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	3	Weekly
03A160	TA35-294, 301	2018	Jan	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	5	Weekly
03A160	TA35-294, 301	2018	Feb	Total Residual Chlorine				***	***	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	2018	Mar	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	2018	Apr	Total Residual Chlorine				***	***	0	mg/L	0.011	mg/L	4	Weekly
03A160	TA35-294, 301	2018	May	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	1	Weekly
03A160	TA35-294, 301	2018	Jun	Total Residual Chlorine				***	****	****	mg/L	0.011	mg/L	0	Weekly
03A160	TA35-294, 301	2018	Jul	Total Residual Chlorine				***	****	****	mg/L	0.011	mg/L	0	Weekly
03A160	TA35-294, 301	2018		Total Residual Chlorine				***	****	****	mg/L	0.011	mg/L	0	Weekly
03A160	TA35-294, 301	2018	Sept	Total Residual Chlorine				***	****	****	mg/L	0.011	mg/L	0	Weekly
			·	Total Residual Chlorine		Daily	Average		0.000					48	
				Total Residual Chlorine	Max	cimum 30 Day			0.000					48	
				Total Residual Chlorine			laximum			0.000				48	
03A160	TA35-294, 301	2014	Oct	Cyanide, Total				***	2.9	2.9	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2014	Nov	Cyanide, Total				***	3.4	3.4	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2014	Dec	Cyanide, Total				***	0.0	0.0	mg/L	NA	NA	2	Weekly
03A160	TA35-294, 301	2015	Jan	Cyanide, Total				***	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2015		Cyanide, Total				***	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2015	Mar	Cyanide, Total				***	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2015		Cyanide, Total				***	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2015	•	Cyanide, Total				***	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2015	•	Cyanide, Total				****	0.0	0.0	mg/L	NA	NA	1	Weekly



	Quantity or Loading Quality or Concentration							Quality or C	Concentration	1					
OUTFALL			Monitoring		-									Number of	
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency
03A160	TA35-294, 301	2015	Jul	Cyanide, Total				***	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2015	Aug	Cyanide, Total				****	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2015	Sept	Cyanide, Total				****	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2015	Oct	Cyanide, Total				****	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2015	Nov	Cyanide, Total				****	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2015	Dec	Cyanide, Total				****	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2016	Jan	Cyanide, Total				****	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2016	Feb	Cyanide, Total				****	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2016	Mar	Cyanide, Total				****	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2016	Apr	Cyanide, Total				****	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2016	May	Cyanide, Total				****	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2016	Jun	Cyanide, Total				****	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2016	Jul	Cyanide, Total				****	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2016	Aug	Cyanide, Total				***	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2016	Sept	Cyanide, Total				***	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2016	Oct	Cyanide, Total				***	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2016	Nov	Cyanide, Total				****	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2016	Dec	Cyanide, Total				***	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2017	Jan	Cyanide, Total				***	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2017	Feb	Cyanide, Total				***	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2017	Mar	Cyanide, Total				***	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2017	Apr	Cyanide, Total				***	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2017	May	Cyanide, Total				****	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2017	Jun	Cyanide, Total				****	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2017	Jul	Cyanide, Total				****	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2017	Aug	Cyanide, Total				****	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2017		Cyanide, Total				****	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2017	Oct	Cyanide, Total				****	<11.7	21.8	mg/L	NA	NA	2	Weekly
03A160	TA35-294, 301	2017	Nov	Cyanide, Total				***	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2017	Dec	Cyanide, Total				***	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160							***	0.0	0.0	mg/L	NA	NA	1	Weekly	
03A160						***	0.0	0.0	mg/L	NA	NA	1	Weekly		
03A160	TA35-294, 301	2018		Cyanide, Total				***	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2018		Cyanide, Total				***	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2018	•	Cyanide, Total				***	0.0	0.0	mg/L	NA	NA	1	Weekly
03A160	TA35-294, 301	2018	•	Cyanide, Total				***	***	****	mg/L	NA	NA	0	Weekly
03A160	TA35-294, 301	2018	<u> </u>	Cyanide, Total				***	***	****	mg/L	NA	NA	0	Weekly
03A160	TA35-294, 301	2018	Aug	Cyanide, Total				***	***	***	mg/L	NA	NA	0	Weekly
03A160	TA35-294, 301	2018		Cyanide, Total				***	***	***	mg/L	NA	NA	0	Weekly
		•		Cyanide, Total		Daily	Average		0.6					46	
				Cyanide, Total	Max	imum 30 Day			3.4					46	



					Quantity or Loading Quality or Concentration										
OUTFALL			Monitoring											Number of	
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency
	<u>, </u>			Cyanide, Total		N	Maximum			21.8				46	
03A160	TA35-294, 301	2014	Oct	Copper, Total				****	<0.00207	0.006665	mg/L	0.021 - 0.032	mg/L	9	Weekly
03A160	TA35-294, 301	2014	Nov	Copper, Total				****	0.002	0.00364	mg/L	0.021 - 0.032	mg/L	7	Weekly
03A160	TA35-294, 301	2014	Dec	Copper, Total				****	0.00133	0.00173	mg/L	0.021 - 0.032	mg/L	7	Weekly
03A160	TA35-294, 301	2015	Jan	Copper, Total				****	0.000935	0.00138	mg/L	0.021 - 0.032	mg/L	7	Weekly
03A160	TA35-294, 301	2015	Feb	Copper, Total				****	0.000655	0.000832	mg/L	0.021 - 0.032	mg/L	8	Weekly
03A160	TA35-294, 301	2015	Mar	Copper, Total				****	<0.000635	0.000858	mg/L	0.021 - 0.032	mg/L	9	Weekly
03A160	TA35-294, 301	2015	Apr	Copper, Total				***	< 0.000563	0.000735	mg/L	0.021 - 0.032	mg/L	10	Weekly
03A160	TA35-294, 301	2015	May	Copper, Total				****	<0.000522	0.000964	mg/L	0.021 - 0.032	mg/L	8	Weekly
03A160	TA35-294, 301	2015	Jun	Copper, Total				****	<0.000571	0.00115	mg/L	0.021 - 0.032	mg/L	8	Weekly
03A160	TA35-294, 301	2015	Jul	Copper, Total				****	<0.00054	0.000972	mg/L	0.021 - 0.032	mg/L	8	Weekly
03A160	TA35-294, 301	2015	Aug	Copper, Total				****	<0.000498	0.000681	mg/L	0.021 - 0.032	mg/L	9	Weekly
03A160	TA35-294, 301	2015	Sept	Copper, Total				****	0.000753	0.00163	mg/L	0.021 - 0.032	mg/L	6	3/Week
03A160	TA35-294, 301	2015	Oct	Copper, Total				****	<0.000628	0.000812	mg/L	0.021 - 0.032	mg/L	8	Weekly
03A160	TA35-294, 301	2015	Nov	Copper, Total				****	<0.00106	0.00378	mg/L	0.021 - 0.032	mg/L	7	Weekly
03A160	TA35-294, 301	2015	Dec	Copper, Total				****	0.000538	0.000742	mg/L	0.021 - 0.032	mg/L	7	Weekly
03A160	TA35-294, 301	2016	Jan	Copper, Total				****	0.000619	0.000784	mg/L	0.021 - 0.032	mg/L	7	Weekly
03A160	TA35-294, 301	2016	Feb	Copper, Total				****	0.000995	0.002	mg/L	0.021 - 0.032	mg/L	8	Weekly
03A160	TA35-294, 301	2016	Mar	Copper, Total				****	0.000784	0.00107	mg/L	0.021 - 0.032	mg/L	9	Weekly
03A160	TA35-294, 301	2016	Apr	Copper, Total				****	0.000584	0.000802	mg/L	0.021 - 0.032	mg/L	6	Weekly
03A160	TA35-294, 301	2016	May	Copper, Total				****	0.000803	0.00126	mg/L	0.021 - 0.032	mg/L	6	Weekly
03A160	TA35-294, 301	2016	Jun	Copper, Total				****	0.00101	0.00153	mg/L	0.021 - 0.032	mg/L	5	Weekly
03A160	TA35-294, 301	2016	Jul	Copper, Total				****	0.001647	0.00316	mg/L	0.021 - 0.032	mg/L	7	Weekly
03A160	TA35-294, 301	2016	Aug	Copper, Total				****	0.00252	0.00341	mg/L	0.021 - 0.032	mg/L	8	Weekly
03A160	TA35-294, 301	2016	Sept	Copper, Total				****	0.00155	0.00202	mg/L	0.021 - 0.032	mg/L	7	Weekly
03A160	TA35-294, 301	2016	Oct	Copper, Total				****	0.00076	0.00128	mg/L	0.021 - 0.032	mg/L	7	Weekly
03A160	TA35-294, 301	2016	Nov	Copper, Total				****	0.00106	0.00144	mg/L	0.021 - 0.032	mg/L	7	Weekly
03A160	TA35-294, 301	2016	Dec	Copper, Total				****	0.00074	0.000865	mg/L	0.021 - 0.032	mg/L	5	Weekly
03A160	TA35-294, 301	2017	Jan	Copper, Total				****	0.000856	0.00123	mg/L	0.021 - 0.032	mg/L	6	Weekly
03A160	TA35-294, 301	2017	Feb	Copper, Total				***	0.000499	0.000569	mg/L	0.021 - 0.032	mg/L	5	Weekly
03A160	TA35-294, 301	2017	Mar	Copper, Total				***	0.00382	0.00748	mg/L	0.021 - 0.032	mg/L	4	Weekly
03A160	TA35-294, 301	2017	Apr	Copper, Total				***	<0.000449	0.000591	mg/L	0.021 - 0.032	mg/L	3	Weekly
03A160	TA35-294, 301	2017	-	Copper, Total				***	0.000472	0.000692	mg/L	0.021 - 0.032	mg/L	6	Weekly
03A160	TA35-294, 301	2017	· ·	Copper, Total				***	0.00161	0.00224	mg/L	0.021 - 0.032	mg/L	6	Weekly
03A160	TA35-294, 301	2017		Copper, Total				***	0.00182	0.0022	mg/L	0.021 - 0.032	mg/L	8	Weekly
03A160	TA35-294, 301	2017		Copper, Total				***	0.000884	0.00137	mg/L	0.021 - 0.032	mg/L	8	Weekly
03A160	TA35-294, 301	2017	_	Copper, Total				***	0.00163	0.00184	mg/L	0.021 - 0.032	mg/L	4	Weekly
03A160	TA35-294, 301	2017		Copper, Total				***	0.001592	0.00221	mg/L	0.021 - 0.032	mg/L	6	Weekly
03A160	TA35-294, 301	2017		Copper, Total				***	0.0012	0.0017	mg/L	0.021 - 0.032	mg/L	6	Weekly
03A160	TA35-294, 301	2017	Dec	Copper, Total				***	0.000762	0.00105	mg/L	0.021 - 0.032	mg/L	5	Weekly
03A160	TA35-294, 301	2018	Jan	Copper, Total				****	0.00114	0.00155	mg/L	0.021 - 0.032	mg/L	8	Weekly



					Quantity or Loading Quality or Concentration										
OUTFALL			Monitoring											Number of	
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency
03A160	TA35-294, 301	2018	Feb	Copper, Total				****	<0.00145	0.00165	mg/L	0.021 - 0.032	mg/L	11	Weekly
03A160	TA35-294, 301	2018	Mar	Copper, Total				****	0.00124	0.00147	mg/L	0.021 - 0.032	mg/L	10	Weekly
03A160	TA35-294, 301	2018	Apr	Copper, Total				****	<0.00154	0.00308	mg/L	0.021 - 0.032	mg/L	8	Weekly
03A160	TA35-294, 301	2018	May	Copper, Total				****	0.00182	0.00194	mg/L	0.021 - 0.032	mg/L	2	Weekly
03A160	TA35-294, 301	2018	Jun	Copper, Total				****	****	****	mg/L	0.021 - 0.032	mg/L	0	Weekly
03A160	TA35-294, 301	2018	Jul	Copper, Total				****	****	****	mg/L	0.021 - 0.032	mg/L	0	Weekly
03A160	TA35-294, 301	2018	Aug	Copper, Total				****	***	****	mg/L	0.021 - 0.032	mg/L	0	Weekly
03A160	TA35-294, 301	2018	Sept	Copper, Total				****	***	****	mg/L	0.021 - 0.032	mg/L	0	Weekly
				Copper, Total		Daily	Average		0.00121		-			306	
				Copper, Total	Max	imum 30 Day	/ Average		0.00382					306	
				Copper, Total		N	/laximum			0.00748				306	
03A160	TA35-294, 301	2014	Dec	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly
03A160	TA35-294, 301	2015	Mar	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly
03A160	TA35-294, 301	2015	Jun	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly
03A160	TA35-294, 301	2015	Sept	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly
03A160	TA35-294, 301	2015	Dec	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly
03A160	TA35-294, 301	2016	Mar	Total Suspended Solids				****	0.8	0.8	mg/L	30 - 100	mg/L	1	Quarterly
03A160	TA35-294, 301	2016	Jun	Total Suspended Solids				****	1.4	1.4	mg/L	30 - 100	mg/L	1	Quarterly
03A160	TA35-294, 301	2016	Sept	Total Suspended Solids				****	<5.7	<5.7	mg/L	30 - 100	mg/L	1	Quarterly
03A160	TA35-294, 301	2016	Dec	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly
03A160	TA35-294, 301	2017	Mar	Total Suspended Solids				****	<0.6	<0.6	mg/L	30 - 100	mg/L	1	Quarterly
03A160	TA35-294, 301	2017	Jun	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly
03A160	TA35-294, 301	2017	Sept	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly
03A160	TA35-294, 301	2017	Dec	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly
03A160	TA35-294, 301	2018	Mar	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly
03A160	TA35-294, 301	2018	Jun	Total Suspended Solids				****	***	****	mg/L	30 - 100	mg/L	0	Quarterly
03A160	TA35-294, 301	2018	Sept	Total Suspended Solids				****	****	****	mg/L	30 - 100	mg/L	0	Quarterly
				Total Suspended Solids		Daily	Average		1.1					14	
				Total Suspended Solids	Max	imum 30 Day	Average		1.4					14	
				Total Suspended Solids		N	/laximum			1.4				14	
03A160	TA35-294, 301	2014	Dec	Phosphorus, Total				****	0.072	0.072	mg/L	20 - 40	mg/L	1	Quarterly
03A160	TA35-294, 301	2015	Mar	Phosphorus, Total				****	0.0865	0.0865	mg/L	20 - 40	mg/L	1	Quarterly
03A160	TA35-294, 301	2015	Jun	Phosphorus, Total				****	0.0741	0.0741	mg/L	20 - 40	mg/L	1	Quarterly
03A160	TA35-294, 301	2015	Sept	Phosphorus, Total				****	0.057	0.057	mg/L	20 - 40	mg/L	1	Quarterly
03A160	TA35-294, 301	2015	Dec	Phosphorus, Total				****	<0.068	<0.068	mg/L	20 - 40	mg/L	1	Quarterly
03A160	TA35-294, 301	2016	Mar	Phosphorus, Total				****	0.0429	0.0429	mg/L	20 - 40	mg/L	1	Quarterly
03A160	TA35-294, 301	2016	Jun	Phosphorus, Total				****	0.0414	0.0414	mg/L	20 - 40	mg/L	1	Quarterly
03A160	TA35-294, 301	2016	Sept	Phosphorus, Total				****	0.0894	0.0894	mg/L	20 - 40	mg/L	1	Quarterly
03A160	TA35-294, 301	2016	Dec	Phosphorus, Total				****	0.0938	0.0938	mg/L	20 - 40	mg/L	1	Quarterly
03A160	TA35-294, 301	2017	Mar	Phosphorus, Total				****	0.0451	0.0451	mg/L	20 - 40	mg/L	1	Quarterly
03A160	TA35-294, 301	2017	Jun	Phosphorus, Total				***	0.0631	0.0631	mg/L	20 - 40	mg/L	1	Quarterly



					Quantity o	r Loading		Quality or C	Concentration						
OUTFALL			Monitoring											Number of	
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency
03A160	TA35-294, 301	2017	Sept	Phosphorus, Total				****	3.1	3.1	mg/L	20 - 40	mg/L	1	Quarterly
03A160	TA35-294, 301	2017	Dec	Phosphorus, Total				****	0.366	0.366	mg/L	20 - 40	mg/L	1	Quarterly
03A160	TA35-294, 301	2018	Mar	Phosphorus, Total				****	0.0928	0.0928	mg/L	20 - 40	mg/L	1	Quarterly
03A160	TA35-294, 301	2018	Jun	Phosphorus, Total				****	****	***	mg/L	20 - 40	mg/L	0	Quarterly
03A160	TA35-294, 301	2018	Sept	Phosphorus, Total				****	****	***	mg/L	20 - 40	mg/L	0	Quarterly
				Phosphorus, Total		Daily	/ Average		0.325					14	
				Phosphorus, Total	Max	imum 30 Day	/ Average		3.100					14	
				Phosphorus, Total		N	/laximum			3.100				14	
03A160	TA35-294, 301	2015	Sept	Arsenic, Total				****	0.00174	0.00174	mg/L	0.013 - 0.018	mg/L	1	Yearly
03A160	TA35-294, 301	2016	Sept	Arsenic, Total				****	0.00242	0.00242	mg/L	0.013 - 0.018	mg/L	1	Yearly
03A160	TA35-294, 301	2017	Sept	Arsenic, Total				****	0.00259	0.00259	mg/L	0.013 - 0.018	mg/L	1	Yearly
03A160	TA35-294, 301	2018	Sept	Arsenic, Total				****	****	****	mg/L	0.013 - 0.018	mg/L	1	Yearly
						Daily	/ Average		0.00225					4	
					Max	imum 30 Day	/ Average		0.00259					4	
						N	/laximum			0.00259				4	
03A160	TA35-294, 301	2015	Sept	Aluminum, Total				***	****	<0.015	mg/L	NA	NA	1	Yearly
03A160	TA35-294, 301	2016	Sept	Aluminum, Total				***	****	<0.015	mg/L	NA	NA	1	Yearly
03A160	TA35-294, 301	2017	Sept	Aluminum, Total				***	****	<0.0193	mg/L	NA	NA	1	Yearly
03A160	TA35-294, 301	2018	Sept	Aluminum, Total				***	****	****	mg/L	NA	NA	1	Yearly
						Daily	/ Average		0.00000					4	
					Max	imum 30 Day	/ Average		0.00000					4	
						N	/laximum			0.00000				4	
03A160	TA35-294, 301	2015	Sept	Chromium VI				***	0.0087	0.0087	mg/L	NA	NA	1	Term
03A160	TA35-294, 301	2016	Sept	Chromium VI				****	****	****	mg/L	NA	NA	0	Term
03A160	TA35-294, 301	2017	Sept	Chromium VI				****	****	****	mg/L	NA	NA	0	Term
03A160	TA35-294, 301	2018	Sept	Chromium VI				****	****	****	mg/L	NA	NA	0	Term
						Daily	/ Average		0.00000					1	
					Max	imum 30 Day	/ Average		0.00000					1	
						N	/laximum			0.00000				1	
03A160	TA35-294, 301	2015	Sept	Gross Alpha				****	****	****	pCi/L	NA	NA	0	Term
03A160	TA35-294, 301	2016	Sept	Gross Alpha				****	0	0	pCi/L	NA	NA	1	Term
03A160	TA35-294, 301	2017	Sept	Gross Alpha				****	****	****	pCi/L	NA	NA	0	Term
03A160	TA35-294, 301	2018		Gross Alpha				****	****	****	pCi/L	NA	NA	0	Term
					Daily Average			0.00000					1		
					Max	imum 30 Day	/ Average		0.00000					1	
						_	/laximum			0.00000				1	



ATTACHMENT E: Safety Data Sheets

LIST OF SAFETY DATA SHEETS
GC Formula 315
GC Formula 314-T
GC Formula 2010-LT
Vita-D-Chlor Tablets
Bright Dyes FLT Yellow/Green Liquid
Bright Dyes FLT Yellow/Green Tablet



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GC FORMULA 315





MATERIAL SAFETY DATA SHEET

SECTION | - PRODUCT IDENTIFICATION

PRODUCT NAME: FORMULA 315
PRODUCT USE: BIOCIDE

RESTRICTIONS ON USE: Refer to label, available technical information, and other appropriate

sections of this SDS.

UN NUMBER: 3265

PROPER SHIPPING NAME: CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (5-CHLORO-2-

METHYL-4-ISOTHIAZOLIN-3-ONE), 8, PG II

MANUFACTURER'S NAME: Garratt-Callahan Company

ADDRESS: 50 Ingold Road, Burlingame, CA 94010-2206

EMERGENCY PHONE: North America: CHEMTREC: 1-800-424-9300
Outside North America: +1-703-527-3887

Outside North America: +1-/03-52/-388

BUSINESS PHONE: Product Information: 650-697-5811

MSDS NUMBER: SD3315
DATE OF REVISION: 5/21/2013

SECTION 2 - HAZARDS IDENTIFICATION

GHS LABELING AND CLASSIFICATION:

SIGNAL WORD: WARNING

GHS HAZARD STATEMENT

H302: Harmful if swallowed.

H315: Causes skin irritation.

H320: Causes eye irritation.

H335: May cause respiratory irritation.

GHS PREVENTATIVE STATEMENTS:

P101: If medical advice is needed, have product container or label at hand.

P102: Keep out of reach of children.

P103: Read label before use.

P261: Avoid breathing dust/fume/gas/mist/vapours/spray.

P264: Wash all exposed skin/hair thoroughly after handling.

P270: Do not eat, drink or smoke when using this product.

P271: Use only outdoors or in a well-ventilated area.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

DANGER! THIS PRODUCT IS A NON-FLAMMABLE, CLEAR YELLOW GREEN LIQUID WITH A PUNGENT ODOR. MAY CAUSE EYE AND SKIN BURNS. HARMFUL IF SWALLOWED. MAY CAUSE RESPIRATORY TRACT IRRITATION. ENVIRONMENTAL HAZARDS: Release of this product to the environment is expected to cause harm to plants and animals. If accidentally released, precautions must be taken to protect the environment.

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE: The most significant routes of overexposure for this product are by inhalation of mists or contact with skin or eyes. The symptoms of overexposure are described in the following paragraphs.

HEALTH EFFECTS AND RISKS FROM EXPOSURE:

ACUTE: Contact with skin and eyes will cause burning and irritation. Do not wear contact lenses when using this product. Ingestion will cause gastric distress and possible depression of the central nervous system.

CHRONIC: Repeated or prolonged exposure to this product can produce target organ damage. Repeated exposure of the eyes can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation can produce varying degrees of respiratory irritation or lung damage.

TARGET ORGANS:

ACUTE: Skin, eyes, respiratory, gastrointestinal systems.

CHRONIC: Skin, eyes, respiratory, gastrointestinal systems.

WATER TREATMENT EXPERTISE SINCE 1904

FORMULA 315

www.g-c.com

Page 1 of 5

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



HAZARDOUS MATERIAL IDENTIFICATION SYSTEM



Hazard Scale 0=Minimal I=Slight 2=Moderate 3=Serious 4=Severe *=Chronic hazard



ATION ON INGRED	IENTS			
CAS#	EC#	ICSC#	WT %	
10377-60-3	233-826-7	1041	1-3	
26172-55-4	247-500-7	NA	1-2	
2682-20-4	220-239-6	NA	<	
7786-30-3	232-094-6	0764	<	- 6
	CAS# 10377-60-3 26172-55-4 2682-20-4	10377-60-3 233-826-7 26172-55-4 247-500-7 2682-20-4 220-239-6	CAS# EC# ICSC# 10377-60-3 233-826-7 1041 26172-55-4 247-500-7 NA 2682-20-4 220-239-6 NA	CAS# EC# ICSC# WT % 10377-60-3 233-826-7 1041 1-3 26172-55-4 247-500-7 NA 1-2 2682-20-4 220-239-6 NA < 1

SECTION 4 - FIRST AID MEASURES

P312: Call a POISON CENTER or doctor/physician if you feel unwell. Contaminated individuals of chemical exposure must be taken for medical attention if any adverse effect occurs. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to health professional with contaminated individual.

SKIN EXPOSURE: P302+P352; IF ON SKIN: Wash with soap and water. Minimum flushing is for 15 minutes. Remove exposed or contaminated clothing, taking care not to contaminate eyes. The contaminated individual must seek medical attention if any adverse effect occurs. P362: Take off contaminated clothing and wash before reuse.

EYE EXPOSURE: P305+P35 I+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do continue rinsing. If vapors, mists, or sprays generated by this product enter the eyes, open contaminated individual's eyes while under gently running water. Use sufficient force to open eyelids. Have contaminated individual "roll" eyes. Minimum flushing is for 15 minutes. Contaminated individual must seek immediate medical attention. P337+P313: If eye irritation persists get medical advice/attention.

INHALATION: If vapors, mists, or sprays generated by this product are inhaled, remove contaminated individual to fresh air. If necessary, use artificial respiration to support vital functions. Remove or cover gross contamination to avoid exposure to rescuers. P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

INGESTION: P301+P312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. P330: Rinse mouth. Routine use of this product is not expected to cause any situation which could lead to ingestion.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Skin and respiratory disorders, as well as conditions involving the "Target Organs" (see Section 3, Hazard Identification) may be aggravated by prolonged overexposures to this product.

NOTES TO PHYSICIAN: Treat symptoms as demonstrated by signs and distress in the patient.

SECTION 5 - FIRE FIGHTING MEASURES

SUITABLE (AND UNSUITABLE) **EXTINGUISHING MATERIALS:**

Use media appropriate for the surrounding fire.

SPECIFIC HAZARDS ARISING FROM THE CHEMICAL:

Non-Flammable Liquid.

Explosion hazards in Presence of Various Substances: Non-Explosive in presence of open flames

and sparks, or shocks.

Special Remarks on Explosion Hazards: None known

SPECIAL PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIREFIGHTERS:

Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Isolate materials not yet involved in the fire and protect personnel. Move containers from fire area if this can be done without risk; otherwise, cool with carefully applied water spray. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

WATER TREATMENT EXPERTISE SINCE 1904

FORMULA 315 www.g-c.com Page 2 of 5

LA-UR-19-22215



SECTION 6 - ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by appropriately trained personnel using pre-planned procedures. Proper protective equipment should be used.

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Corrosive liquid.

Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas, dike if needed. Ensure that the product is not at a concentration level above regulated concentration. Decontaminate the area thoroughly. Decontaminate all response equipment with soapy water before returning to service. Place all spill residue in a suitable container and seal.

SECTION 7 - HANDLING AND STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat, drink, smoke, or apply cosmetics while handling this product. Avoid breathing vapors or mists generated by this product. Use in a well-ventilated location. Remove contaminated clothing immediately.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Open containers slowly on a stable surface. Containers of this product must be properly labeled. Storage areas of this product should be clearly identified, well-illuminated, clear of obstruction and accessible only to trained and authorized personnel. Store containers in a cool, dry location, away from direct sunlight, at temperatures between 50°F - 104°F. Keep container tightly closed when not in use. P405: Store locked up. P403+P233: Store in a well ventilated place. Keep container tightly closed.

SECTION 8 - EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation. Eyewash/safety shower station is recommended to be available near where this product is used/stored.

EXPOSURE LIMITS/GUIDELINES:

EXPOSURE LIMITS IN AIR

CHEMICAL NAME	CAS#	ACGII TWA	HTLV STEL	OSHA PEL TWA	<u>OTHER</u>
MAGNESIUM NITRATE	10377-60-3	NE	NE	NE	NE
5-CHLORO-2-METHYL-4- ISOTHIAZOLIN-3-ONE	26172-55-4	NE	NE	NE	NE
2-METHYL-4-ISOTHIAZOLIN-3- ONE	2682-20-4	NE	NE	NE	NE
MAGNESIUM CHLORIDE	7786-30-3	NE	NE	NE	NE

NE = Not Established

INGESTION: P270: Do not eat, drink or smoke when using this product.

RESPIRATORY PROTECTION: P261: Avoid breathing dust/fume/gas/mist/vapours/spray. P271: Use only outdoors or in a well-ventilated area. Maintain airborne contaminant concentrations below guidelines listed above, if applicable. Air-purifying

respirators with dust/mist/fume filters are recommended if operations may produce mists or sprays from this product.

EYE PROTECTION: Safety glasses or safety goggles. If splashing is anticipated, a face shield is recommended. P280: Wear protective gloves/protective clothing/eye protection/face protection.

SKIN PROTECTION: HAND PROTECTION: P264: Wash all exposed skin/hair thoroughly after handling. P280: Wear protective

gloves/protective clothing/eye protection/face protection. Use chemically-resistant gloves when handling this

product.

BODY PROTECTION: Use body protection appropriate for task (e.g., lab coat, overalls, gloves).

WATER TREATMENT EXPERTISE SINCE 1904 www.g-c.com

FORMULA 315

Page 3 of 5

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application Attachment E

E-6 of 37



SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE and COLOR:

Clear yellow/green liquid

VAPOR PRESSURE, mm Hg @ 20°C:

Not established

ODOR: ODOR THRESHOLD: Pungent Not established Not established

pH:

3.0 - 6.5

RELATIVE DENSITY@20°C (water=1):

1.0 - 1.10Complete

MELTING/FREEZING POINT:

NA

SOLUBILITY IN WATER:

VAPOR DENSITY (Air=1):

PARTITION COEFFICIENT(n-octanol/water) Not established

BOILING POINT:

100°C (212°F)

AUTOIGNITION TEMPERATURE:

NA

FLASHPOINT:

Non-flammable

DECOMPOSITION TEMPERATURE:

Not established

EVAPORATION RATE (n-BuAc=1): FLAMMABILITY (SOLID/GAS):

VISCOSITY: VOLATILE ORGANIC COMPOUNDS (%): Not established

Not established

FLAMMABLE LIMITS (in air by volume, %): NA

SECTION 10 - STABILITY AND REACTIVITY

REACTIVITY: Not established

STABILITY: Stable

POSSIBILITY OF

HAZARDOUS REACTIONS: Will not occur. CONDITIONS TO AVOID: None known.

INCOMPATIBLE MATERIALS: Oxidizing agents, reducing agents, amines, mercaptans.

HAZARDOUS

DECOMPOSITION PRODUCTS: Thermal decomposition may yield the following: Hydrogen chloride, oxides of sulfur and nitrogen.

SECTION 11 - TOXICOLOGICAL INFORMATION

Ceriodaphnia dubia (waterflea): 48hr, LC50s: 8.77 ppm Ceriodaphnia dubia (waterflea): 96hr, LC50s: 7.88 ppm Pimephales promelas (fathead minnow): 48hr, LC50s: 9.84 ppm Pimephales promelas (fathead minnow): 96hr, LC50s: 9.56 ppm

SUSPECTED CANCER AGENT: The components of this product are not found on the following lists: FEDERAL OSHA Z LIST, NTP, IARC, or CAL/OSHA and therefore are not considered to be, nor suspected to be, cancer-causing agents by these agencies.

IRRITANCY OF PRODUCT: This product is very irritating to skin, eyes and respiratory system.

SENSITIZATION TO THE PRODUCT: This product may cause allergic skin reactions (e.g., rashes, welts) in sensitive individuals.

SECTION 12 - ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: The components of this product will slowly degrade under ambient environmental conditions to other organic compounds

ECOLOGICAL DATA:

No data available

Material is considered biodegradeable.

BIOLOGICAL EXPOSURE INDICES: Currently, Biological Exposure Indices (BEIs) have not been determined for the components of this product.

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL: P501: Dispose of contents/container in accordance with local/regional/national/international regulations.

SECTION 14 - TRANSPORTATION INFORMATION

PROPER SHIPPING NAME

DOT: UN3265, CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE), 8, PG II Emergency Response Guidebook, Guide No.: 153

Passenger Aircraft Qty: IL

Cargo Aircraft Qty: 30L

IMDG/IMO: UN3265, CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.

(5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE), 8, PG II

IATA/ICAO: UN3265, CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE), 8, PG II

WATER TREATMENT EXPERTISE SINCE 1904

FORMULA 315

Page 4 of 5





ENVIRONMENTAL HAZARDS

(i.e., MARINE POLLUTANT): No data available for this product.

TRANSPORT IN BULK (according to

annex II marpol 73/78 and the IBC code): Not applicable.

SPECIAL PRECAUTIONS FOR USER: None known.

PRODUCT REQUIRES CORROSIVE LABEL

SECTION 15 - REGULATORY INFORMATION

United States and International Regulations

United States Regulations: U.S. SARA REPORTING REQUIREMENTS: The components of this product are subject to the reporting as listed below, requirements of Sections 302, 304, and 313 of Title of the Superfund Amendments and Reauthorization Act:

CHEMICAL NAME

MAGNESIUM NITRATE

SARA 302 (40 CFR 355, Appendix A) - NO SARA 304 (40 CFR Table 302.4) - NO

SARA 313 (40 CFR 372.65) - YES

5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE SARA 302 (40 CFR 355, Appendix A) - NO SARA 304 (40 CFR Table 302.4) - NO

SARA 313 (40 CFR 372.65) - NO

2-METHYL-4-ISOTHIAZOLIN-3-ONE

SARA 302 (40 CFR 355, Appendix A) - NO SARA 304 (40 CFR Table 302.4) - NO

SARA 313 (40 CFR 372.65) - NO

MAGNESIUM CHLORIDE

SARA 302 (40 CFR 355, Appendix A) - NO SARA 304 (40 CFR Table 302.4) - NO

SARA 313 (40 CFR 372.65) - NO

U.S. Regulations

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for the components of this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs (4,540 kg) therefore applies, per 40 CFR 370.20. U.S. CERCLA REPORTABLE QUANTITY (RQ): Not Listed.

TSCA INVENTORY STATUS: The components of this product are listed on the TSCA Inventory.

SARA TITLE III Section 311/312 Hazard Category: Acute: YES; Chronic: NO; Fire: NO; Reactive: NO; Sudden Release of Pressure: NO

STATE REGULATIONS:

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No component of this product is on the Proposition 65 List.

International Regulations

CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: The components of this product are on the DSL Inventories or are exempt from listing. CANADIAN WHMIS CLASSIFICATION: Not classified.

SECTION 16 - OTHER INFORMATION

PREPARED BY:

GARRATT CALLAHAN

DATE OF REVISION:

5/21/2013

Supercedes: 6/8/2012

Formula 315 is EPA-registered; with EPA Reg. No. 8540-23. Refer to the approved label for details.

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purpose or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose.

WATER TREATMENT EXPERTISE SINCE 1904

FORMULA 315

www.g-c.com

Page 5 of 5



GC FORMULA 314-T



MATERIAL SAFETY DATA SHEET

SECTION I - PRODUCT IDENTIFICATION

PRODUCT NAME: FORMULA 314-T
PRODUCT USE: BIOCIDE
UN NUMBER: 1479

PROPER SHIPPING NAME: OXIDIZING SOLID, N.O.S., 5.1, PGII, (I-BROMO-3-CHLORO-5,5-

DIMETHYLHYDANTOIN)

MANUFACTURER'S NAME: Garratt-Callahan Company

ADDRESS: 50 Ingold Road, Burlingame, CA 94010-2206

EMERGENCY PHONE: North America: CHEMTREC: 1-800-424-9300
Outside North America: +1-703-527-3887

Outside North America: +1-703-327-38

BUSINESS PHONE: Product Information: 650-697-5811

MSDS NUMBER: SD3314
DATE OF REVISION: 3/6/2012

SECTION 2 - HAZARDS IDENTIFICATION

OXIDIZING SOLID, N.O.S. (I-BROMO-3-CHLORO-5,5-DIMETHYLHYDANTOIN), 5.1, PGII

EU LABELING AND CLASSIFICATION: This product meets the definition of the following hazard class as defined by the European Economic Community Guidelines.

EU CLASSIFICATION: [Xn] Harmful; [C] Corrosive

EU RISK PHRASES: R8: Contact with combustible material may cause fire; R31: Contact with acids liberates toxic gas; R34: Causes burns.

EU SAFETY PHRASES: S8: Keep container dry; S17: Keep away from combustible materials; S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice; S36: Wear suitable protective clothing; S37: Wear suitable gloves; S39: Wear eye/face protection; S41: In case of fire and/or explosion do not breath fumes; S45: In case of accident or if you feel unwell, seek medical advice immediately.

DANGER! THIS PRODUCT IS A NON-FLAMMABLE, WHITE TO OFF-WHITE TABLET WITH A FAINT HALOGEN ODOR. MAY CAUSE EYE AND SKIN BURNS. HARMFUL IF INGESTED OR SWALLOWED. MAY CAUSE RESPIRATORY TRACT IRRITATION.

HEALTH EFFECTS AND RISKS FROM EXPOSURE:

ACUTE: Contact with skin and eyes will cause burning and irritation. Do not wear contact lenses when using this product. Ingestion will cause gastric distress and possible depression of the central nervous system.

CHRONIC: Repeated or prolonged exposure to this product can produce target organ damage. Repeated exposure of the eyes can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation can produce varying degrees of respiratory irritation or lung damage.

TARGET ORGANS:

ACUTE: Skin, eyes respiratory system.

CHRONIC: Skin, respiratory system

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH HAZARD (BLUE)	3
FLAMMABILITY HAZARD (RED)	0
REACTIVITY HAZARD (YELLOW)	T

Hazard Scale
0=Minimal
1=Slight
2=Moderate
3=Serious
4=Severe
*=Chronic hazard





WATER TREATMENT EXPERTISE SINCE 1904

FORMULA 314-T

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Page 1 of 5



SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous IngredientsCAS#EC#ICSC#WT%GHS Hazard StatementI-BROMO-3-CHLORO-5,5-DIMETHYL-
HYDANTOIN16079-88-2240-230-0NE96%HAZARD CLASSIFICATION:
[Xn] HARMFUL, [C] CORROSIVE
RISK PHRASES: R8, R31, R34

SECTION 4 - FIRST AID MEASURES

Exposed individuals must be taken for medical attention if any adverse effect occurs. Take a copy of this MSDS to the health professional with the individual.

SKIN EXPOSURE: If this product contaminates the skin, begin decontamination with running water and soap. Minimum flushing time is for 15 minutes. Remove exposed or contaminated clothing, taking care not to contaminate the eyes. The exposed individual must seek medical attention if any adverse effect occurs.

EYE EXPOSURE: If vapors, mists, or sprays are generated by this product and enter the eyes, open the exposed individual's eyes while under gently running water. Use sufficient force to open the eyelids. Have the exposed individual "roll" their eyes. Minimum flushing time is for 15 minutes. The exposed individual must seek immediate medical attention.

INHALATION: If vapors, mists, or sprays generated by this product are inhaled, remove exposed individual to fresh air. Remove or cover gross contamination to avoid exposure to rescuers.

INGESTION: Routine use of this product is not expected to cause any situation which could lead to ingestion. If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT ASSISTANCE INFORMATION. Exposed individual must seek immediate medical attention. Never induce vomiting or give diluents (milk or water) by mouth to someone who is unconscious, having convulsions, or unable to swallow.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Skin and respiratory disorders, as well as conditions involving the "Target Organs" (see Section 2, Hazards Identification) which may be aggravated by prolonged exposures to this product. Exposed individual must seek immediate medical attention if any adverse effect occurs.

NOTES TO PHYSICIAN: Treat symptomatically. Treat symptoms as demonstrated by signs and distress in the patient.

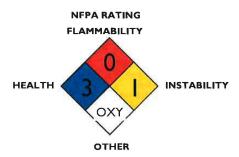
SECTION 5 - FIRE FIGHTING MEASURES

FIRE EXTINGUISHING MATERIALS: Water spray, fog or mist. Alcohol resistant foam. Do not use ammonium phosphate (ABC), other dry chemical extinguishers or CO2.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Oxidizing material. Forms explosive mixtures with combustible organic or other easily oxidizable materials. May release hydrogen bromide or bromine gas, nitrogen oxides, hydrogen chloride

materials. May release hydrogen bromide or bromine gas, nitrogen oxides, hydrogen when wet. Fire causes formation of toxic gases.

SPECIAL FIRE-FIGHTING PROCEDURES: Wear self-contained breathing apparatus and full protective gear. Keep run-off water out of sewers and water sources. Dike for water control.



WATER TREATMENT EXPERTISE SINCE 1904

www.g-c.com Page 2 of 5

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application

FORMULA 314-T



SECTION 6 - ACCIDENTAL RELEASE MEASURES

WARNING: Any drum expansion or rounding indicates pressure build-up. Use extreme caution. When opening, release pressure slowly through lifting edge of lid carefully.

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by appropriately trained personnel using pre-planned procedures. Proper protective equipment should be used.

Small Spill: Collect and place in an appropriate waste disposal container.

Large Spill: Non-flammable corrosive oxidizing solid. Restrict access to the area. Avoid contact with water. Provide adequate protective equipment and ventilation. Stop leak if without risk. Remove chemicals which can react with the spilled material. Use DRY earth sand or other non-combustible material to collect and dry product. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Prevent entry into surface waters, sewers, basements or confined areas, dike if needed. Decontaminate the area thoroughly. Decontaminate all response equipment with soapy water before returning to service. Place all spill residue in a suitable container and seal. Dispose of in accordance with U.S. Federal, State, and local hazardous waste disposal regulations, those of Canada and its Provinces, those of Australia, Japan and EU Member States (see Section 13, Disposal Considerations), as appropriate.

SECTION 7 - HANDLING AND STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat, drink, smoke, or apply cosmetics while handling this product. Avoid breathing vapors or mists generated by this product. Use in a well-ventilated location. Remove contaminated clothing immediately.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Open containers slowly on a stable surface. Containers of this product must be properly labeled. Storage areas of this product should be clearly identified, well-illuminated, clear of obstruction and accessible only to trained and authorized personnel. Store containers in a cool, dry location, away from direct sunlight, heat, sparks or open flame. Keep container tightly closed when not in use. Storage class: oxidizer storage.

SECTION 8 - EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation. Eyewash/safety shower station is recommended to be available near where this product is used.

EXPOSURE LIMITS/GUIDELINES:

EXPOSURE LIMITS IN AIR

CHEMICAL NAME	CAS#	ACGIH TLV		OSHA PEL	OTHER	
		TWA	STEL	TWA		
I-BROMO-3-CHLORO-5,5- DIMETHYL-HYDANTOIN	16079-88-2	NE	NE	NE	NONE	

NE = Not Established

RESPIRATORY PROTECTION: Maintain airborne contaminant concentrations below guidelines listed above, if applicable. Air-purifying respirators with dust/mist/fume filters are recommended if operations may produce mists or sprays from this product.

EYE PROTECTION: Chemical safety goggles. A face shield may also be necessary.

SKIN PROTECTION: Use chemically-resistant gloves (rubber, neoprene or pvc) when handling this product. Wear apron or protective clothing in case of contact.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE and COLOR:	White to off-white tablet	VAPOR PRESSURE, mm Hg @ 20°C :	NA
ODOR:	Slight odor Halogen	VAPOR DENSITY (Air=I):	NA
pH:	3.5 @ 0.15%	SPECIFIC GRAVITY@20°C (water=1):	NA
MELTING/FREEZING POINT:	145-160°C	SOLUBILITY IN WATER:	Slightly
BOILING POINT:	NA	PARTITION COEFFICIENT (n-octanol/wa	ter) Not established
FLASHPOINT:	Non-flammable	AUTOIGNITION TEMPERATURE:	NA
EVAPORATION RATE (n-BuAc=1):	NA	DECOMPOSITION TEMPERATURE:	Not established
FLAMMABLE LIMITS (in air by volume, %): NA	VISCOSITY:	NA
		VOLATILE ORGANIC COMPOUNDS (%) None

WATER TREATMENT EXPERTISE SINCE 1904

FORMULA 314-T

www.g-c.com

Page 3 of 5



SECTION 10 - STABILITY AND REACTIVITY

REACTIVITY: Not established

STABILITY: Stable under normal temperature condition. Avoid moisture.

HAZARDOUS DECOMPOSITION: Toxic gases/vapors/fumes of: Hydrogen Bromide, Bromine, Hydrogen chloride, chlorine, oxides of carbon,

Nitrogen.

HAZARDOUS POLYMERIZATION: Will not occur.

INCOMPATIBLE MATERIALS: Hydrocarbons, strong acids, strong alkalies, strong oxides, strong reducing agents.

CONDITIONS TO AVOID: Avoid contact with oxidizers or reducing agents. Avoid contact with acids and alkalies. Avoid heat, flames and other sources of ignition. Avoid moisture.

SECTION | | - TOXICOLOGICAL INFORMATION

1-BROMO-3-CHLORO-5,5-DIMETHYL-HYDANTOIN:

Oral: LD50: rats, 578 mg/kg Dermal: LD50: rabbits, 2000mg/kg

Toxicological Information: Ames test negative

Inhalation: May cause irritation to the respiratory system.

Carcinogenicity: None of the components of this product are listed by the NTP, IARC, or regulated by OSHA as carcinogens.

BIOLOGICAL EXPOSURE INDICES: Currently, Biological Exposure Indices (BEIs) have not been determined for the components of this product.

SECTION 12 - ECOLOGICAL INFORMATION

Environmental Fate:

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: Not determined

COD: 1.005 g/g. Material is expected to present a low bioaccumulation potential.

Environmental Toxicity: ECOLOGICAL DATA: Fish: LC50: 96 hr = .87 mg/l Algae: No Data

Daphnia: LC50: 48 hr = .48 mg/l

Acute Toxicity: LC50: 96hours, 640 mg/l American Oyster.

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL: Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations, those of Canada, Australia, EU Member States and/or Japan, as appropriate. Absorb in vermiculite or dry sand.

SECTION 14 - TRANSPORTATION INFORMATION

DOT

Proper Shipping Name: OXIDIZING SOLID, N.O.S., 5.1, PGII, (I-BROMO-3-CHLORO-5,5-DIMETHYLHYDANTOIN)

Hazard Class: 5.1 UN No.: 1479 Packing Group: II

Transport Description: UN1479, OXIDIZING SOLID, N.O.S., 5.1, PGII, (I-BROMO-3-CHLORO-5,5-DIMETHYLHYDANTOIN)

ERG 140

IMDG/IMO Class: 5.1 Packing Group: II UN No.: 1479

IMO Labeling and Marking: 5.1

Proper Shipping Name: UN1479, OXIDIZING SOLID, N.O.S., 5.1, PGII, (I-BROMO-3-CHLORO-5,5-DIMETHYLHYDANTOIN)

IATA/ICAO Class: 5.1 Packing Group: II UN No.: 1479 IATA/ICAO Labeling: 5.1

Proper Shipping Name: UN1479, OXIDIZING SOLID, N.O.S., 5.1, PGII, (1-BROMO-3-CHLORO-5,5-DIMETHYLHYDANTOIN)

PRODUCT REQUIRES OXIDIZER LABEL

WATER TREATMENT EXPERTISE SINCE 1904

FORMULA 314-T www.g-c.com

Page 4 of 5

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



SECTION 15 - REGULATORY INFORMATION

United States and International Regulations

United States Regulations: U.S. SARA REPORTING REQUIREMENTS: The components of this product are subject to the reporting as listed below, requirements of Sections 302, 304, and 313 of Title of the Superfund Amendments and Reauthorization Act:

CHEMICAL NAME

I-BROMO-3-CHLORO-5,5-DIMETHYL-

HYDANTOIN

SARA 302 (40CFR 355, APPENDIX A) - NO SARA 304 (40CFR TABLE 302.4) - NO SARA 313 (40CFR 372.65) - NO

U.S. Regulations

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for the components of this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs (4,540 kg) therefore applies, per 40 CFR 370.20. U.S. CERCLA REPORTABLE QUANTITY (RQ): Not listed

U.S. TSCA INVENTORY STATUS: The components of this product are listed on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS:

SARA TITLE 311/312 HAZARD CATEGORY: ACUTE: YES CHRONIC: NO FIRE: YES REACTIVITY: NO

STATE REGULATIONS

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No component of this product is on the Proposition 65 List.

International Regulations

CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: The components of this product are on the DSL or NDSL Inventories

CANADIAN WHMIS CLASSIFICATION: CLASS D; Div2 Material causing other Toxic effects (Very Toxic)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations.

This material or all of its components are listed on the Canadian Domestic Substances List (DSL).

This material or all of its components are listed (or considered as having been notified) on the European Inventory of Existing Chemical

Other Inventory Lists:, Korea (TCCL), Australia (AISC), China (Draft), PICCS (Philippines-RA6969), Japan (ENCS METI/MOL).

SECTION 16 - OTHER INFORMATION

Formula 314-T is registered with the NSF to the NSF International Registration Guidelines for Proprietary Substances and Nonfood Compounds for category codes G5, G7, etc.; with NSF Reg. No. 113139.

PREPARED BY: Garratt Callahan

REVISION DATE: March 06, 2012

SUPERCEDES: September 14, 2010

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purpose or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose.

WATER TREATMENT EXPERTISE SINCE 1904

FORMULA 314-T

www.g-c.com

Page 5 of 5



FORMULA 2011





MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI, Canadian WHMIS Standards, Australian WorkSafe, Japanese Industrial Standard JIS Z 7250:2000, and European Directives

SECTION I - PRODUCT IDENTIFICATION

Product Name: FORMULA 2011

Product Use: COOLING WATER TREATMENT

UN NUMBER: Not applicable

U.N. DANGEROUS GOOD CLASS/SUBSIDIARY RISK: Not applicable

MANUFACTURER'S NAME: Garratt-Callahan Company

ADDRESS: 50 Ingold Road, Burlingame, CA 94010-2206

EMERGENCY PHONE: North America: CHEMTREC: 1-800-424-9300
Outside North America: +1-703-527-3887

BUSINESS PHONE: Product Information: 650-697-5811

MSDS Number: SD2011
DATE OF REVISION: 2/22/2011

SECTION 2 - HAZARDS IDENTIFICATION

EU LABELING AND CLASSIFICATION: Components of this product have not been classified as defined by the European Economic Community Guidelines (EECC). This product has not been classified by the EECC.

EU CLASSIFICATION: Not classified.

EU RISK PHRASES: Not classified.

EU SAFETY PHRASES: Not classified.

DANGER! THIS PRODUCT IS A NON-FLAMMABLE, CLEAR LIGHT YELLOW LIQUID WITH SLIGHT ORGANIC ODOR. MAY CAUSE EYE AND SKIN IRRITATION. MAY CAUSE RESPIRATORY TRACT IRRITATION.

HEALTH EFFECTS AND RISKS FROM EXPOSURE:

ACUTE: Contact with skin and eyes will cause burning and irritation. Do not wear contact lenses when using this product. Ingestion will cause gastric distress and possible depression of the central nervous system.

CHRONIC: Repeated or prolonged exposure to this product can produce target organ damage. Repeated exposure of the eyes can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation can produce varying degrees of respiratory irritation or lung damage.

TARGET ORGANS:

ACUTE: Skin, eyes, respiratory system. CHRONIC: Skin, respiratory system

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH HAZARD (BLUE)				
FLAMMABILITY HAZARD (RED)	0			

REACTIVITY HAZARD (YELLOW)

Hazard Scale
0=Minimal
1=Slight
2=Moderate
3=Serious
4=Severe
*=Chronic hazard



WATER TREATMENT EXPERTISE SINCE 1904

FORMULA 2011

www.g-c.com

Page I of 5



SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS						
Hazardous Ingredients	CAS#	HAZARDOUS	EC#	ICSC#	WT %	Classification; Risk Phrases
PHOSPHONOBUTANE TRICARBOXYLIC ACID	37971-36-1	YES	253-733-5	NE	< 5	Not classified
monosodium phosphate	7558-80-7	YES	231-449-2	NE	< 5	Not classified
BENZOTRIAZOLE	95-14-7	YES	202-394-1	1091	< 3	Not classified
PHOSPHINOCARBOXYLIC ACID	71050-62-9	YES	NE	NE	1	Not classified

NOTE: ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-2004 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR, EU Directives and the Japanese Industrial Standard JIS Z 7250: 2000. See Section 2 for full text of Risk Phrases and Safety Phrases.

SECTION 4 - FIRST AID MEASURES

Exposed individuals must be taken for medical attention if any adverse effect occurs. Take a copy of this MSDS to the health professional with the

SKIN EXPOSURE: If this product contaminates the skin, begin decontamination with running water and soap. Minimum flushing time is for 15 minutes. Remove exposed or contaminated clothing, taking care not to contaminate the eyes. The exposed individual must seek medical attention if any adverse effect occurs.

EYE EXPOSURE: If vapors, mists, or sprays are generated by this product and enter the eyes, open the exposed individual's eyes while under gently running water. Use sufficient force to open the eyelids. Have the exposed individual "roll" their eyes. Minimum flushing time is for 15 minutes. The exposed individual must seek immediate medical attention.

INHALATION: If vapors, mists, or sprays generated by this product are inhaled, remove exposed individual to fresh air. Remove or cover gross contamination to avoid exposure to rescuers.

INGESTION: Routine use of this product is not expected to cause any situation which could lead to ingestion. If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT ASSISTANCE INFORMATION. Exposed individual must seek immediate medical attention. Never induce vomiting or give diluents (milk or water) by mouth to someone who is unconscious, having convulsions, or unable to

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Skin and respiratory disorders, as well as conditions involving the "Target Organs" (see Section 2, Hazard Identification) which may be aggravated by prolonged exposures to this product. Exposed individual must seek immediate medical attention if any adverse effect occurs.

NOTES TO PHYSICIAN: Treat symptomatically. Treat symptoms as demonstrated by signs and distress in the patient.

SECTION 5 - FIRE FIGHTING MEASURES

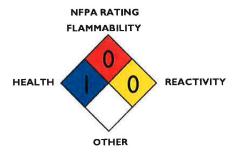
FIRE EXTINGUISHING MATERIALS:

Use media appropriate for the surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: No unusual hazards.

SPECIAL FIRE-FIGHTING PROCEDURES:

In case of fire wear full positive-pressure self-contained breathing apparatus and protective suit.



WATER TREATMENT EXPERTISE SINCE 1904

www.g-c.com

Page 2 of 5

FORMULA 2011



SECTION 6 - ACCIDENTAL RELEASE MEASURES

WARNING: Any container expansion or rounding indicates pressure build-up. Use extreme caution. When opening, release pressure slowly through opening.

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by appropriately trained personnel using pre-planned procedures. Proper protective equipment should be used.

Small Spill: Mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Restrict access to the area. Provide adequate protective equipment and ventilation. Stop leak if without risk. Remove chemicals which can react with the spilled material. Add dry inert material to contain and absorb spilled material. Prevent entry into surface waters, sewers, basements or confined areas, dike if needed. Ensure that exposure to product is not at a concentration exceeding regulatory limits. Decontaminate the area thoroughly. Decontaminate all response equipment with soapy water before returning to service. Place all spill residue in a suitable container and seal. Dispose of in accordance with U.S. Federal, State, and local hazardous waste disposal regulations, those of Canada and its Provinces, those of Australia, Japan and EU Member States (see Section 13, Disposal Considerations), as appropriate.

SECTION 7 - HANDLING AND STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat, drink, smoke, or apply cosmetics while handling this product. Avoid breathing vapors or mists generated by this product. Use in a well-ventilated location. Remove contaminated clothing immediately.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Open containers slowly on a stable surface. Containers of this product must be properly labeled. Storage areas of this product should be clearly identified, well-illuminated, clear of obstruction and accessible only to trained and authorized personnel. Store containers in a cool, dry location, away from direct sunlight, at temperatures between 50°F - 100°F. Keep container tightly closed when not in use.

SECTION 8 - EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation. Ensure eyewash/safety shower station is available near where this product is used.

EXPOSURE LIMITS/GUIDELINES:

EXPOSURE LIMITS IN AIR

CHEMICAL NAME	CAS#	ACGII TWA	H TLV STEL	OSHA PEL TWA	OTHER	
PHOSPHONOBUTANE TRICARBOXYLIC ACID	37971-36-1	NE	NE	NE	NONE	
MONOSODIUM PHOSPHATE	7558-80-7	NE	NE	NE	NONE	
BENZOTRIAZOLE	95-14-7	NE	NE	NE	NONE	
PHOSPHINOCARBOXYLIC ACID	71050-62-9	NE	NE	NE	NONE	

NE = Not Established

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132 and 1910.138) or equivalent standard of Canada, European Standard DIN EN 374, Australian Standards, relevant Japanese Standards, or EU member states (including EN 149 for respiratory PPE, and EN 166 for face/eye protection). If necessary, refer to appropriate Standards of Canada, EU, Australia, or Japan.

RESPIRATORY PROTECTION: Maintain airborne contaminant concentrations below guidelines listed above, if applicable. If necessary, use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), equivalent U.S. State standards, Canadian CSA Standard Z94.4-93, the European Standard EN149, or EU member states. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under U.S. Federal OSHA's Respiratory Protection Standard (1910.134-1998) or the regulations of various U.S. States, Canada, EU Member States, or those of Japan. Air-purifying respirators with dust/mist/fume filters are recommended if operations may produce mists or sprays from this product.

EYE PROTECTION: Chemical safety goggles. A face shield may also be necessary, If necessary, refer to U.S. OSHA 29 CFR 1910.133, Canadian Standards, and the European Standard EN166, Australian Standards, or relevant Japanese Standards.

SKIN PROTECTION: Use chemically-resistant, such as Butyl rubber, Nitrile or polyvinyl alcohol gloves when handling this product. If necessary, refer to U.S. OSHA 29 CFR 1910.138, the European Standard DIN EN 374, the appropriate Standards of Canada, Australian Standards, or relevant Japanese Standards. Use body protection appropriate for task (e.g. lab coat, overalls).

WATER TREATMENT EXPERTISE SINCE 1904

FORMULA 2011

www.g-c.com

Page 3 of 5

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

VAPOR PRESSURE, mm Hg @ 20°C: Not determined APPEARANCE and COLOR: Clear light yellow liquid VAPOR DENSITY (Air=10): Not determined ODOR: Slight Organic 1.04 - 1.06 SPECIFIC GRAVITY@20°C (water=1): 2.0 - 4.0SOLUBILITY IN WATER: MELTING/FREEZING POINT: NA Complete > 212 °F (100 °C) PARTITION COEFFICIENT (n-octanol/water) Not established **BOILING POINT: AUTOIGNITION TEMPERATURE:** Not established FLASHPOINT: Non-flammable **DECOMPOSITION TEMPERATURE:** Not established EVAPORATION RATE (n-BuAc=1): Not established FLAMMABLE LIMITS (in air by volume, %): Not established VISCOSITY: Not established

SECTION 10 - STABILITY AND REACTIVITY

REACTIVITY: Not established

STABILITY: Stable

HAZARDOUS DECOMPOSITION: When heated to decomposition, product may emit toxic fumes of oxides of carbon, nitrogen, phosphorous and

sulfur.

HAZARDOUS POLYMERIZATION: Will not occur.

INCOMPATIBLE MATERIALS: Bases
CONDITIONS TO AVOID: None known

SECTION 11 - TOXICOLOGICAL INFORMATION

SUSPECTED CANCER AGENT: The components of this product are not found on the following lists: FEDERAL OSHA Z LIST, NTP, IARC, or CAL/OSHA and therefore are not considered to be, nor suspected to be, cancer-causing agents by these agencies.

BIOLOGICAL EXPOSURE INDICES: Currently, Biological Exposure Indices (BEIs) have not been determined for the components of this product.

SECTION 12 - ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: The components of this product will slowly degrade under ambient environmental conditions to other organic compounds. The following information is available for the main components of this product.

ECOLOGICAL DATA:

Fish: Flathead Minnow, LC50, 5359 ppm

Algae: No data available

Water Flea, LC50, Daphnia magna, 7071 ppm

BOD5 and COD: Material not expected to bioaccumulate.

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL: Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations, those of Canada, Australia, EU Member States and/or Japan, as appropriate.

SECTION 14 - TRANSPORTATION INFORMATION

US DOT - NOT REGULATED ICAO/IATA - NOT REGULATED IMO/IMDG - NOT REGULATED

WATER TREATMENT EXPERTISE SINCE 1904

FORMULA 2011 www.g-c.com

Page 4 of 5



SECTION 15 - REGULATORY INFORMATION

United States and International Regulations

United States Regulations: U.S. SARA REPORTING REQUIREMENTS: The components of this product are subject to the reporting requirements of Sections 302, 304, and 313 of Title of the Superfund Amendments and Reauthorization Act, listed below:

CHEMICAL NAME

PHOSPHONOBUTANE TRICARBOXYLIC ACID SARA 302 (40 CFR 355, Appendix A) - NO SARA 304 (40 CFR Table 302.4) - NO

SARA 313 (40 CFR 372.65) - NO

MONOSODIUM PHOSPHATE

SARA 302 (40 CFR 355, Appendix A) - NO SARA 304 (40 CFR Table 302.4) - NO SARA 313 (40 CFR 372.65) - NO

BENZOTRIAZOLE

SARA 302 (40 CFR 355, Appendix A) - NO SARA 304 (40 CFR Table 302.4) - NO

SARA 313 (40 CFR 372.65) - NO

PHOSPHINOCARBOXYLIC ACID

SARA 302 (40 CFR 355, Appendix A) - NO SARA 304 (40 CFR Table 302.4) - NO SARA 313 (40 CFR 372.65) - NO

U.S. Regulations

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for the components of this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs (4,540 kg) therefore applies, per 40 CFR 370.20.U.S. CERCLA REPORTABLE QUANTITY (RQ): None

U.S. TSCA INVENTORY STATUS: The components of this product are listed on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS:

SARA Title 311/312, Hazard Category: Acute Health: NO; Chronic: YES; Fire: NO; Reactive: NO; Sudden Release of Pressure: NO

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No component of this product is on the Proposition 65 List.

International Regulations

CANADIAN REGULATIONS

CANADIAN DSL/NDSL INVENTORY STATUS: The components of this product are on the DSL or NDSL Inventories CANADIAN WHMIS CLASSIFICATION: Not classified.

This material or its components are listed (or considered as having been notified) on the European Inventory of Existing Chemical Substances (EINECS).

Other Inventory Lists:, Korea (TCCL), Australia (AISC), China (Draft), PICCS (Philippines-RA6969), Japan (ENCS METI/MOL).

SECTION 16 - OTHER INFORMATION

PREPARED BY: Garratt Callahan

Revision Date: February 22, 2011

Supercedes: June 6, 2008

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purpose or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose.

WATER TREATMENT EXPERTISE SINCE 1904

FORMULA 2011

www.g-c.com

Page 5 of 5



VITA-D-CHLOR TABLETS



ITA-D-CHLOR™ Tablets

Manufactured by: Integra Chemical Co 1216 6th Ave N Kent WA 98032 253.479.7000

SAFETY DATA SHEET

SDS Number: 26645. Revision 002 Revision date: July 7, 2017 Page 1 of 2

24 Hour Emergency Response: CHEMTREC 800-424-9300 (Outside USA: 703-527-3887)

1. IDENTIFICATION

Vita-D-Chlor™ Tablets Product name:

Chemical family: Organic acid

Product number: All Integra Chemical item numbers beginning with V325.50

Recommended use: Dechlorination

Restrictions on use: No information available

2. HAZARDS IDENTIFICATION

Not a hazardous substance or mixture OSHA classification:

Label elements & precautionary statements: Not applicable Hazards not otherwise classified: None identified

3. COMPOSITION/INFORMATION ON INGREDIENTS

None of the components of this product are hazardous materials

4. FIRST AID PROCEDURES

Skin contact: Wash with soap and water. Seek medical attention if irritation develops Eye contact: Flush eyes with plenty of water. If irritation persists, seek medical attention.

Inhalation: Remove to fresh air.

Do not induce vomiting. Rinse mouth. If adverse symptoms develop, seek medical attention. Ingestion:

5. FIRE-FIGHTING MEASURES

Extinguishing media: Water spray, carbon dioxide, dry chemical, or foam.

Use water to cool nearby containers and structures. Wear full protective equipment, including Special equipment/precautions:

suitable respiratory protection.

Specific hazards: As with most organic solids, combustion is possible at elevated temperatures.

Hazardous combustion products: Oxides of carbon (CO, CO₂)

6. ACCIDENTAL RELEASE MEASURES

Sweep or scoop into clean, dry disposal container. Wear suitable protective equipment. Flush spill area with water.

7. HANDLING AND STORAGE

Storage and handling: Store in a cool, dry, well-ventilated area away from incompatible materials. Keep containers tightly

closed and protect them from physical damage. Protect from direct light and minimize contact with air. Keep

material dry

Incompatible with strong acids, strong bases, strong oxidizers. Incompatible materials:

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

OSHA & ACGIH exposure limits: None established

Engineering controls: Use adequate general or local exhaust ventilation to keep fume and/or dust levels as low as

possible

Not available

Respiratory protection: None needed unless use generates annoying or irritating dusts, mists or vapors. Use a NIOSH

approved respirator mask if necessary.

Skin & eye protective equipment: Safety glasses.

Facilities storing or utilizing this material should be equipped with an eyewash facility and safety shower. Always handle material in accordance with good chemical handling, industrial hygiene, and safety practices.

9. PHYSICAL AND CHEMICAL PROPERTIES

Melting/freezing point:

Not available 25/8" tablets Boiling point: Appearance: Slight citrus odor Flash point: Not available Odor Evaporation rate: Not available Not available Odor threshold: pH (1% aqueous solution): 2 to 3 Flammability: Not available

LA-UR-19-22215



VITA-D-CHLOR™ Tablets

Manufactured by: Integra Chemical Co 1216 6th Ave N Kent WA 98032 253.479.7000

SAFETY DATA SHEET

SDS Number: 26645, Revision 002
Revision date: July 7, 2017
Page 2 of 2

24 Hour Emergency Response: CHEMTREC 800-424-9300 (Outside USA: 703-527-3887)

9. PHYSICAL AND CHEMICAL PROPERTIES continued

Flammable or explosive Upper: Not available Solubility: 33g/100mL water @25°C

Limits (% by volume in air) Lower: Not available Partition coefficient: Not available Not available Not available Auto-ignition temperature: Vapor pressure: Vapor density: Not available Decomposition temperature: Not available Relative density: Not available Viscosity: Not available

10. STABILITY AND REACTIVITY

Reactivity: No information available

Stability: Stable

Possibility of hazardous reactions: Hazardous polymerization will not occur

Conditions to avoid: Exposure to light, air, moisture and high temperatures Incompatibles: Incompatible with strong acids, strong bases, strong oxidizers

Decomposition products: Oxides of carbon (CO, CO₂)

11. TOXICOLOGICAL INFORMATION

Effects of overexposure:

Inhalation: Inhalation may irritate the nose, throat and upper respiratory tract.

Skin contact: Excessive contact may cause skin irritation.

Eye contact: Contact may cause eye irritation.

Ingestion: Ingestion of small amounts is not likely to produce harmful effects.

Chronic effects: Chronic ingestion of large quantities may cause gastrointestinal effects including nausea, diarrhea, urine

acidification, oxalate and uric crystallization in the bladder and kidneys, decreased reaction times, psychomotor

coordination.

Target organs: None identified Additional effects: No information available

Reproductive effects: None identified

Carcinogenicity: No listings by NTP, IARC, or OSHA

Toxicity data: No information available

12. ECOLOGICAL INFORMATION

No information available

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all local, state and federal regulations.

14. TRANSPORTATION INFORMATION

Material is not classified as a dangerous good via either ground or air transportation.

15. REGULATORY INFORMATION

All components are listed in the United States TSCA inventory.

This product is not controlled under WHMIS

16. OTHER INFORMATION

OSHA SDS #: 26645, rev 002; July 7, 2017

The information presented above is offered for informational purposes only. This SDS, and the associated product, is intended for use only by technically qualified persons, and at their own discretion and risk. Since conditions and manner of use are outside the control of Integra Chemical Company, we make no warranties, either expressed or implied, and assume no liability in connection with any use of the information.



BRIGHT DYES FLT YELLOW/GREEN LIQUID





Safety Data Sheet

Issue Date: 04-Oct-2013 Revision Date: 06-Feb-2017 Version Number: 1.1

1. Identification

Product Identifiers

Product Name: Bright Dyes® FLT Yellow/Green Liquid

Product Number: 106001

Recommended Use & Restrictions on Use

Water tracing & leak detection dye

Manufacturer/Supplier

Kingscote Chemicals, Inc. 3334 South Tech Blvd. Miamisburg, OH 45342

U.S.A.

Emergency Telephone Number

Company Telephone Number: (937) 886-9100

Emergency Telephone (24 hr): INFOTRAC (800) 535-5053 (North America)

+1-352-323-3500 (International)

2. Hazards Identification

Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least

15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs:

Get medical advice/attention.

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek

medical attention immediately.

Page 1 of 6



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give

anything by mouth to an unconscious person. Get medical attention if large

quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation.

Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the

system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media

Water spray (fog). Carbon dioxide (CO2). Dry chemical. Regular foam.

Unsuitable Extinguishing Media

Not determined

Specific Hazards Arising from the Chemical

Product is not flammable. Burning/combustion may produce oxides of carbon and nitrogen (NOx).

<u>Protective Equipment and Precautions for Firefighters</u>

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or

groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area

with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices.

Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing

should be thoroughly washed before reuse.

Page 2 of 6



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry, and well-

ventilated area. Keep from freezing.

Incompatible Materials Acids.

8. Exposure Controls / Personal Protection

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection Goggles.

Skin & Body Protection Rubber gloves. Suitable protective clothing.

Respiratory Protection No protection is ordinarily required under normal conditions of use.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practices.

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

 Physical State
 Liquid
 Odor
 None apparent

 Appearance
 Yellow/green liquid
 Odor Threshold
 Not determined

Color Yellow/green

PropertyValuespH>8.0Melting/Freezing Point~32° FBoiling Point/Range~212° FFlash PointNot applicable

Evaporation Rate 1.8

Flammability (solid, gas) Liquid – not applicable Upper Flammability Limits Not applicable

Lower Flammability Limits Not applicable Vapor Pressure Not applicable

Vapor Density 0.6

Relative Density
Specific Gravity
Solubility
Partition Coefficient
Auto-ignition Temperature
Decomposition Temperature
Viscosity
Not applicable
Not determined
Not determined
Not determined
Not determined
Not determined

Page 3 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Liquid

10. Stability and Reactivity

Reactivity

Not reactive under normal conditions.

Chemical Stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials

Acids. Strong oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation Avoid breathing vapors or mists.

Ingestion Do not ingest.

Skin Contact May cause an allergic skin reaction.

Eye Contact Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure

May cause an allergic skin reaction.

Numerical Measures of Toxicity

Not determined

Symptoms Associated with Exposure

See Section 4 of this SDS for symptoms.

Carcinogenicity

NTP None

IARC None

OSHA None

Page **4** of **6**

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Liquid

12. Ecological Information

Ecotoxicity

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Not available

Persistence/Degradability

Not determined

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. Disposal Considerations

Waste Disposal Methods

Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

<u>Note</u>

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

OMDG Not regulated

15: Regulatory Information

International Inventories

TASCA This product is not subject to TSCA 12(b) reporting requirements.

U.S. Federal Regulations

CERCLA This material, as supplied, does not contain any substances regulated as

hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Page 5 of 6



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization

Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of

Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants

pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable

state right-to-know regulations.

16: Other Information					
HMIS Health Hazards	Flammability 0	Instability 0	Special Hazards Not determined		
<u>NFPA</u> Health Hazards 1	Flammability 0	Physical Hazards O	Personal Protection B		
Issue Date	04-Oct-2013				
Revision Date	06-Feb-2017				
Revision Note	Content Review				

<u>Disclaimer</u>

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Page 6 of 6



BRIGH DYES FLT YELLOW/GREEN TABLE





Safety Data Sheet

Issue Date: 09-Nov-2013 Revision Date: 06-Feb-2017 Version Number: 2.1

1. Identification

Product Identifiers

Product Name: Bright Dyes® FLT Yellow/Green Tablet

Product Number: 101101

Recommended Use & Restrictions on Use

Water tracing & leak detection dye

Manufacturer/Supplier

Kingscote Chemicals, Inc. 3334 South Tech Blvd. Miamisburg, OH 45342

U.S.A.

Emergency Telephone Number

Company Telephone Number: (937) 886-9100

Emergency Telephone (24 hr): INFOTRAC (800) 535-5053 (North America)

+1-352-323-3500 (International)

2. Hazards Identification

Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least

15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs:

Get medical advice/attention.

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek

medical attention immediately.

Page 1 of 6



Bright Dyes® FLT Yellow/Green Tablet

Revision Date: 06-Feb-2017

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give

anything by mouth to an unconscious person. Get medical attention if large

quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation.

Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the

system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media

Water spray (fog). Carbon dioxide (CO2). Dry chemical.

Unsuitable Extinguishing Media

Not determined

Specific Hazards Arising from the Chemical

Remote possibility of dust explosion. Burning may produce oxides of carbon and nitrogen (NOx).

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or

groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area

with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices.

Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing

should not be allowed out of the workplace.

Page 2 of 6



Bright Dyes® FLT Yellow/Green Tablet

Revision Date: 06-Feb-2017

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry, and well-

ventilated area. Store away from heat, sparks, open flame or any other

ignition source.

Incompatible Materials Bromine trifluoride. Lithium. Strong acids, bases, and oxidizing agents.

8. Exposure Controls / Personal Protection

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection Avoid contact with eyes.

Skin & Body Protection Rubber gloves. Suitable protective clothing.

Respiratory Protection Use NIOSH-approved dust mask if dusty conditions exist.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practices.

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

Values

Physical StateSolidOdorNone apparentAppearanceOrange tabletOdor ThresholdNot determined

Color Orange

Property

pН Not applicable **Melting/Freezing Point** Not applicable **Boiling Point/Range** Not applicable **Flash Point** Not applicable **Evaporation Rate** Not applicable Flammability (solid, gas) Not flammable **Upper Flammability Limits** Not applicable **Lower Flammability Limits** Not applicable Not applicable Vapor Pressure Not applicable **Vapor Density** Not applicable **Relative Density Specific Gravity** Not applicable

Solubility Highly soluble in water with small amounts of insoluble residue

 Partition Coefficient
 Not determined

 Auto-ignition Temperature
 Not determined

 Decomposition Temperature
 Not determined

 Viscosity
 Not determined

Page **3** of **6**

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Tablet

10. Stability and Reactivity

Reactivity

Not reactive under normal conditions.

Chemical Stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials

Bromine trifluoride. Lithium. Strong acids, bases, and oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation Avoid inhalation of dust.

Ingestion Do not ingest.

Skin Contact May cause an allergic skin reaction.

Eye Contact Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure

May cause an allergic skin reaction.

Numerical Measures of Toxicity

Not determined

Symptoms Associated with Exposure

See Section 4 of this SDS for symptoms.

Carcinogenicity

NTP None

IARC None

OSHA None

Page 4 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Tablet

12. Ecological Information

Ecotoxicity

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Not available

Persistence/Degradability

This product is biodegradable.

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. Disposal Considerations

Waste Disposal Methods

Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

Note

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

OMDG Not regulated

15: Regulatory Information

International Inventories

Not determined

U.S. Federal Regulations

CERCLA This material, as supplied, does not contain any substances regulated as

hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Page 5 of 6



Bright Dyes® FLT Yellow/Green Tablet

Revision Date: 06-Feb-2017

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization

Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of

Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants

pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable

state right-to-know regulations.

16: Other Information

HMIS Health Hazards	Flammability 0	Instability O	Special Hazards Not determined
<u>NFPA</u> Health Hazards 1	Flammability O	Physical Hazards O	Personal Protection B
Issue Date	09-Nov-2013		
Revision Date	06-Feb-2017		
Revision Note	Content Review		

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End of Safety Data Sheet

Page 6 of 6



Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application Outfall 03A181 Fact Sheet

TA-55 Facility Operations TA-55-6 Cooling Towers





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Table of Contents

1.0	OUTFALL LOCATION [Section I]	5
2.0	FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]	
2.1	Process Schematic and Water Balance [II.A]	5
2.2	Water Treatment Processes [II.B]	5
2.3	Discharge Rate and Frequency [II.C]	6
3.0	PRODUCTION [Section III]	6
4.0	IMPROVEMENTS [Section IV]	ε
5.0	INTAKE AND EFFLUENT CHARACTERISTICS [Section V]	7
5.1	Analytical Data [V.A, B, and C]	7
5.2	Potential Pollutants [V.D]	7
6.0	POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]	7
7.0	BIOLOGICAL TOXICITY TESTING DATA [Section VII]	7
8.0	CONTRACT ANALYSIS INFORMATION [Section VIII]	7
ATTAC	CHMENT A: Location Map for Outfall 03A181	A-1
ATTAC	CHMENT B: Process Schematic and Water Balance	B-1
ATTAC	CHMENT C: Photographs	
ATTAC	CHMENT D: Summary Discharge Monitoring Report September 2014 – September 2018	D-1
ATTAC	CHMENT E: Safety Data Sheets	E-1

List of Tables

- 1 Sources for Discharges to Outfall 03A181
- Wastewater Treatment Codes Assigned to Outfall 03A181
- 3 List of Treatment Chemicals used in the Operations that Contribute to Outfall 03A181
- 5 Flow Rates and Frequencies for Discharges to Outfall 03A181
- 6 Potential Pollutants by Source for Outfall 03A181
- 7 List of Independent Laboratories Used for NPDES Water Analysis



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INDUSTRIAL AND SANITARY OUTFALLS 2019 NPDES PERMIT RE-APPLICATION OUTFALL 03A181 FACT SHEET

1.0 OUTFALL LOCATION [Section I]

Outfall ID No.:	03A181	Outfall Location:	Technical Area 55
Category:	03A, Treated Cooling	Originating Structure	TA-55-006
	Water Discharges	for the Discharge:	
Flow Type:	Intermittent	Receiving Stream: Effluent Canyon, Tributary to Mortandad	
			in Water Quality Segment 20.6.4.128 NMAC
Longitude:	106°18′05″W	Latitude:	35°51′51″N

2.0 FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]

Outfall 03A181 is located at TA-55 and discharges to Effluent Canyon which is a tributary to Mortandad Canyon in Water Quality Segment 20.6.4.128 NMAC. The outfall discharges treated cooling water that originates at TA-55-006. Attachment A provides a location map. The cooling tower blow-down is comprised of potable water that is treated by the cooling tower water treatment system. Table 1 identifies the discharge source, the source location, and source composition.

	Table 1					
	Sources for Discharges to Outfall 03181					
TA	A Building Source Transportation Mode Discharge Source					
	Type (Piping, Truck etc.) Source Composition					
55	6	Cooling	Piping	TA-55 Cooling	Treated Cooling Tower Blowdown	
				Towers	Potable Water Used as Makeup Water	

2.1 Process Schematic and Water Balance [II.A]

A process schematic line drawing that shows the route taken by water from intake to the discharge at Outfall 03A181 is provided in Attachment B. This drawing includes all operations that contribute cooling water to the discharge at the outfall. A water balance is also provided on the process schematic with average flows for the cooling tower intakes and blowdown. The water balance is based upon actual data collected from cooling tower operations personnel and the flow meter/totalizer associated with the outfall.

2.2 Water Treatment Processes [II.B]

This outfall receives treated cooling tower blowdown. The feed line to the chemical injection unit comes off of the cooling tower supply line. The water is routed through the injection unit where chemicals are added to the stream. While in the chemical unit the pH, conductivity, and other properties are read. The water exits the chemical unit and goes back into the cooling tower supply line into the chillers. A biocide is added manually to the cooling tower basin as needed. The blowdown water comes off the cooling tower pump discharge through a solenoid valve and a flow totalizer where part of the blowdown is routed through a turbulator, which adds the chlorine reduction/scavenger chemical. From there the water is routed to the outfall. The tower basin has an overflow line where chlorine reduction/scavenger chemical can be added if it discharges to the outfall. Table 2 identifies the wastewater treatment codes associated with the water treatment system. Attachment C provides photographs of the outfall, cooling towers, and the wastewater treatment equipment.

Table 2				
Wastewater Treatment Codes Assigned to Outfall 03A181				
Treatment Code	de Description Justification			
2-E	Dechlorination	Chlorine Reduction/Scavenger Chemicals		
2-H	Disinfection (other)	Chemicals are added to Control Microorganisms		
2-L	Reduction	Chemicals that are Corrosion Inhibitors		

EPA ID No. NM0890010515

The water treatment processes identified in Table 2 utilize chemicals to monitor the water quality in the cooling tower, control corrosion, limit biological growth, and de-chlorinate blowdown prior to discharge. Table 3 provides a list of the chemicals used to treat the water in the cooling towers.

	Table 3 List of Treatment Chemicals used in the Operations that Contribute to Outfall 03A181				
Source	Chemical Name	Reason for Use	Toxic Pollutant and/or Hazardous Substances from Table 2C-3 or 2C-4		
TA-55-006	NALCO 3DT128/228	Corrosion Inhibitor	Phosphoric acid	2C-4	
Cooling			Sulfuric acid	2C-4	
Towers			Benzotriazole	NA	
	NALCO 3DT156	Scale Inhibitor	NA	NA	
	NALCO 3DT288	Corrosion Inhibitor	Phosphoric acid	2C-4	
			Sulfuric acid	2C-4	
			Benzotriazole	NA	
	NALCO 2597	Industrial Water Treatment	Sulfuric acid	2C-4	
	NALCO 7408	Chlorine Reduction/Scavenger	Sodium bisulfite	2C-4	
	NALCO 90005	Biocide/Disinfectant	Dimethyl-Dioctyl-Ammonium Chloride	NA	
			Glycerol	NA	
	NORWECO Inc. Enviro-C	Dechlorination tablets	Ascorbic acid	NA	
	Bright Dyes FLT Yellow-	Water Line and Drain	NA	NA	
	Green Liquid	Tracing Dye			
	Bright Dyes FLT Yellow-	Water Line and Drain	NA	NA	
	Green Tablet	Tracing Dye			

2.3 Discharge Rate and Frequency [II.C]

The discharge rates and frequencies for Outfall 03A181 are provided in Table 4.

Table 4 Flow Rates and Frequencies for Discharges to Outfall 03A181							
	Freque	ency		Flow R	ates and Vo	lumes	
Source ^a	Days/Week	Months	Average (MGD)	Maximum (MGD)	Average Volume (GPD)	Maximum Volume (GPD)	Duration (days)
TA-55-006 Cooling Towers	7.0	12.0	0.009	0.032	9,365	31,986	365

Calculated data collected between October 2017 and September 2018.

GPD = gallons per day; MGD = million gallons per day

3.0 PRODUCTION [Section III]

Section III is not applicable to Outfall 03A181.

4.0 IMPROVEMENTS [Section IV]

Future changes may include the routing of the TA-55 Cooling Tower blowdown, currently discharging through Outfall 03A181 to the Reuse Tank (TA-3-336) at TA-3. If implemented, the discharge will either be transferred to SERF for treatment and reuse or discharged to Outfall 001. A Notice of Change will be submitted for these future changes prior to their implementation and impact to the outfall. Attachment B provides a proposed future process schematic showing this potential future configuration.

5.0 INTAKE AND EFFLUENT CHARACTERISTICS [Section V]

5.1 Analytical Data [V.A, B, and C]

The analytical results provided for the Outfall 03A181 Permit Reapplication on the Form 2C were provided from the following sources:

- Samples collected on August 20 22, 2018 and shipped to an independent laboratory for analysis.
- Field samples collected and analyzed on August 20 22, 2018 for temperature, residual chlorine, and pH.
- Field samples collected and analyzed on January 17, 2019 for sulfite.
- Discharge Monitoring Report summary for Outfall 03A181 from October 2014 to September 2018 (Attachment D).
- Hardness = 103.6 mg/L (CaCO₃)

5.2 Potential Pollutants [V.D]

The treatment chemicals associated with the Cooling Tower water treatment system and the use of potable water constitute the pollutant load of the discharge to Outfall 03A181. Table 5 identifies the Table 2C-3 and 2C-4 pollutants by discharge source. It also identifies those pollutants (if any) that were detected in the analytical results from the samples collected for the 2019 Permit Renewal Application.

Table 5 Potential Pollutants by Source for Outfall 03A181				
Source Description	POTENTIA Toxic Pollutant and/o Substances Table 2	or Hazardous	Analytical Data From Outfall 03A181 ^a	
TA-55-006 Cooling Towers	Phosphoric Acid	2C-4	pH = 7.1 – 8.8 S.U. Total phosphorus = 6 mg/L	
	Sulfuric Acid	2C-4	pH = 7.1 – 8.8 S.U.	
	Sodium Bisulfite	2C-4	Sulfite = 9.7 mg/L	
Potable Water used as Makeup Water	Chlorine	2C-4	Total Residual Chlorine = 0	

a. Results are from the representative sample collected at Outfall 03A181 on August 20 – 22, 2018.

The safety data sheets associated with the chemicals used in the water treatment system are provided in Attachment E.

6.0 POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]

Section VI is not applicable to Outfall 03A181.

7.0 BIOLOGICAL TOXICITY TESTING DATA [Section VII]

Section VII is not applicable to Outfall 03A181.

8.0 CONTRACT ANALYSIS INFORMATION [Section VIII]

Samples from the cooling tower blowdown were collected on August 20 - 22, 2018 for the Form 2C constituents required by the permit application forms. These samples were submitted to independent laboratories as summarized in Table 6.

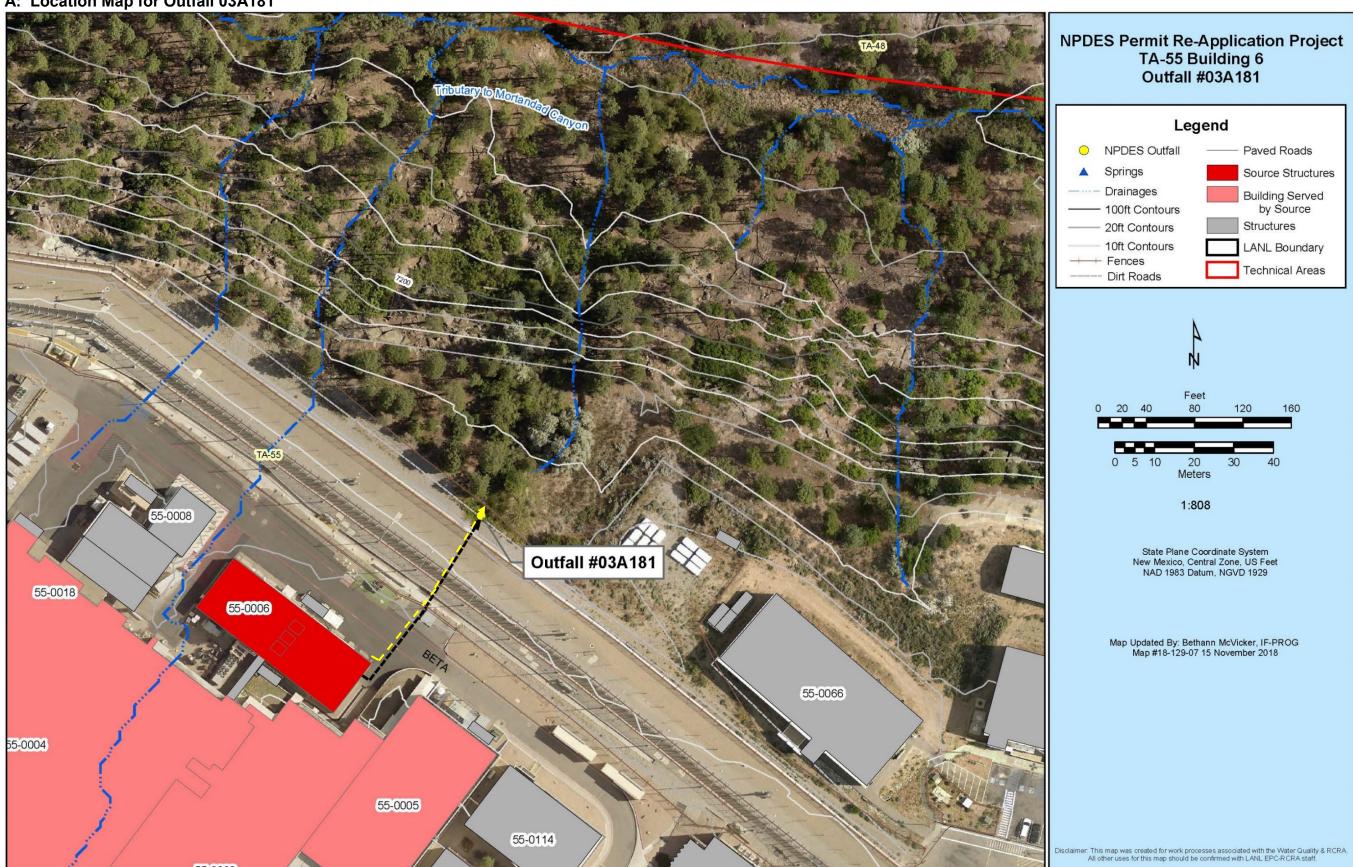
	Table 6 List of Independent Laboratories Used for NPDES Water Analysis				
Laboratory Name	Address and Contact Info	Analytes			
GEL Laboratories LLC	2040 Savage Road Charleston SC 29407 (843) 556-8171	Biological Oxygen Demand, Total Suspended Solids, General Chemistry, Pesticides, Polychlorinated Biphenyls, Radiochemistry, Semi-Volatile Organic Compounds, Total Metals, Volatile Organic Compounds			

EPA ID No. NM0890010515

Table 6 List of Independent Laboratories Used for NPDES Water Analysis				
Laboratory Name	Address and Contact Info	Analytes		
New Mexico Water Testing Laboratory, Inc.	401 North Coronado Ave Espanola, NM 87532 (505) 929-4545	E.coli		
Cape Fear Analytical LLC	3306 Kitty Hawk Road Suite 120 Wilmington, NC 28405 (910) 795-0421	TCDD (Dioxin)		

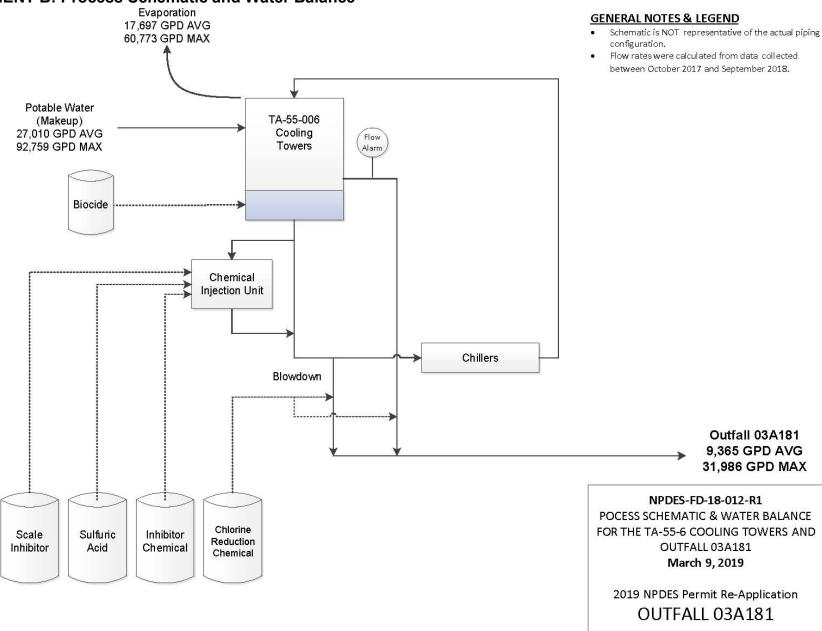


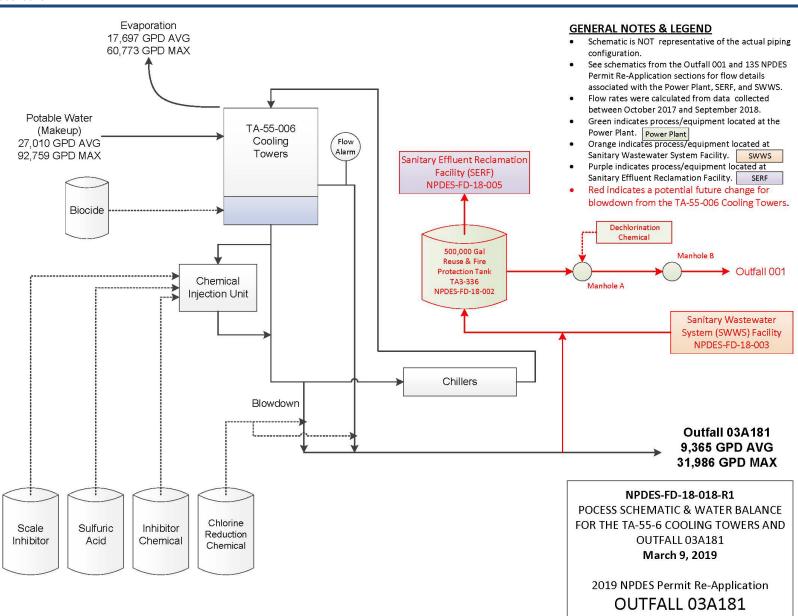
ATTACHMENT A: Location Map for Outfall 03A181



21 71 12 1101 111110000010010

ATTACHMENT B: Process Schematic and Water Balance







ATTACHMENT C: Photographs

Photograph ID No.	Photograph Title
NPDES-03A181-18-001	Outfall 03A181 Location and Receiving Stream Effluent Canyon a Tributary to Mortandad Canyon, Water Quality Segment Number 20.6.4.128 NMAC
NPDES-03A181-18-002	Outfall 03A181 Condition at Discharge Location
NPDES-03A181-18-003	TA-55-006 Cooling Towers
NPDES-03A181-18-004	TA-55-006 Cooling Towers Chemical Treatment System Control Panel
NPDES-03A181-18-005	TA-55-006 Cooling Towers Chemical Treatment System Storage Tanks



Photograph - NPDES-03A181-18-001 Outfall 03A181 Location and Receiving Stream Effluent Canyon a Tributary of Mortandad Canyon, Water Quality Segment Number 20.6.4.128 NMAC

LA-UR-19-22215 Attachment C C-1 of 3



Photograph - NPDES-03A181-18-002
Outfall 03A181 Condition at Discharge Location



Photograph - NPDES-03A181-18-003 TA-55-006 Cooling Towers





Photograph - NPDES-03A181-18-004
TA-55-006 Cooling Towers Chemical Treatment System Control Panel



Photograph - NPDES-03A181-18-005
TA-55-006 Cooling Towers Chemical Treatment System Storage Tanks



ATTACHMENT D: Summary Discharge Monitoring Report September 2014 – September 2018

					Quantity o	r Loading		Quality or 0	Concentration						
OUTFALL No.	TA - Bldg.	Year	Monitoring Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Number of Samples	Frequency
03A181	TA55-6	2014	Oct	Flow (Totalized Est.)	0.002995	0.003708	MGD							31	Daily
03A181	TA55-6	2014	Nov	Flow (Totalized Est.)	0.001826	0.003462	MGD							30	Daily
03A181	TA55-6	2014	Dec	Flow (Totalized Est.)	0.001624	0.003900	MGD							31	Daily
03A181	TA55-6	2015	Jan	Flow (Totalized Est.)	0.003433	0.004247	MGD							31	Daily
03A181	TA55-6	2015	Feb	Flow (Totalized Est.)	0.003306	0.003982	MGD							28	Daily
03A181	TA55-6	2015	Mar	Flow (Totalized Est.)	0.002550	0.003401	MGD							31	Daily
03A181	TA55-6	2015	Apr	Flow (Totalized Est.)	0.001716	0.002458	MGD							30	Daily
03A181	TA55-6	2015	May	Flow (Totalized Est.)	0.004132	0.014310	MGD							31	Daily
03A181	TA55-6	2015	Jun	Flow (Totalized Est.)	0.013540	0.017050	MGD							30	Daily
03A181	TA55-6	2015	Jul	Flow (Totalized Est.)	0.011030	0.016590	MGD							31	Daily
03A181	TA55-6	2015	Aug	Flow (Totalized Est.)	0.008155	0.013090	MGD							31	Daily
03A181	TA55-6	2015	Sept	Flow (Totalized Est.)	0.006082	0.009905	MGD							30	Daily
03A181	TA55-6	2015	Oct	Flow (Totalized Est.)	0.003980	0.006528	MGD							31	Daily
03A181	TA55-6	2015	Nov	Flow (Totalized Est.)	0.002775	0.004912	MGD							30	Daily
03A181	TA55-6	2015	Dec	Flow (Totalized Est.)	0.001889	0.003354	MGD							31	Daily
03A181	TA55-6	2016	Jan	Flow (Totalized Est.)	0.002412	0.003925	MGD							31	Daily
03A181	TA55-6	2016	Feb	Flow (Totalized Est.)	0.003394	0.012915	MGD							29	Daily
03A181	TA55-6	2016	Mar	Flow (Totalized Est.)	0.006934	0.016987	MGD							31	Daily
03A181	TA55-6	2016	Apr	Flow (Totalized Est.)	0.003470	0.008798	MGD							30	Daily
03A181	TA55-6	2016	May	Flow (Totalized Est.)	0.005203	0.008469	MGD							31	Daily
03A181	TA55-6	2016	Jun	Flow (Totalized Est.)	0.011750	0.029610	MGD							30	Daily
03A181	TA55-6	2016	Jul	Flow (Totalized Est.)	0.010960	0.014807	MGD							31	Daily
03A181	TA55-6	2016	Aug	Flow (Totalized Est.)	0.007695	0.012500	MGD							31	Daily
03A181	TA55-6	2016	Sept	Flow (Totalized Est.)	0.005237	0.007383	MGD							30	Daily
03A181	TA55-6	2016	Oct	Flow (Totalized Est.)	0.006383	0.011800	MGD							31	Daily
03A181	TA55-6	2016	Nov	Flow (Totalized Est.)	0.004885	0.007715	MGD							30	Daily
03A181	TA55-6	2016	Dec	Flow (Totalized Est.)	0.002697	0.004189	MGD							31	Daily
03A181	TA55-6	2017	Jan	Flow (Totalized Est.)	0.006129	0.028631	MGD							31	Daily
03A181	TA55-6	2017	Feb	Flow (Totalized Est.)	0.004955	0.008576	MGD							28	Daily
03A181	TA55-6	2017	Mar	Flow (Totalized Est.)	0.005601	0.009394	MGD							31	Daily
03A181	TA55-6	2017	Apr	Flow (Totalized Est.)	0.011237	0.008447	MGD							30	Daily
03A181	TA55-6	2017	May	Flow (Totalized Est.)	0.010537	0.016263	MGD							31	Daily
03A181	TA55-6	2017	Jun	Flow (Totalized Est.)	0.011317	0.015761	MGD							30	Daily
03A181	TA55-6	2017		Flow (Totalized Est.)	0.011410	0.013688	MGD							31	Daily
03A181	TA55-6	2017	Aug	Flow (Totalized Est.)	0.010086	0.012345	MGD							31	Daily
03A181	TA55-6	2017	Sept	Flow (Totalized Est.)	0.008490	0.013309	MGD							30	Daily
03A181	TA55-6	2017	Oct	Flow (Totalized Est.)	0.008333	0.010406	MGD							31	Daily
03A181	TA55-6	2017	Nov	Flow (Totalized Est.)	0.007708	0.011837	MGD							30	Daily
03A181	TA55-6	2017	Dec	Flow (Totalized Est.)	0.005864	0.010391	MGD							31	Daily
03A181	TA55-6	2018	Jan	Flow (Totalized Est.)	0.004958	0.008590	MGD							31	Daily
03A181	TA55-6	2018	Feb	Flow (Totalized Est.)	0.005424	0.008700	MGD							28	Daily



Quantity or Loading Quality or Concentration															
OUTFALL No.	TA - Bldg.	Year	Monitoring Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Number of Samples	Frequency
03A181	TA55-6	2018	Mar	Flow (Totalized Est.)	0.009652	0.028030	MGD							31	Daily
03A181	TA55-6	2018	Apr	Flow (Totalized Est.)	0.014420	0.031990	MGD							30	Daily
03A181	TA55-6	2018	May	Flow (Totalized Est.)	0.011896	0.023251	MGD							31	Daily
03A181	TA55-6	2018	Jun	Flow (Totalized Est.)	0.014210	0.025250	MGD							30	Daily
03A181	TA55-6	2018	Jul	Flow (Totalized Est.)	0.011648	0.016687	MGD							31	Daily
03A181	TA55-6	2018	Aug	Flow (Totalized Est.)	0.008028	0.010370	MGD							31	Daily
03A181	TA55-6	2018	Sept	Flow (Totalized Est.)	0.010230	0.022270	MGD							30	Daily
				Flow (Totalized Est.)		Daily	/ Average		0.0069		mg/L		mg/L	487	
				Flow (Totalized Est.)	Max	imum 30 Day	/ Average		0.0144		mg/L		mg/L	487	
				Flow (Totalized Est.)		N	/laximum			0.0320	mg/L		mg/L	487	
03A181	TA55-6	2014	Oct	рН				7.7	***	8.1	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A181	TA55-6	2014	Nov	рН				7.9	****	8.3	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2014	Dec	рН				7.8	****	8.6	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A181	TA55-6	2015	Jan	рН				8.1	****	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2015	Feb	рН				8.5	****	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2015	Mar	рН				8.1	****	8.8	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A181	TA55-6	2015	Apr	рН				8.1	****	8.6	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A181	TA55-6	2015	May	рН				8.2	****	8.4	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2015	Jun	рН				8.2	****	8.5	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2015	Jul	рН				8.1	****	8.4	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A181	TA55-6	2015	Aug	рН				8.2	****	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2015	Sept	рН				8.3	****	8.6	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A181	TA55-6	2015	Oct	рН				8.1	****	8.8	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2015	Nov	рН				7.2	****	8.2	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2015	Dec	рН				8.4	****	8.7	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A181	TA55-6	2016	Jan	рН				8.5	****	8.7	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2016	Feb	рН				8.4	****	8.7	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2016	Mar	рН				8.2	****	8.6	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A181	TA55-6	2016	Apr	рН				8.4	****	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2016	May	рН				8.2	****	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2016	Jun	рН				8.3	****	8.5	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A181	TA55-6	2016	Jul	рН				8.2	****	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2016	Aug	рН				8.2	****	8.4	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A181	TA55-6	2016	Sept	pH				8.3	****	8.5	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2016	•	pH				7.1	****	8.2	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2016	Nov	pH				7.1	***	8.5	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A181	TA55-6	2016	Dec	pH				7.7	***	8.3	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2017	Jan	pH				8.5	***	8.7	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2017		pH				8.4	****	8.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2017		pH				8.2	****	8.5	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A181	TA55-6	2017		pH				8.3	****	8.5	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2017	•	pH				8.2	****	8.4	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2017	•	рН				8.3	***	8.4	S.U.	6.0 - 9.0	S.U.	5.0	Weekly



			Quantity or Loading Quality or Concentration												
OUTFALL No.	TA - Bldg.	Year	Monitoring Period	Parameter		Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Number of Samples	Frequency
03A181	TA55-6	2017	Jul	рН				8.1	***	8.4	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2017	Aug	рН				8.1	****	8.4	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A181	TA55-6	2017	Sept	рН				8.4	****	8.5	S.U.	6.0 - 9.0	4	4.0	Weekly
03A181	TA55-6	2017	Oct	рН				8.3	****	8.4	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2017	Nov	рН				8.0	****	8.5	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A181	TA55-6	2017	Dec	рН				7.6	****	8.5	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2018	Jan	рН				8.2	****	8.7	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A181	TA55-6	2018	Feb	рН				8.3	****	8.5	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2018	Mar	рН				8.0	****	8.5	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2018	Apr	рН				8.1	****	8.3	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2018	May	рН				8.0	****	8.3	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A181	TA55-6	2018	Jun	рН				7.9	****	8.4	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2018	Jul	рН				8.3	****	8.5	S.U.	6.0 - 9.0	S.U.	5.0	Weekly
03A181	TA55-6	2018	Aug	рН				7.9	****	8.2	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
03A181	TA55-6	2018	Sept	рН				8.1	***	8.0	S.U.	6.0 - 9.0	S.U.	4.0	Weekly
				рН		l	Minimum	7.1						210	
				рН	Max	kimum 30 Day	/ Average		8.6					210	
				рН		N	/laximum			8.8				210	
03A181	TA55-6	2014	Oct	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5	Weekly
03A181	TA55-6	2014	Nov	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4	Weekly
03A181	TA55-6	2014	Dec	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5	Weekly
03A181	TA55-6	2015	Jan	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2015	Feb	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2015	Mar	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly
03A181	TA55-6	2015	Apr	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly
03A181	TA55-6	2015	May	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2015		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2015	Jul	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly
03A181	TA55-6	2015	Aug	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2015	·	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2015		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2015		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2015		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly
03A181	TA55-6	2016		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2016		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2016		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly
03A181	TA55-6	2016	•	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2016	,	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2016		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly
03A181	TA55-6	2016		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2016		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly
03A181	TA55-6	2016		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2016	Oct	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly



EPA ID No. NM0890010515

					Quantity o	r Loading		Quality or C	oncentration						
OUTFALL No.	TA - Bldg.	Year	Monitoring Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Number of Samples	Frequency
03A181	TA55-6	2016	Nov	Total Residual Chlorine				***	***	0	mg/L	0.011	mg/L	5.0	Weekly
03A181	TA55-6	2016	Dec	Total Residual Chlorine				***	***	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2017	Jan	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2017	Feb	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2017	Mar	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly
03A181	TA55-6	2017	Apr	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2017	May	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly
03A181	TA55-6	2017	Jun	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2017	Jul	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2017	Aug	Total Residual Chlorine				***	***	0	mg/L	0.011	mg/L	5.0	Weekly
03A181	TA55-6	2017	Sept	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2017	Oct	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2017	Nov	Total Residual Chlorine				***	***	0	mg/L	0.011	mg/L	5.0	Weekly
03A181	TA55-6	2017	Dec	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2018	Jan	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2018	Feb	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2018	Mar	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	5.0	Weekly
03A181	TA55-6	2018	Apr	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2018	May	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly
03A181	TA55-6	2018	Jun	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2018	Jul	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly
03A181	TA55-6	2018	Aug	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly
03A181	TA55-6	2018	Sept	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	4.0	Weekly
				Total Residual Chlorine		Daily	Average		0.0					209	
				Total Residual Chlorine	Max	imum 30 Day	Average		0					209	
	_			Total Residual Chlorine		N	/laximum			0				209	
03A181	TA55-6	2014	Dec	Total Suspended Solids				****	<1.45	<1.45	mg/L	30 - 100	mg/L	1	Quarterly
03A181	TA55-6	2015	Mar	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly
03A181	TA55-6	2015	Jun	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly
03A181	TA55-6	2015	Sept	Total Suspended Solids				***	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly
03A181	TA55-6	2015	Dec	Total Suspended Solids				***	<0.57	0.57	mg/L	30 - 100	mg/L	1	Quarterly
03A181	TA55-6	2016	Mar	Total Suspended Solids				***	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly
03A181	TA55-6	2016	Jun	Total Suspended Solids				***	0.7	0.7	mg/L	30 - 100	mg/L	1	Quarterly
03A181	TA55-6	2016	Sept	Total Suspended Solids				****	<5.7	<5.7	mg/L	30 - 100	mg/L	1	Quarterly
03A181	TA55-6	2016	Dec	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly
03A181	TA55-6	2017	Mar	Total Suspended Solids				****	0.7	0.7	mg/L	30 - 100	mg/L	1	Quarterly
03A181	TA55-6	2017	Jun	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly
03A181	TA55-6	2017	Sept	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly
03A181	TA55-6	2017	Dec	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly
03A181	TA55-6	2018	Mar	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly
03A181	TA55-6	2018	Jun	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly
03A181	TA55-6	2018		Total Suspended Solids				****	<0.57	0.57	mg/L	30 - 100	mg/L	1	Quarterly



					Quantity of	r Loading	Quality or	Concentration	n					
OUTFALL No.	TA - Bldg.	Year	Monitoring Period	Parameter	Average	Maximum Unit	s Minimum	Average	Maximum	Units	Permit Limit	Units	Number of Samples	Frequency
				Total Suspended Solids		Daily Avera	ge	0.7					16	
Total Suspended Solids		Maximum 30 Day Average		ge	0.7					16				
				Total Suspended Solids	1	Maxim	ım		0.7				16	
3A181	TA55-6	2014	Dec	Phosphorus, Total			****	<1.45	<1.45	mg/L	30 - 100	mg/L	1	Quarterly
3A181	TA55-6	+ +	Mar	Phosphorus, Total			***	3.66	3.66	mg/L	20 - 40	mg/L	1	Quarterly
3A181	TA55-6	2015	Jun	Phosphorus, Total			***	4.08	4.08	mg/L	20 - 40	mg/L	1	Quarterly
3A181	TA55-6		Sept	Phosphorus, Total			***	2.41	2.41	mg/L	20 - 40	mg/L	1	Quarterly
3A181	TA55-6	+ +	Dec	Phosphorus, Total			***	3.42	3.42	mg/L	20 - 40	mg/L	1	Quarterly
3A181	TA55-6	2016	Mar	Phosphorus, Total			****	6	6	mg/L	20 - 40	mg/L	1	Quarterly
3A181	TA55-6	2016	Jun	Phosphorus, Total			****	2.95	2.95	mg/L	20 - 40	mg/L	1	Quarterly
3A181	TA55-6	2016	Sept	Phosphorus, Total			***	0.99	0.99	mg/L	20 - 40	mg/L	1	Quarterly
3A181	TA55-6	2016	Dec	Phosphorus, Total			****	3.39	3.39	mg/L	20 - 40	mg/L	1	Quarterly
)3A181	TA55-6	2017	Mar	Phosphorus, Total			****	4.58	4.58	mg/L	20 - 40	mg/L	1	Quarterly
3A181	TA55-6	2017	Jun	Phosphorus, Total			****	2.51	2.51	mg/L	20 - 40	mg/L	1	Quarterly
3A181	TA55-6	2017	Sept	Phosphorus, Total			***	2.83	2.83	mg/L	20 - 40	mg/L	1	Quarterly
3A181	TA55-6	2017	Dec	Phosphorus, Total			***	2.94	2.94	mg/L	20 - 40	mg/L	1	Quarterly
3A181	TA55-6	2018	Mar	Phosphorus, Total			***	2.54	2.54	mg/L	20 - 40	mg/L	1	Quarterly
3A181	TA55-6	2018	Jun	Phosphorus, Total			****	2.79	2.79	mg/L	20 - 40	mg/L	1	Quarterly
3A181	TA55-6	2018	Sept	Phosphorus, Total			****	2.66	2.66	mg/L	20 - 40	mg/L	1	Quarterly
Phosphorus, Total					Daily Avera	ge	3.2					16		
				Phosphorus, Total	Max	kimum 30 Day Avera	ge	6.0					16	
				Phosphorus, Total	1	Maxim	ım		6.0				16	
3A181	TA55-6	2015	Sept	Copper, Dissolved			****	****	0.00158	mg/L	NA	NA	1	Yearly
3A181	TA55-6	2016	Sept	Copper, Dissolved			****	****	0.00231	mg/L	NA	NA	1	Yearly
)3A181	TA55-6	2017	Sept	Copper, Dissolved			****	****	0.00258	mg/L	NA	NA	1	Yearly
)3A181	TA55-6	2018	Sept	Copper, Dissolved			****	****	0.00243	mg/L	NA	NA	1	Yearly
				Copper, Dissolved		Daily Avera		0.0022					4	
				Copper, Dissolved	Max	kimum 30 Day Avera	ge	0.00258					4	
		T		Copper, Dissolved		Maxim			0.00258				4	
3A181	TA55-6	2015		Aluminum, Total			***	****	<0.015	mg/L	NA	NA	1	Yearly
3A181	TA55-6		Sept	Aluminum, Total			***	****	<0.015	mg/L	NA	NA	1	Yearly
3A181	TA55-6		Sept	Aluminum, Total			***	***	<0.0193	mg/L	NA	NA	1	Yearly
3A181	TA55-6	2018	Sept	Aluminum, Total			***	***	<0.0193	mg/L	NA	NA	1	Yearly
				Aluminum, Total		Daily Avera	_						4	
Aluminum, Total					Max	kimum 30 Day Avera	_	0.00000					4	
				Aluminum, Total		Maxim			0.00000				4	
3A181	TA55-6	2016	Sept	Gross Alpha			****	0.403	0.403	pCi/L	NA	NA	1	Term
				Gross Alpha		Daily Avera	_						1	
Gross Alpha					Max	kimum 30 Day Avera	_						1	
				Gross Alpha		Maxim	ım		0.403				1	



ATTACHMENT E: Safety Data Sheets

LIST OF SAFETY DATA SHEETS
NALCO 3DT128/228
NALCO 3DT156
NALCO 3DT288
NALCO 2597
NALCO 7408
NALCO 90005
NORWECO Inc. Enviro-C
Bright Dyes FLT Yellow-Green Liquid
Bright Dyes FLT Yellow-Green Tablet



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NALCO 3DT128



NALCO Water An Ecolab Company

SAFETY DATA SHEET

3D TRASAR™ 3DT128

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

Product name 3D TRASAR™ 3DT128

Other means of identification Not applicable.

Recommended use COOLING WATER TREATMENT

Restrictions on use Refer to available product literature or ask your local Sales Representative for

restrictions on use and dose limits.

Company Nalco Canada ULC

1055 Truman Street

Burlington, Ontario L7R 3Y9

Canada

TEL: (905)633-1000

Emergency telephone

(800)463-3216 (24 Hours)

number For Transportation Emergencies call CANUTEC 613-996-6666 (24 hours)

2018/07/02 Issuing date

Section: 2. HAZARDS IDENTIFICATION

GHS Classification

Corrosive to metals Category 1 Skin corrosion Category 1A Serious eye damage Category 1

GHS Label element

Hazard pictograms



Signal Word

Hazard Statements May be corrosive to metals.

Causes severe skin burns and eye damage.

Precautionary Statements Prevention:

Keep only in original packaging. Wash skin thoroughly after handling. Wear

protective gloves/ protective clothing/ eye protection/ face protection.

Response:

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician. Wash contaminated clothing before reuse. Absorb spillage to prevent material

damage. Storage:

1/9



SAFETY DATA SHEET

3D TRASAR™ 3DT128

Store locked up.

Other hazards : Do not mix with bleach or other chlorinated products – will cause chlorine gas.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No.	Concentration: (%) (w/w) *
Phosphoric Acid	7664-38-2	5 - 10
Sulfuric Acid	7664-93-9	1 - 5
Benzotriazole	95-14-7	1 - 5

^{*} Ranges if listed above for hazardous ingredient(s) are prescribed ranges. The actual concentration(s) or actual concentration range(s) are being withheld as a trade secret.

Section: 4. FIRST AID MEASURES

In case of eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15

minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Get medical attention immediately.

In case of skin contact : Wash off immediately with plenty of water for at least 15 minutes. Use a mild

soap if available. Wash clothing before reuse. Thoroughly clean shoes before

reuse. Get medical attention immediately.

If swallowed : Rinse mouth with water. Do NOT induce vomiting. Never give anything by

mouth to an unconscious person. Get medical attention immediately.

If inhaled : Remove to fresh air. Treat symptomatically. Get medical attention if symptoms

occur.

Protection of first-aiders : In event of emergency assess the danger before taking action. Do not put

yourself at risk of injury. If in doubt, contact emergency responders. Use

personal protective equipment as required.

Notes to physician : Treat symptomatically.

Most important symptoms and effects, both acute and

delayed

See Section 11 for more detailed information on health effects and symptoms.

Section: 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the

surrounding environment.

Unsuitable extinguishing

media

None known.

Specific hazards during

firefighting

Not flammable or combustible.

Hazardous combustion

products

Decomposition products may include the following materials: Carbon oxides

nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus

2/9

SAFETY DATA SHEET

3D TRASAR™ 3DT128

Special protective equipment :

for firefighters

Use personal protective equipment.

Specific extinguishing

methods

Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. In the event of fire and/or explosion do not

breathe fumes.

Section: 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Avoid inhalation, ingestion and contact with skin and eyes. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Ensure clean-up is conducted by trained personnel only. Refer to protective measures listed in sections 7 and 8.

Environmental precautions

Do not allow contact with soil, surface or ground water.

Methods and materials for containment and cleaning up

Stop leak if safe to do so. Contain spillage, and then collect with noncombustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Flush away traces with water.

Section: 7. HANDLING AND STORAGE

Advice on safe handling

Do not ingest. Do not breathe dust/fume/gas/mist/vapours/spray. Do not get in eyes, on skin, or on clothing. Wash hands thoroughly after handling. Use only with adequate ventilation. Do not mix with bleach or other chlorinated products will cause chlorine gas.

Conditions for safe storage

Keep away from strong bases. Keep out of reach of children. Keep container tightly closed. Store in suitable labelled containers.

Suitable material

The following compatibility data is suggested based on similar product data and/or industry experience: Compatibility with Plastic Materials can vary; we therefore recommend that compatibility is tested prior to use. Polypropylene

Unsuitable material

The following compatibility data is suggested based on similar product data

and/or industry experience: Carbon steel

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Form of exposure	Permissible concentration	Basis
Phosphoric Acid	7664-38-2	TWA	1 mg/m3	ACGIH
		STEL	3 mg/m3	ACGIH
		TWA	1 mg/m3	NIOSH REL
		STEL	3 mg/m3	NIOSH REL
		TWA	1 mg/m3	OSHA Z1
Sulfuric Acid	7664-93-9	TWA (Thoracic	0.2 mg/m3	ACGIH

3/9



3D TRASAR™ 3DT128	
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fraction)		
TWA	1 mg/m3	NIOSH REL
TWA	1 mg/m3	OSHA Z1

Engineering measures : Effective exhaust ventilation system. Maintain air concentrations below

occupational exposure standards.

Personal protective equipment

Eye protection : Safety goggles

Face-shield

Hand protection : Wear the following personal protective equipment:

Standard glove type.

Gloves should be discarded and replaced if there is any indication of

degradation or chemical breakthrough.

Skin protection : Personal protective equipment comprising: suitable protective gloves, safety

goggles and protective clothing

Respiratory protection : When workers are facing concentrations above the exposure limit they must use

appropriate certified respirators.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. Remove

and wash contaminated clothing before re-use. Wash face, hands and any exposed skin thoroughly after handling. Provide suitable facilities for quick drenching or flushing of the eyes and body in case of contact or splash hazard.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid
Colour : Yellow
Odour : Organic
Flash point : > 93.3 °C

pH : no data available
Odour Threshold : no data available
Melting point/freezing point : no data available
Initial boiling point and boiling : no data available

range

Evaporation rate no data available no data available Flammability (solid, gas) Upper explosion limit no data available no data available Lower explosion limit Vapour pressure no data available Relative vapour density no data available Relative density 1.11, (15.5 °C), Density 9.2 lb/gal



3D TRASAR™ 3DT128

Water solubility completely soluble Solubility in other solvents no data available Partition coefficient: nno data available

octanol/water

Auto-ignition temperature no data available Thermal decomposition no data available Viscosity, dynamic no data available Viscosity, kinematic 4.5 mm2/s (20 °C) Molecular weight no data available

Section: 10. STABILITY AND REACTIVITY

Chemical stability Stable under normal conditions.

Possibility of hazardous

reactions

VOC

Do not mix with bleach or other chlorinated products – will cause chlorine gas.

Conditions to avoid None known.

Incompatible materials Strong bases

Strong oxidizing agents

no data available

Hazardous decomposition

products

Decomposition products may include the following materials:

Carbon oxides nitrogen oxides (NOx)

Sulphur oxides Oxides of phosphorus

Section: 11. TOXICOLOGICAL INFORMATION

exposure

Information on likely routes of : Inhalation, Eye contact, Skin contact

Potential Health Effects

Eyes Causes serious eye damage. Skin Causes severe skin burns.

Ingestion Causes digestive tract burns.

Inhalation May cause nose, throat, and lung irritation.

Chronic Exposure Health injuries are not known or expected under normal use.

Experience with human exposure

Eye contact Redness, Pain, Corrosion



3D TRASAR™ 3DT128

Skin contact : Redness, Pain, Corrosion

Ingestion : Corrosion, Abdominal pain

Inhalation : Respiratory irritation, Cough

Toxicity

Product

Acute oral toxicity : Acute toxicity estimate: > 5,000 mg/kg

Acute inhalation toxicity : Acute toxicity estimate: > 10 mg/l

Exposure time: 4 h

Acute dermal toxicity : Acute toxicity estimate: > 5,000 mg/kg

Skin corrosion/irritation : no data available

Serious eye damage/eye

irritation

Result: Mild eye irritation

Respiratory or skin

sensitization

no data available

Reproductive effects : no data available
Germ cell mutagenicity : no data available
Teratogenicity : no data available
STOT - single exposure : no data available
STOT - repeated exposure : no data available
Aspiration toxicity : no data available

Human Hazard Characterization

Based on our hazard characterization, the potential human hazard is: High

Section: 12. ECOLOGICAL INFORMATION

Ecotoxicity

Environmental Effects : This product has no known ecotoxicological effects.

Product

Toxicity to fish : LC50 Rainbow Trout: 1,593 mg/l

Exposure time: 96 h Test substance: Product

NOEC Rainbow Trout: 625 mg/l

Exposure time: 96 h
Test substance: Product

Toxicity to daphnia and other

aquatic invertebrates

LC50 Ceriodaphnia dubia: 3,415 mg/l

Exposure time: 48 h Test substance: Product



3D TRASAR™ 3DT128

NOEC Ceriodaphnia dubia: 2,500 mg/l

Exposure time: 48 h Test substance: Product

Toxicity to algae : no data available

Components

Toxicity to algae : Phosphoric Acid

EC50 Desmodesmus subspicatus (green algae): > 100 mg/l

Exposure time: 72 h

Benzotriazole

EC50 algae: 15.4 mg/l Exposure time: 72 h

Components

Persistence and degradability

The organic portion of this preparation is expected to be inherently biodegradable.

Total Organic Carbon (TOC): 54,000 mg/l

Chemical Oxygen Demand (COD): 130,000 mg/l

Biochemical Oxygen Demand (BOD):

Incubation Period Value Test Descriptor

5 d 2,300 mg/l

Mobility

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.

If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air : <5% Water : 30 - 50% Soil : 50 - 70%

The portion in water is expected to be soluble or dispersible.

Bioaccumulative potential

This preparation or material is not expected to bioaccumulate.

Other information



3D TRASAR™ 3DT128

no data available

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION Based on our hazard characterization, the potential environmental hazard is: Low

Section: 13. DISPOSAL CONSIDERATIONS

In Ontario, the waste class under Regulation 347 is: 148L

Disposal methods : Dispose of wastes in an approved incinerator or waste

treatment/disposal site, in accordance with all applicable regulations. Do not dispose of wastes in local sewer or with

normal garbage

Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in an

approved waste disposal facility.

Disposal considerations : Dispose of as unused product. Empty containers should be

taken to an approved waste handling site for recycling or

disposal. Do not re-use empty containers.

Section: 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

Land transport (TDG)

Proper shipping name : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.

Technical name(s) : PHOSPHORIC ACID, SULFURIC ACID

UN/ID No. : UN 3264

Transport hazard class(es) : 8
Packing group : III

Air transport (IATA)

Proper shipping name : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.

Technical name(s) : PHOSPHORIC ACID, SULFURIC ACID

UN/ID No. : UN 3264

Transport hazard class(es) : 8
Packing group : III

Sea transport (IMDG/IMO)

Proper shipping name : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.

Technical name(s) : PHOSPHORIC ACID, SULFURIC ACID

UN/ID No. : UN 3264

Transport hazard class(es) : 8
Packing group : III

Section: 15. REGULATORY INFORMATION

3D TRASAR™ 3DT128

NPRI Components : Sulfuric Acid

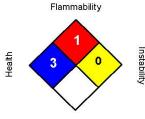
This product has been classified according to the hazard criteria of the HPR and the SDS contains all of the information required by the HPR.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA):

The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

Section: 16. OTHER INFORMATION





Special hazard.

HMIS III:



0 = not significant, 1 = Slight, 2 = Moderate, 3 = High 4 = Extreme, * = Chronic

Revision Date : 2018/07/02

Version Number : 1.2

Prepared By : Regulatory Affairs (905)633-1000

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. For additional copies of an SDS visit www.nalco.com and request access.



NALCO 3DT156



NALCU An Ecolab Company

3D TRASAR® 3DT156

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name 3D TRASAR® 3DT156

Not applicable. Other means of identification

SCALE INHIBITOR Recommended use

Restrictions on use Refer to available product literature or ask your local Sales

Representative for restrictions on use and dose limits.

Company Nalco Company

1601 W. Diehl Road

Naperville, Illinois 60563-1198

USA

TEL: (630)305-1000

Emergency telephone

number

(800) 424-9300 (24 Hours) CHEMTREC

Issuing date : 07/15/2014

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Not a hazardous substance or mixture.

GHS Label element

: Prevention: **Precautionary Statements**

Wash hands thoroughly after handling.

Response:

Specific measures: consult MSDS Section 4. Storage:

Store in accordance with local regulations.

Other hazards : None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

No hazardous ingredients

SECTION 4. FIRST AID MEASURES

In case of eye contact : Rinse with plenty of water. Get medical attention if symptoms occur.

In case of skin contact Wash off with soap and plenty of water. Get medical attention if

symptoms occur.

If swallowed : Rinse mouth. Get medical attention if symptoms occur.

If inhaled : Get medical attention if symptoms occur.

Protection of first-aiders : In event of emergency assess the danger before taking action. Do

not put yourself at risk of injury. If in doubt, contact emergency responders. Use personal protective equipment as required.



Notes to physician

: Treat symptomatically.

See toxicological information (Section 11)

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media

: Use extinguishing measures that are appropriate to local

circumstances and the surrounding environment.

Unsuitable extinguishing

media

: None known.

Specific hazards during

firefighting

: Not flammable or combustible.

Hazardous combustion

products

: Carbon oxides

for firefighters

Special protective equipment : Use personal protective equipment.

Specific extinguishing

methods

: Fire residues and contaminated fire extinguishing water must

be disposed of in accordance with local regulations.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

: Refer to protective measures listed in sections 7 and 8.

Environmental precautions

: No special environmental precautions required.

Methods and materials for containment and cleaning up : Stop leak if safe to do so. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth,

diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Flush away traces with water. For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway.

SECTION 7. HANDLING AND STORAGE

Advice on safe handling

: For personal protection see section 8. Wash hands after handling.

Conditions for safe storage

: Keep out of reach of children. Keep container tightly closed. Store in

suitable labeled containers.

Suitable material

: Keep in properly labelled containers.

Unsuitable material

: not determined

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Contains no substances with occupational exposure limit values.



Engineering measures : Good general ventilation should be sufficient to control worker

exposure to airborne contaminants.

Personal protective equipment

Eye protection : Safety glasses

Hand protection : Wear protective gloves.

Gloves should be discarded and replaced if there is any indication of

degradation or chemical breakthrough.

Skin protection : Wear suitable protective clothing.

Respiratory protection : No personal respiratory protective equipment normally required.

Hygiene measures : Wash hands before breaks and immediately after handling the

product.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid

Colour : Clear Orange

Odour : None Flash point ; > 93.3 °C

: 3.0 - 6.5, 100 % pΗ

(25 °C)

Odour Threshold : no data available : no data available Melting point/freezing point Initial boiling point and boiling : no data available

range

: no data available Evaporation rate Flammability (solid, gas) : no data available : no data available Upper explosion limit Lower explosion limit no data available Vapour pressure no data available Relative vapour density no data available : 1.07 (15.5 °C) Relative density Density 8.9 lb/gal

Water solubility completely soluble Solubility in other solvents : no data available Partition coefficient: n-

octanol/water

: no data available

no data available Auto-ignition temperature Thermal decomposition : Carbon oxides no data available Viscosity, dynamic Viscosity, kinematic : no data available

VOC : 0%

SECTION 10. STABILITY AND REACTIVITY

Chemical stability : Stable under normal conditions.

Possibility of hazardous

reactions

: No dangerous reaction known under conditions of normal use.

Conditions to avoid

: Extremes of temperature

Incompatible materials

: None known

Hazardous decomposition

Carbon oxides

products

SECTION 11. TOXICOLOGICAL INFORMATION

exposure

Information on likely routes of : Inhalation, Eye contact, Skin contact

Potential Health Effects

Eyes : Health injuries are not known or expected under normal use.

Skin : Health injuries are not known or expected under normal use.

Ingestion : Health injuries are not known or expected under normal use.

Inhalation : Health injuries are not known or expected under normal use.

Chronic Exposure : Health injuries are not known or expected under normal use.

Experience with human exposure

Eye contact : No symptoms known or expected.

Skin contact : No symptoms known or expected.

: No symptoms known or expected. Ingestion

Inhalation : No symptoms known or expected.

Toxicity

Product

: Acute toxicity estimate > 5,000 mg/kg Acute oral toxicity

Acute inhalation toxicity : no data available

Acute dermal toxicity : no data available

Skin corrosion/irritation no data available

Serious eye damage/eye

irritation

: no data available

Respiratory or skin

sensitization

: no data available

Carcinogenicity

: no data available

Reproductive effects

: no data available

Germ cell mutagenicity

: no data available

Teratogenicity

: no data available

STOT - single exposure

: no data available

STOT - repeated exposure

: no data available

Aspiration toxicity

: no data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Environmental Effects

: This product has no known ecotoxicological effects.

Product

Toxicity to fish

: LC50 Rainbow Trout: > 10,000 mg/l

Exposure time: 96 hrs Test substance: Product

aquatic invertebrates

Toxicity to daphnia and other : LC50 Daphnia magna: 7,551 mg/l

Exposure time: 48 hrs Test substance: Product

: no data available Toxicity to algae

Persistence and degradability

Chemical Oxygen Demand (COD): 720,000 mg/l

Biochemical Oxygen Demand (BOD):

Test Descriptor Incubation Period Value **Product** 5 d 675 mg/l

Mobility

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models. If released into the environment this material is expected to distribute to the air, water and

soil/sediment in the approximate respective percentages;

: <5% Air Water : 10 - 30% : 70 - 90% Soil

The portion in water is expected to be soluble or dispersible.

Bioaccumulative potential

This preparation or material is not expected to bioaccumulate.

Other information

no data available

SECTION 13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it is not a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

Disposal methods

: Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in an approved waste disposal facility.

Disposal considerations

 Dispose of as unused product. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

Land transport (DOT)

Proper shipping name

: PRODUCT IS NOT REGULATED DURING

TRANSPORTATION

Air transport (IATA)

Proper shipping name

: PRODUCT IS NOT REGULATED DURING

TRANSPORTATION

Sea Transport (IMDG/IMO)

Proper shipping name

PRODUCT IS NOT REGULATED DURING

TRANSPORTATION

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : No SARA Hazards

SARA 302 : SARA 302: No chemicals in this material are subject to the reporting

requirements of SARA Title III, Section 302.

SARA 313 : SARA 313: This material does not contain any chemical components

with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

California Prop 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

INTERNATIONAL CHEMICAL CONTROL LAWS:

TOXIC SUBSTANCES CONTROL ACT (TSCA)

The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA)

The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

AUSTRALIA

All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

CHINA

All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on or exempt from the Inventory of Existing Chemical Substances China (IECSC).

JAPAN

This product contains substance(s) which are not in compliance with the Law Regulating the Manufacture and Importation Of Chemical Substances and are not listed on the Existing and New Chemical Substances list (ENCS).

KOREA

This product contains substance(s) which are not in compliance with the Toxic Chemical Control Law (TCCL) and may require additional review.

NEW ZEALAND

All substances in this product comply with the Hazardous Substances and New Organisms (HSNO) Act 1996, and are listed on or are exempt from the New Zealand Inventory of Chemicals.

PHILIPPINES

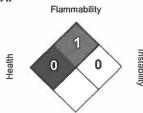
All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

SECTION 16. OTHER INFORMATION

EPA ID No. NM0890010515

3D TRASAR® 3DT156

NFPA:



Special hazard.

HMIS III:

HEALTH	0
FLAMMABILITY	1
PHYSICAL HAZARD	0

0 = not significant, 1 = Slight, 2 = Moderate, 3 = High 4 = Extreme, * = Chronic

Revision Date : 07/15/2014

Version Number : 1.0

Prepared By : Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

For additional copies of an MSDS visit www.nalco.com and request access.



NALCO 3DT288



NALCO

SAFETY DATA SHEET

An Ecolab Company

3D TRASAR® 3DT288

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : 3D TRASAR® 3DT288

Other means of identification : Not applicable.

Recommended use : COOLING WATER TREATMENT

Restrictions on use : Refer to available product literature or ask your local Sales Representative for

restrictions on use and dose limits.

Company : Nalco Company

1601 W. Diehl Road

Naperville, Illinois 60563-1198

USA

TEL: (630)305-1000

Emergency telephone

number

(800) 424-9300 (24 Hours) CHEMTREC

Issuing date : 09/08/2015

Section: 2. HAZARDS IDENTIFICATION

GHS Classification

Skin corrosion : Category 1A Serious eye damage : Category 1

GHS Label element

Hazard pictograms



Signal Word : Danger

Hazard Statements : Causes severe skin burns and eye damage.

Precautionary Statements : Prevention:

Do not mix with bleach or other chlorinated products – will cause chlorine gas. Wash skin thoroughly after handling. Wear protective gloves/ protective clothing/

eye protection/ face protection.

Response:

IF SWALLOWED: rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician. Wash contaminated clothing before reuse.

Storage: Store locked up. Disposal:



3D TRASAR® 3DT288

Dispose of contents/ container to an approved waste disposal plant.

Other hazards Do not mix with bleach or other chlorinated products - will cause chlorine gas.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance/mixture Mixture

Chemical Name CAS-No. Concentration: (%)

Phosphoric Acid 7664-38-2 5 - 10 Sulfuric Acid 7664-93-9 1 - 5 95-14-7 Benzotriazole 1 - 5

Section: 4. FIRST AID MEASURES

Rinse immediately with plenty of water, also under the eyelids, for at least 15 In case of eye contact

minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Get medical attention immediately.

In case of skin contact Wash off immediately with plenty of water for at least 15 minutes. Use a mild

soap if available. Wash clothing before reuse. Thoroughly clean shoes before

reuse. Get medical attention immediately.

If swallowed Rinse mouth with water. Do NOT induce vomiting. Never give anything by

mouth to an unconscious person. Get medical attention immediately.

If inhaled Remove to fresh air. Treat symptomatically. Get medical attention if symptoms

occur.

Protection of first-aiders In event of emergency assess the danger before taking action. Do not put

yourself at risk of injury. If in doubt, contact emergency responders. Use

personal protective equipment as required.

Notes to physician Treat symptomatically.

Most important symptoms and effects, both acute and

delayed

See Section 11 for more detailed information on health effects and symptoms.

Section: 5. FIREFIGHTING MEASURES

Suitable extinguishing media Use extinguishing measures that are appropriate to local circumstances and the

surrounding environment.

Unsuitable extinguishing

media

None known.

Specific hazards during

firefighting

Not flammable or combustible.

2/10

Hazardous combustion

products

Carbon oxides Sulphur oxides Oxides of phosphorus nitrogen oxides (NOx)

Special protective equipment : Use personal protective equipment.

3D TRASAR® 3DT288

for firefighters

Specific extinguishing

methods

Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. In the event of fire and/or explosion do not

breathe fumes.

Section: 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Avoid inhalation, ingestion and contact with skin and eyes. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Ensure clean-up is conducted by trained personnel only. Refer to protective measures listed in sections 7 and 8.

Environmental precautions

Do not allow contact with soil, surface or ground water.

Methods and materials for containment and cleaning up

Stop leak if safe to do so. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Flush away traces with water. For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway.

Section: 7. HANDLING AND STORAGE

Advice on safe handling

Do not ingest. Do not mix with bleach or other chlorinated products – will cause chlorine gas. Do not breathe dust/fume/gas/mist/vapours/spray. Do not get in eyes, on skin, or on clothing. Wash hands thoroughly after handling. Use only with adequate ventilation.

Conditions for safe storage

Keep away from strong bases. Keep out of reach of children. Keep container tightly closed. Store in suitable labeled containers.

Suitable material

The following compatibility data is suggested based on similar product data and/or industry experience: Buna-N, EPDM, Epoxy phenolic resin, HDPE (high density polyethylene), Polyethylene, Polypropylene, PVC, Chlorosulfonated

polyethylene rubber

Unsuitable material

The following compatibility data is suggested based on similar product data and/or industry experience: Stainless Steel 304, Brass, Neoprene,

Polyurethane, Stainless Steel 316L, 100% phenolic resin liner, Fluoroelastomer

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Form of exposure	Permissible concentration	Basis
Phosphoric Acid	7664-38-2	TWA	1 mg/m3	ACGIH
		STEL	3 mg/m3	ACGIH
		TWA	1 mg/m3	NIOSH REL
		STEL	3 mg/m3	NIOSH REL



3D TRASAR® 3DT288

TWA 1 mg/m3 OSHA Z1

Engineering measures : Effective exhaust ventilation system. Maintain air concentrations

below occupational exposure standards.

Personal protective equipment

Eye protection : Safety goggles

Face-shield

Hand protection : Wear protective gloves.

Gloves should be discarded and replaced if there is any indication of

degradation or chemical breakthrough.

Skin protection : Personal protective equipment comprising: suitable protective

gloves, safety goggles and protective clothing

Respiratory protection : When workers are facing concentrations above the exposure limit

they must use appropriate certified respirators.

Hygiene measures : Handle in accordance with good industrial hygiene and safety

practice. Remove and wash contaminated clothing before re-use. Wash face, hands and any exposed skin thoroughly after handling. Provide suitable facilities for quick drenching or flushing of the eyes

and body in case of contact or splash hazard.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid

Colour : brown

Odour : odourless

Flash point : does not flash

pH : 1.4, 100 %

Odour Threshold : no data available

Melting point/freezing point : no data available

Initial boiling point and boiling

range

: 100.6 °C

Evaporation rate : no data available Flammability (solid, gas) : no data available Upper explosion limit : no data available Lower explosion limit : no data available Vapour pressure : 0.5 mm Hg (37.8 °C) Relative vapour density : no data available Relative density : 1.15 (25 °C) Density : 1.15 g/cm3

9.56 lb/gal



3D TRASAR® 3DT288

Water solubility : completely soluble Solubility in other solvents : no data available Partition coefficient: n-: no data available

octanol/water

Auto-ignition temperature Thermal decomposition

temperature

: no data available : no data available

Viscosity, dynamic : 4.7 mPa.s (25 °C)

Viscosity, kinematic : no data available Molecular weight : no data available

VOC : 0.45 % Calculation method

Section: 10. STABILITY AND REACTIVITY

Chemical stability : Stable under normal conditions.

Possibility of hazardous

reactions

Do not mix with bleach or other chlorinated products - will cause

chlorine gas.

Conditions to avoid : None known.

Incompatible materials Bases

Contact with strong alkalies (e.g. ammonia and its solutions, carbonates, sodium hydroxide (caustic), potassium hydroxide, calcium hydroxide (lime), cyanide, sulfide, hypochlorites, chlorites) may generate heat, splattering or boiling and toxic vapors. Contact with reactive metals (e.g. aluminum) may result in the

generation of flammable hydrogen gas.

Hazardous decomposition

products

Oxides of carbon Oxides of sulfur Oxides of phosphorus Oxides of nitrogen

Section: 11. TOXICOLOGICAL INFORMATION

exposure

Information on likely routes of : Inhalation, Eye contact, Skin contact

Potential Health Effects

Eyes : Causes serious eye damage.

Skin : Causes severe skin burns.

Ingestion : Causes digestive tract burns.

Inhalation : May cause nose, throat, and lung irritation.



3D TRASAR® 3DT288

Chronic Exposure : Health injuries are not known or expected under normal use.

Experience with human exposure

Eye contact : Redness, Pain, Corrosion

Skin contact : Redness, Pain, Corrosion

Ingestion : Corrosion, Abdominal pain

Inhalation : Respiratory irritation, Cough

Toxicity

Product

Acute oral toxicity : Acute toxicity estimate : > 5,000 mg/kg

Acute inhalation toxicity : Acute toxicity estimate : > 10 mg/l

Exposure time: 4 h

Acute dermal toxicity : Acute toxicity estimate : > 5,000 mg/kg

Skin corrosion/irritation : no data available

Serious eye damage/eye

irritation

: no data available

Respiratory or skin

sensitization

: no data available

Carcinogenicity : no data available

Reproductive effects : no data available

Germ cell mutagenicity : no data available

Teratogenicity : no data available

STOT - single exposure : no data available

STOT - repeated exposure : no data available

Aspiration toxicity : no data available

Section: 12. ECOLOGICAL INFORMATION

Ecotoxicity

Environmental Effects : This product has no known ecotoxicological effects.

Product



3D TRASAR® 3DT288

Toxicity to fish : LC50 Pimephales promelas (fathead minnow): 2,500 mg/l

Exposure time: 96 hrs Test substance: Product

LC50 Oncorhynchus mykiss (rainbow trout): 1,211 mg/l

Exposure time: 96 hrs Test substance: Product

NOEC Pimephales promelas (fathead minnow): 1,250 mg/l

Exposure time: 96 hrs Test substance: Product

NOEC Oncorhynchus mykiss (rainbow trout): 625 mg/l

Exposure time: 96 hrs Test substance: Product

Toxicity to daphnia and other

aquatic invertebrates

EC50 Daphnia magna (Water flea): 2,500 mg/l

Exposure time: 48 hrs Test substance: Product

NOEC Daphnia magna (Water flea): 1,250 mg/l

Exposure time: 48 hrs Test substance: Product

Persistence and degradability

The organic portion of this preparation is expected to be readily biodegradable.

Total Organic Carbon (TOC): 53,000 mg/l

Chemical Oxygen Demand (COD): 150,000 mg/l

Biochemical Oxygen Demand (BOD):

Incubation Period Value Test Descriptor

5 d 4,850 mg/l Product

Mobility

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.

If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air : <5% Water : 30 - 50% Soil : 50 - 70%

The portion in water is expected to be soluble or dispersible.

Bioaccumulative potential

This preparation or material is not expected to bioaccumulate.



3D TRASAR® 3DT288

Other information

no data available

Section: 13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it could meet the criteria of a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Before disposal, it should be determined if the waste meets the criteria of a hazardous waste.

Hazardous Waste: : D002

Disposal methods : Where possible recycling is preferred to disposal or

incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in an

approved waste disposal facility.

Disposal considerations : Dispose of as unused product. Empty containers should be

taken to an approved waste handling site for recycling or

disposal. Do not re-use empty containers.

Section: 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

Land transport (DOT)

Proper shipping name : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.

Technical name(s) : PHOSPHORIC ACID, SULFURIC ACID

UN/ID No. : UN 3264

Transport hazard class(es) : 8
Packing group : III

Air transport (IATA)

Proper shipping name : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.

Technical name(s) : PHOSPHORIC ACID, SULFURIC ACID

UN/ID No. : UN 3264

Transport hazard class(es) : 8
Packing group : III

Sea transport (IMDG/IMO)

Proper shipping name : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.

Technical name(s) : PHOSPHORIC ACID, SULFURIC ACID

UN/ID No. : UN 3264

Transport hazard class(es) : 8
Packing group : III



3D TRASAR® 3DT288

Section: 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Phosphoric Acid	7664-38-2	5000	67422

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Acute Health Hazard

SARA 302 : The following components are subject to reporting levels established

by SARA Title III, Section 302:

Hydrogen Peroxide 7722-84-1

SARA 313 : This material does not contain any chemical components with known

CAS numbers that exceed the threshold (De Minimis) reporting levels

established by SARA Title III, Section 313.

California Prop 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Methanol 67-56-1

INTERNATIONAL CHEMICAL CONTROL LAWS:

TOXIC SUBSTANCES CONTROL ACT (TSCA)

The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA)

The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

AUSTRALIA

All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

CHINA

All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on or exempt from the Inventory of Existing Chemical Substances China (IECSC).

JAPAN

All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

3D TRASAR® 3DT288

KOREA

All substances in this product comply with the Toxic Chemical Control Law (TCCL) and are listed on the Existing Chemicals List (ECL)

NEW ZEALAND

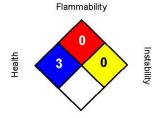
All substances in this product comply with the Hazardous Substances and New Organisms (HSNO) Act 1996, and are listed on or are exempt from the New Zealand Inventory of Chemicals.

PHILIPPINES

All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

Section: 16. OTHER INFORMATION

NFPA:



Special hazard.

HMIS III:



0 = not significant, 1 = Slight,

2 = Moderate, 3 = High

4 = Extreme, * = Chronic

Revision Date : 09/08/2015 Version Number : 1.2

Prepared By : Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. For additional copies of an SDS visit www.nalco.com and request access.



NALCO 2597



NALCO Water An Ecolab Company

SAFETY DATA SHEET

NALCO® 2597

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : NALCO® 2597

Other means of identification : SULFURIC ACID 66 DEG BE, ELECT

Recommended use : INDUSTRIAL WATER TREATMENT

Restrictions on use : Refer to available product literature or ask your local Sales Representative for

restrictions on use and dose limits.

Company : Nalco Company

1601 W. Diehl Road

Naperville, Illinois 60563-1198

USA

TEL: (630)305-1000

Emergency telephone

number

(800) 424-9300 (24 Hours) CHEMTREC

Issuing date : 07/05/2018

Section: 2. HAZARDS IDENTIFICATION

GHS Classification

Skin corrosion : Category 1A Serious eye damage : Category 1

GHS Label element

Hazard pictograms



Signal Word : Danger

Hazard Statements : Causes severe skin burns and eye damage.

Precautionary Statements : Prevention:

Wash skin thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Do not mix with bleach or other chlorinated

products - will cause chlorine gas.

Response:

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician. Wash contaminated

clothing before reuse. Storage: Store locked up. Disposal:



NALCO® 2597

Dispose of contents/ container to an approved waste disposal plant.

Other hazards : None known.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance/mixture : Mixture

Chemical Name CAS-No. Concentration: (%)

Sulfuric Acid 7664-93-9 60 - 100

Section: 4. FIRST AID MEASURES

In case of eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15

minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Get medical attention immediately.

In case of skin contact : Wash off immediately with plenty of water for at least 15 minutes. Use a mild

soap if available. Wash clothing before reuse. Thoroughly clean shoes before

reuse. Get medical attention immediately.

If swallowed : Rinse mouth with water. Do NOT induce vomiting. Never give anything by

mouth to an unconscious person. Get medical attention immediately.

If inhaled : Remove to fresh air. Treat symptomatically. Get medical attention if symptoms

occur.

Protection of first-aiders : In event of emergency assess the danger before taking action. Do not put

yourself at risk of injury. If in doubt, contact emergency responders. Use

personal protective equipment as required.

Notes to physician : Treat symptomatically.

Most important symptoms and effects, both acute and

delayed

See Section 11 for more detailed information on health effects and symptoms.

Section: 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the

surrounding environment.

Unsuitable extinguishing

media

None known.

Specific hazards during

firefighting

Will generate heat on contact with water.

Hazardous combustion

products

Decomposition products may include the following materials: Carbon oxides

nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus

Special protective equipment :

for firefighters

Use personal protective equipment.



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Specific extinguishing

methods

: Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. In the event of fire and/or explosion do not

breathe fumes

Section: 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Avoid inhalation, ingestion and contact with skin and eyes. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Ensure clean-up is conducted by trained personnel only. Refer to protective measures listed in sections 7 and 8.

Do not allow contact with soil, surface or ground water.

Methods and materials for containment and cleaning up

Environmental precautions

:

Stop leak if safe to do so. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Flush away traces with water.

Section: 7. HANDLING AND STORAGE

Advice on safe handling : Do not ingest. Do not breathe dust/fume/gas/mist/vapours/spray. Do not get in

eyes, on skin, or on clothing. Wash hands thoroughly after handling. Use only

with adequate ventilation.

Conditions for safe storage : Keep away from strong bases. Keep out of reach of children. Keep container

tightly closed. Store in suitable labelled containers.

Suitable material : Keep in properly labelled containers.

Unsuitable material : The following compatibility data is suggested based on similar product data

and/or industry experience: Product is corrosive to aluminum. Aluminum should

not be used for feed, storage, or transportation systems.

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Form of exposure	Permissible concentration	Basis
Sulfuric Acid	7664-93-9	TWA (Thoracic fraction)	0.2 mg/m3	ACGIH
		TWA	1 mg/m3	NIOSH REL
		TWA	1 mg/m3	OSHA Z1

Engineering measures : Effective exhaust ventilation system. Maintain air concentrations below

occupational exposure standards.

Personal protective equipment

Eye protection : Safety goggles

Face-shield

3/10

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



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Hand protection Wear the following personal protective equipment:

Standard glove type.

Gloves should be discarded and replaced if there is any indication of

degradation or chemical breakthrough.

Personal protective equipment comprising: suitable protective gloves, safety Skin protection

goggles and protective clothing

When workers are facing concentrations above the exposure limit they must use Respiratory protection

appropriate certified respirators.

Hygiene measures Handle in accordance with good industrial hygiene and safety practice. Remove

and wash contaminated clothing before re-use. Wash face, hands and any exposed skin thoroughly after handling. Provide suitable facilities for quick drenching or flushing of the eyes and body in case of contact or splash hazard.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

Liquid Appearance Colour Colorless Odour Pungent Flash point does not flash

pН < 1,(100 %), Method: ASTM E 70

Odour Threshold no data available Melting point/freezing point no data available Initial boiling point and boiling : 276 °C, (760 mm Hg)

range

Evaporation rate no data available Flammability (solid, gas) no data available Upper explosion limit no data available Lower explosion limit no data available < 1 mm Hg, (37.8 °C), Vapour pressure no data available Relative vapour density

Relative density

Density 1.8 g/cm3, 15 lb/gal Water solubility completely soluble Solubility in other solvents no data available Partition coefficient: nno data available

octanol/water

no data available no data available

Auto-ignition temperature Thermal decomposition Viscosity, dynamic no data available



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Viscosity, kinematic no data available Molecular weight no data available VOC no data available

Section: 10. STABILITY AND REACTIVITY

Stable under normal conditions. Chemical stability

Possibility of hazardous

reactions

No dangerous reaction known under conditions of normal use.

Conditions to avoid High temperatures

and sources of ignition including static discharges.

Incompatible materials None known.

Hazardous decomposition

products

Decomposition products may include the following materials:

Carbon oxides nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus

Section: 11. TOXICOLOGICAL INFORMATION

exposure

Information on likely routes of : Inhalation, Eye contact, Skin contact

Potential Health Effects

Eyes Causes serious eye damage.

Skin Causes severe skin burns. Ingestion Causes digestive tract burns.

Inhalation May cause nose, throat, and lung irritation.

Chronic Exposure Health injuries are not known or expected under normal use.

Experience with human exposure

Eye contact Redness, Pain, Corrosion

Skin contact Redness, Pain, Corrosion

Ingestion Corrosion, Abdominal pain

Inhalation Respiratory irritation, Cough

Toxicity

Product



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Acute oral toxicity : no data available

Acute inhalation toxicity : mouse: 0.226 mg/l

Exposure time: 4 hrs Test substance: Similar Product

Acute dermal toxicity : no data available
Skin corrosion/irritation : no data available
Serious eye damage/eye : no data available

irritation

Respiratory or skin

sensitization

no data available

Carcinogenicity

IARC Group 1: Carcinogenic to humans

Sulfuric Acid 7664-93-9

OSHA No component of this product present at levels greater than or equal to 0.1% is

on OSHA's list of regulated carcinogens.

NTP Known to be human carcinogen

Sulfuric Acid 7664-93-9

Reproductive effects : no data available
Germ cell mutagenicity : no data available
Teratogenicity : no data available
STOT - single exposure : no data available
STOT - repeated exposure : no data available
Aspiration toxicity : no data available

Section: 12. ECOLOGICAL INFORMATION

Ecotoxicity

Environmental Effects : Harmful to aquatic life.

Product

Toxicity to fish : LC50 Inland Silverside: > 5,000 mg/l

Exposure time: 96 hrs Test substance: Product

LC50 Rainbow Trout: > 5,000 mg/l

Exposure time: 96 hrs Test substance: Product

NOEC Inland Silverside: 5,000 mg/l

Exposure time: 96 hrs Test substance: Product

NOEC Rainbow Trout: 5,000 mg/l

Exposure time: 96 hrs

NALCO® 2597

Test substance: Product

LC50 Fathead Minnow: 7,175 mg/l

Exposure time: 96 hrs Test substance: Product

NOEC Fathead Minnow: 3,600 mg/l

Exposure time: 96 hrs Test substance: Product

LC50 Fathead Minnow: 7,746 mg/l

Exposure time: 48 hrs Test substance: Product

NOEC Fathead Minnow: 6,000 mg/l

Exposure time: 48 hrs Test substance: Product

Toxicity to daphnia and other aquatic invertebrates

LC50 Mysid Shrimp (Mysidopsis bahia): > 5,000 mg/l

Exposure time: 96 hrs Test substance: Product

EC50 Ceriodaphnia dubia: 1,830 mg/l

Exposure time: 48 hrs Test substance: Product

NOEC Mysid Shrimp (Mysidopsis bahia): 5,000 mg/l

Exposure time: 96 hrs Test substance: Product

NOEC Ceriodaphnia dubia: 1,250 mg/l

Exposure time: 48 hrs Test substance: Product

Persistence and degradability

no data available

Mobility

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.

If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air : <5% Water : 30 - 50% Soil : 50 - 70%

Bioaccumulative potential

no data available



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Other information

no data available

Section: 13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it could meet the criteria of a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Before disposal, it should be determined if the waste meets the criteria of a hazardous waste.

Hazardous Waste: : D002

Disposal methods : The product should not be allowed to enter drains, water

courses or the soil. Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in

an approved waste disposal facility.

Disposal considerations : Dispose of as unused product. Empty containers should be

taken to an approved waste handling site for recycling or

disposal. Do not re-use empty containers.

Section: 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

The presence of an RQ component (Reportable Quantity for U.S. DOT) in this product causes it to be regulated with an additional description of RQ for road, or as Environmentally hazardous for road and air, ONLY when the net weight in the package exceeds the calculated RQ for the product.

Land transport (DOT)

Proper shipping name : SULFURIC ACID WITH MORE THAN 51% ACID

Technical name(s)

UN/ID No. : UN 1830
Transport hazard class(es) : 8
Packing group : II

Reportable Quantity (per : 1,047 lbs

package)

RQ Component : SULFURIC ACID

Air transport (IATA)

Proper shipping name : SULPHURIC ACID WITH MORE THAN 51% ACID

Technical name(s)

UN/ID No. : UN 1830
Transport hazard class(es) : 8
Packing group : II
Reportable Quantity (per : 1,047 lbs

package)

RQ Component : SULFURIC ACID

Sea transport (IMDG/IMO)



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SULFURIC ACID WITH MORE THAN 51% ACID Proper shipping name

Technical name(s)

UN 1830

UN/ID No. Transport hazard class(es)

8 Packing group 11

Section: 15. REGULATORY INFORMATION

TSCA list : Not relevant

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Sulfuric Acid	7664-93-9	1000	107

SARA 304 Extremely Hazardous Substances Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Sulfuric Acid	7664-93-9	1000	1073

SARA 311/312 Hazards : Acute Health Hazard

SARA 302 The following components are subject to reporting levels established

by SARA Title III, Section 302:

Sulfuric Acid

SARA 313 : The following components are subject to reporting levels established

by SARA Title III, Section 313:

Sulfuric Acid 7664-93-9 60 - 100 %

California Prop 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

WARNING! This product contains a chemical known to the State of California to cause cancer.

Sulfuric Acid 7664-93-9

INTERNATIONAL CHEMICAL CONTROL LAWS:

United States TSCA Inventory

The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

Australia. Industrial Chemical (Notification and Assessment) Act

All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

NALCO® 2597

Canadian Domestic Substances List (DSL)

The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

Japan. ENCS - Existing and New Chemical Substances Inventory

All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

Korea. Korean Existing Chemicals Inventory (KECI)

All substances in this product comply with the Chemical Control Act (CCA) and are listed on the Existing Chemicals List (ECL)

Philippines Inventory of Chemicals and Chemical Substances (PICCS)

All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

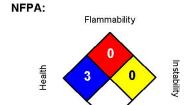
China Inventory of Existing Chemical Substances

All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on or exempt from the Inventory of Existing Chemical Substances China (IECSC).

Taiwan Chemical Substance Inventory

All substances in this product comply with the Taiwan Existing Chemical Substances Inventory (ECSI).

Section: 16. OTHER INFORMATION



Special hazard.

HMIS III:



0 = not significant, 1 =Slight, 2 = Moderate, 3 = High

4 = Extreme, * = Chronic

Revision Date : 07/05/2018

Version Number : 1.2

Prepared By : Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. For additional copies of an SDS visit www.nalco.com and request access.



NALCO 7408



NALCO Water An Ecolab Company

Other means of identification

SAFETY DATA SHEET

NALCO® 7408

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : NALCO® 7408

Recommended use : CHLORINE SCAVENGER

Restrictions on use : Refer to available product literature or ask your local Sales Representative for

restrictions on use and dose limits.

Company : Nalco Company

1601 W. Diehl Road

Not applicable.

Naperville, Illinois 60563-1198

USA

TEL: (630)305-1000

Emergency telephone

number

(800) 424-9300 (24 Hours) CHEMTREC

Issuing date : 08/16/2017

Section: 2. HAZARDS IDENTIFICATION

GHS Classification

Acute toxicity (Oral) : Category 4

GHS Label element

Hazard pictograms :



Signal Word : Warning

Hazard Statements : Harmful if swallowed.

Precautionary Statements : Prevention:

Wash skin thoroughly after handling. Do not eat, drink or smoke when using this

product. Response:

IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel

unwell. Rinse mouth.

Storage:

Protect product from freezing.

Disposal:

Dispose of contents/ container to an approved waste disposal plant.

Other hazards : The head space of containers containing this product may accumulate Sulphur

Dioxide (SO2). SO2 is a toxic and irritating gas that can be hazardous if inhaled.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS



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Chemical Name CAS-No. Concentration: (%)

Sodium Bisulfite 7631-90-5 30 - 60

Section: 4. FIRST AID MEASURES

In case of eye contact : Rinse with plenty of water. Get medical attention if symptoms occur.

In case of skin contact : Wash off with soap and plenty of water. Get medical attention if symptoms

occur.

If swallowed : Rinse mouth. Get medical attention if symptoms occur.

If inhaled : Get medical attention if symptoms occur.

Protection of first-aiders : In event of emergency assess the danger before taking action. Do not put

yourself at risk of injury. If in doubt, contact emergency responders. Use

personal protective equipment as required.

Notes to physician : Treat symptomatically.

Most important symptoms and effects, both acute and

delayed

See Section 11 for more detailed information on health effects and symptoms.

Section: 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the

surrounding environment.

Unsuitable extinguishing

media

None known.

Specific hazards during

firefighting

Heating or fire can release toxic gas.

May evolve oxides of sulfur (SOx) under fire conditions.

Hazardous combustion

products

Decomposition products may include the following materials: Carbon oxides

nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus

Special protective equipment :

for firefighters

Use personal protective equipment.

Specific extinguishing

methods

Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. In the event of fire and/or explosion do not

breathe fumes.

Section: 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures Ensure clean-up is conducted by trained personnel only. Refer to protective

measures listed in sections 7 and 8.

Environmental precautions : Do not allow contact with soil, surface or ground water.

Methods and materials for : Stop leak if safe to do so. Contain spillage, and then collect with non-



NALCO® 7408

containment and cleaning up

combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Flush away traces with water.

Section: 7. HANDLING AND STORAGE

Advice on safe handling : Do not ingest. Wash hands thoroughly after handling. Use only with adequate

ventilation. Containers should be opened cautiously and only in well ventilated

areas.

Conditions for safe storage : Keep out of reach of children. Keep container tightly closed. Store in a well-

ventilated place. Store in suitable labelled containers. Do not store at elevated

temperature.

Suitable material : Keep in properly labelled containers.

Unsuitable material : not determined

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.		Permissible concentration	Basis
Sodium Bisulfite	7631-90-5	TWA	5 mg/m3	ACGIH
		TWA	5 mg/m3	NIOSH REL

Engineering measures : Effective exhaust ventilation system. Maintain air concentrations below

occupational exposure standards.

Personal protective equipment

Eye protection : Safety glasses

Hand protection : Wear protective gloves.

Gloves should be discarded and replaced if there is any indication of

degradation or chemical breakthrough.

Skin protection : Wear suitable protective clothing.

Respiratory protection : When workers are facing concentrations above the exposure limit they must use

appropriate certified respirators.

When workers are facing concentrations above the exposure limit they must use

appropriate certified respirators.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. Remove

and wash contaminated clothing before re-use. Wash face, hands and any

exposed skin thoroughly after handling.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES



NALCO® 7408

Appearance Liquid Colour clear Odour **Pungent** Flash point does not flash no data available рН Odour Threshold no data available

FREEZING POINT: 1.1 °C Melting point/freezing point

Initial boiling point and boiling :

range

104 °C

Evaporation rate no data available Flammability (solid, gas) no data available Upper explosion limit no data available Lower explosion limit no data available

Vapour pressure 32 mm Hg, (25 °C), ASTM D 323,

Relative vapour density 2.2(Air = 1)

Relative density 1.37, (25 °C), ASTM D-1298

Density 11.4 lb/gal

Water solubility completely soluble Solubility in other solvents no data available Partition coefficient: nno data available

octanol/water

Auto-ignition temperature no data available no data available Thermal decomposition Viscosity, dynamic 2.8 mPa.s (25 °C) Viscosity, kinematic no data available Molecular weight no data available VOC no data available

Section: 10. STABILITY AND REACTIVITY

Chemical stability Evolves SO2 when open to atmosphere. The rate of SO2 evolution increases

with temperature and/or transfer of product.

Possibility of hazardous

reactions

No dangerous reaction known under conditions of normal use.

Conditions to avoid Keep away from heat and sources of ignition.

Incompatible materials Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid,

perchlorate, concentrated oxygen, permanganate) may generate heat, fires,

explosions and/or toxic vapors.

Contact with strong acids (e.g. sulfuric, phosphoric, nitric, hydrochloric, chromic,

NALCO® 7408

sulfonic) may generate heat, splattering or boiling and toxic vapors.

SO2 may react with vapors from neutralizing amines and may produce a visible

cloud of amine salt particles.

Mild steel Aluminium

Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors.

Contact with strong acids (e.g. sulfuric, phosphoric, nitric, hydrochloric, chromic, sulfonic) may generate heat, splattering or boiling and toxic vapors.

Evolves sulfur dioxide (SO2) when open to atmosphere. The rate of SO2 evolution increases with temperature and/or transfer of product.

Sulfur dioxide may react with vapors from neutralizing amines and may form a

visible cloud of amine salt particles.

SO2 may react with vapors from neutralizing amines and may produce a visible

cloud of amine salt particles.

Hazardous decomposition products

Decomposition products may include the following materials:

Carbon oxides

nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus

Section: 11. TOXICOLOGICAL INFORMATION

exposure

Information on likely routes of : Inhalation, Eye contact, Skin contact

Potential Health Effects

Eyes Health injuries are not known or expected under normal use.

Skin Health injuries are not known or expected under normal use.

Harmful if swallowed. Ingestion

Inhalation May release toxic, irritating and/or corrosive gases.

Chronic Exposure Health injuries are not known or expected under normal use.

Experience with human exposure

Eye contact No symptoms known or expected

Skin contact No symptoms known or expected.

Ingestion No information available.

Inhalation : No symptoms known or expected.

Toxicity

Product



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Acute oral toxicity LD50 rat: 500 mg/kg

Test substance: Similar Product

Acute inhalation toxicity no data available LD50 rabbit: Acute dermal toxicity

Test substance: Similar Product

Skin corrosion/irritation Species: Rabbit

> Result: 1.0 Method: Draize Test

Test substance: Similar Product

Serious eye damage/eye

irritation

Species: rabbit Result: 9.4

Method: Draize Test

Test substance: Similar Product

Respiratory or skin

sensitization

Result: Contains an ingredient that can cause asthmatic-like reactions in sulfite-

sensitive individuals.

Carcinogenicity no data available Reproductive effects no data available Germ cell mutagenicity no data available Teratogenicity no data available STOT - single exposure no data available STOT - repeated exposure no data available Aspiration toxicity no data available

Section: 12. ECOLOGICAL INFORMATION

Ecotoxicity

Environmental Effects This product has no known ecotoxicological effects.

Product

Toxicity to fish : LC50 Oncorhynchus mykiss (rainbow trout): > 100 mg/l

Exposure time: 96 hrs Test substance: Product

LC50 Pimephales promelas (fathead minnow): 382 mg/l

Exposure time: 96 hrs

Test substance: Similar Product

LC50 Gambusia affinis (Mosquito fish): 240 mg/l

Exposure time: 96 hrs

Test substance: Active Substance

NOEC Pimephales promelas (fathead minnow): 250 mg/l

Exposure time: 96 hrs

Test substance: Similar Product

Toxicity to daphnia and other

aquatic invertebrates

LC50 Daphnia magna (Water flea): 728 mg/l

Exposure time: 48 hrs

NALCO® 7408

Test substance: Similar Product

LC50 Daphnia magna (Water flea): 275 mg/l

Exposure time: 48 hrs Test substance: Product

LC50 Daphnia magna (Water flea): 119 mg/l

Exposure time: 48 hrs

Test substance: Active Substance

NOEC Daphnia magna (Water flea): 250 mg/l

Exposure time: 48 hrs

Test substance: Similar Product

Toxicity to fish (Chronic

toxicity)

: EC25 / IC25: 382 mg/l Exposure time: 7 Days Species: Fathead Minnow Test substance: Product

LOEC: 500 mg/l Exposure time: 7 Days Species: Fathead Minnow Test substance: Product

NOEC: 250 mg/l Exposure time: 7 Days Species: Fathead Minnow Test substance: Product

Toxicity to daphnia and other aquatic invertebrates

(Chronic toxicity)

LOEC: 500 mg/l Exposure time: 7 Days Species: Ceriodaphnia dubia Test substance: Product Test Type: 3 Brood

EC25 / IC25: 277 mg/l Exposure time: 7 Days Species: Ceriodaphnia dubia Test substance: Product

Test Type: 3 Brood

NOEC: 250 mg/l Exposure time: 7 Days Species: Ceriodaphnia dubia Test substance: Product Test Type: 3 Brood

Persistence and degradability

Greater than 95% of this product consists of inorganic substances for which a biodegradation value is not applicable.

Chemical Oxygen Demand (COD): 85,000 mg/l

Mobility



NALCO® 7408

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.

If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air : <5% Water : 30 - 50% Soil : 50 - 70%

The portion in water is expected to be soluble or dispersible.

Bioaccumulative potential

This preparation or material is not expected to bioaccumulate.

Other information

no data available

Section: 13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it is not a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

Disposal methods : Where possible recycling is preferred to disposal or

incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in an

approved waste disposal facility.

Disposal considerations : Dispose of as unused product. Empty containers should be

taken to an approved waste handling site for recycling or

disposal. Do not re-use empty containers.

Section: 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

The presence of an RQ component (Reportable Quantity for U.S. DOT) in this product causes it to be regulated with an additional description of RQ for road, or as Environmentally hazardous for road and air, ONLY when the net weight in the package exceeds the calculated RQ for the product.

Land transport (DOT)

Proper shipping name : BISULPHITES, AQUEOUS SOLUTION, N.O.S.

Technical name(s) : SODIUM BISULPHITE

UN/ID No. : UN 2693 Transport hazard class(es) : 8

Packing group : III

Reportable Quantity (per : 12,500 lbs package)

RQ Component : SODIUM BISULFITE



NALCO® 7408

Air transport (IATA)

Proper shipping name : BISULPHITES, AQUEOUS SOLUTION, N.O.S.

Technical name(s) : SODIUM BISULFITE

UN/ID No. : UN 2693 Transport hazard class(es) : 8 Packing group : III

Packing group : III
Reportable Quantity (per : 12,500 lbs

package)

RQ Component : SODIUM BISULFITE

Sea transport (IMDG/IMO)

Proper shipping name : BISULPHITES, AQUEOUS SOLUTION, N.O.S.

Technical name(s) : SODIUM BISULPHITE

UN/ID No. : UN 2693 Transport hazard class(es) : 8

Packing group : III

Section: 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Sodium Bisulfite	7631-90-5	5000	12500

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Acute Health Hazard

SARA 302 : No chemicals in this material are subject to the reporting requirements

of SARA Title III, Section 302.

SARA 313 : This material does not contain any chemical components with known

CAS numbers that exceed the threshold (De Minimis) reporting levels

established by SARA Title III, Section 313.

California Prop 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

INTERNATIONAL CHEMICAL CONTROL LAWS:

United States TSCA Inventory

The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

Australia. Industrial Chemical (Notification and Assessment) Act

All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

NALCO® 7408

Canadian Domestic Substances List (DSL)

The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

Japan. ENCS - Existing and New Chemical Substances Inventory

All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

Korea. Korean Existing Chemicals Inventory (KECI)

All substances in this product comply with the Chemical Control Act (CCA) and are listed on the Existing Chemicals List (ECL)

Philippines Inventory of Chemicals and Chemical Substances (PICCS)

All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

China Inventory of Existing Chemical Substances

All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on or exempt from the Inventory of Existing Chemical Substances China (IECSC).

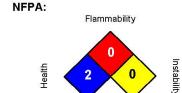
New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand

All substances in this product comply with the Hazardous Substances and New Organisms (HSNO) Act 1996, and are listed on or are exempt from the New Zealand Inventory of Chemicals.

Taiwan Chemical Substance Inventory

All substances in this product comply with the Taiwan Existing Chemical Substances Inventory (ECSI).

Section: 16. OTHER INFORMATION



Special hazard.

HMIS III:



0 = not significant, 1 = Slight,

2 = Moderate, 3 = High

4 = Extreme, * = Chronic

Revision Date : 08/16/2017

Version Number : 2.0

Prepared By : Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use,



NALCO® 7408

processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. For additional copies of an SDS visit www.nalco.com and request access.



NALCO 90005



NALCO Water

SAFETY DATA SHEET

NALCO® 90005

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : NALCO® 90005

Other means of identification : Not applicable.

Restrictions on use : Refer to available product literature or ask your local Sales Representative for

restrictions on use and dose limits.

Company : Nalco Company

1601 W. Diehl Road

Naperville, Illinois 60563-1198

USA

TEL: (630)305-1000

Emergency telephone

number

(800) 424-9300 (24 Hours) CHEMTREC

Issuing date : 07/27/2018

Section: 2. HAZARDS IDENTIFICATION

GHS Classification

Acute toxicity (Oral) : Category 3
Acute toxicity (Inhalation) : Category 3
Acute toxicity (Dermal) : Category 4
Skin corrosion : Category 1B
Serious eye damage : Category 1

GHS Label element

Hazard pictograms





Signal Word : Danger

Hazard Statements : Toxic if swallowed or if inhaled

Harmful in contact with skin.

Causes severe skin burns and eye damage.

Precautionary Statements : Prevention:

Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray. Wash skin thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Wear protective gloves/ protective clothing/

eye protection/ face protection.

Response:

IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.



NALCO® 90005

Immediately call a POISON CENTER or doctor/ physician. Wash contaminated

clothing before reuse.

Storage:

Store in a well-ventilated place. Keep container tightly closed. Store locked up.

Disposal:

Dispose of contents/ container to an approved waste disposal plant.

Other hazards : None known.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance/mixture : Mixture

Chemical Name CAS-No. Concentration: (%)

Dimethyl-Dioctyl-Ammonium Chloride 5538-94-3 50 Glycerol 56-81-5 5 - 10

Section: 4. FIRST AID MEASURES

In case of eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15

minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Get medical attention immediately.

In case of skin contact : Wash off immediately with plenty of water for at least 15 minutes. Use a mild

soap if available. Wash clothing before reuse. Thoroughly clean shoes before

reuse. Get medical attention immediately.

If swallowed : Rinse mouth with water. Do NOT induce vomiting, Never give anything by

mouth to an unconscious person. Get medical attention immediately.

If inhaled : Remove to fresh air. Treat symptomatically. Get medical attention immediately.

Protection of first-aiders : In event of emergency assess the danger before taking action. Do not put

irst-aiders : In event of emergency assess the danger before taking action. Do not put yourself at risk of injury. If in doubt, contact emergency responders. Use

personal protective equipment as required.

Notes to physician : Treat symptomatically.

Most important symptoms and effects, both acute and

delayed

See Section 11 for more detailed information on health effects and symptoms.

Section: 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the

surrounding environment.

Unsuitable extinguishing

media

None known.

Specific hazards during

firefighting

: Not flammable or combustible.

Hazardous combustion : Decomposition products may include the following materials: Carbon oxides



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products nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus

Special protective equipment :

for firefighters

Use personal protective equipment.

Specific extinguishing

methods

Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. In the event of fire and/or explosion do not

breathe fumes.

Section: 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Avoid inhalation, ingestion and contact with skin and eyes. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Ensure clean-up is conducted by trained personnel only. Refer to protective measures listed in sections 7 and 8.

Environmental precautions

Do not allow contact with soil, surface or ground water.

Methods and materials for containment and cleaning up

Stop leak if safe to do so. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Flush away traces with water.

Section: 7. HANDLING AND STORAGE

Advice on safe handling : Do not ingest. Do not breathe dust/fume/gas/mist/vapours/spray. Do not get in

eyes, on skin, or on clothing. Wash hands thoroughly after handling. Use only

with adequate ventilation.

Conditions for safe storage : Keep out of reach of children. Keep container tightly closed. Store in suitable

labelled containers.

Suitable material : The following compatibility data is suggested based on similar product data

and/or industry experience: Compatibility with Plastic Materials can vary; we

therefore recommend that compatibility is tested prior to use.

Unsuitable material : not determined

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Form of exposure	Permissible concentration	Basis
Glycerol	56-81-5	TWA	10 mg/m3	ACGIH
		TWA (mist, respirable fraction)	5 mg/m3	OSHA Z1
		TWA (mist, total dust)	15 mg/m3	OSHA Z1

Engineering measures : Effective exhaust ventilation system. Maintain air concentrations below

3/10

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



NALCO® 90005

occupational exposure standards.

Personal protective equipment

Eye protection : Safety goggles

Face-shield

Hand protection : Wear the following personal protective equipment:

Standard glove type.

Gloves should be discarded and replaced if there is any indication of

degradation or chemical breakthrough.

Skin protection : Personal protective equipment comprising: suitable protective gloves, safety

goggles and protective clothing

Respiratory protection : When workers are facing concentrations above the exposure limit they must use

appropriate certified respirators.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. Remove

and wash contaminated clothing before re-use. Wash face, hands and any exposed skin thoroughly after handling. Provide suitable facilities for quick drenching or flushing of the eyes and body in case of contact or splash hazard.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid

Colour : Clear Colorless - Light yellow

Odour : Alcoholic

Flash point : > 93.3 °C, Method: Seta closed cup

pH : 6.5 - 9.0,(10 %)
Odour Threshold : no data available

Melting point/freezing point : MELTING POINT: -12 °C

Initial boiling point and boiling:

range

95.0 °C

Evaporation rate no data available Flammability (solid, gas) no data available Upper explosion limit no data available Lower explosion limit no data available Vapour pressure no data available Relative vapour density no data available 0.96, (25.0 °C), Relative density Density 8.0 lb/gal

Water solubility : completely soluble
Solubility in other solvents : no data available
Partition coefficient: n- : no data available



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octanol/water

Auto-ignition temperature no data available Thermal decomposition no data available Viscosity, dynamic 100 mPa.s (25 °C) Viscosity, kinematic no data available Molecular weight no data available VOC 0 %, EPA Method 24

Section: 10. STABILITY AND REACTIVITY

Chemical stability Stable under normal conditions.

Possibility of hazardous

reactions

No dangerous reaction known under conditions of normal use.

Conditions to avoid Extremes of temperature

Incompatible materials Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid,

perchlorate, concentrated oxygen, permanganate) may generate heat, fires,

explosions and/or toxic vapors.

Reducing agents

Hazardous decomposition

products

exposure

Decomposition products may include the following materials:

Carbon oxides nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus

Section: 11. TOXICOLOGICAL INFORMATION

Information on likely routes of : Inhalation, Eye contact, Skin contact

Potential Health Effects

Eyes Causes serious eye damage.

Skin Harmful in contact with skin. Causes severe skin burns.

Toxic if swallowed. Causes digestive tract burns. Ingestion

Inhalation Toxic if inhaled. May cause nose, throat, and lung irritation.

Chronic Exposure Health injuries are not known or expected under normal use.

Experience with human exposure

Eye contact Redness, Pain, Corrosion

Skin contact Redness, Pain, Corrosion



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Ingestion : Corrosion, Abdominal pain

Inhalation : Respiratory irritation, Cough

Toxicity

Product

Acute oral toxicity : no data available
Acute inhalation toxicity : no data available
Acute dermal toxicity : no data available
Skin corrosion/irritation : Species: Rabbit
Serious eye damage/eye : Species: rabbit

irritation

Respiratory or skin

sensitization

no data available

Carcinogenicity : no data available
Reproductive effects : no data available
Germ cell mutagenicity : no data available

Teratogenicity : No evidence of developmental or fetotoxic effects observed at exposure doses

ranging from 10 to 50 mg/kg/day from day 6 through 15 of gestation.

STOT - single exposure : no data available STOT - repeated exposure : no data available Aspiration toxicity : no data available

Components

Acute oral toxicity : Dimethyl-Dioctyl-Ammonium Chloride

LD50 rat: 238 mg/kg

Glycerol

LD50 rat: 18,300 mg/kg

Components

Acute inhalation toxicity : Dimethyl-Dioctyl-Ammonium Chloride

LC50 rat: 0.07 mg/l Exposure time: 4 h Test atmosphere: dust/mist

Components

Acute dermal toxicity : Dimethyl-Dioctyl-Ammonium Chloride

LD50 rabbit: 2,930 mg/kg

Glycerol

LD50 rabbit: 23,000 mg/kg

Section: 12. ECOLOGICAL INFORMATION

Ecotoxicity

Environmental Effects : Very toxic to aquatic life.

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Product

: LC50 Rainbow Trout: 0.7 mg/l Toxicity to fish

> Exposure time: 96 hrs Test substance: Product

LC50 Bluegill Sunfish: 0.1 mg/l Exposure time: 48 hrs Test substance: Product

LC50 Fathead Minnow: 5.0 mg/l Exposure time: 48 hrs Test substance: Product

NOEC Fathead Minnow: 2.5 mg/l

Exposure time: 48 hrs Test substance: Product

Toxicity to daphnia and other

aquatic invertebrates

LC50 Daphnia magna: 0.1 mg/l

Exposure time: 48 hrs Test substance: Product

LC50 Ceriodaphnia dubia: 0.79 mg/l

Exposure time: 48 hrs Test substance: Product

EC50 Ceriodaphnia dubia: 0.76 mg/l

Exposure time: 48 hrs Test substance: Product

NOEC Ceriodaphnia dubia: 0.31 mg/l

Exposure time: 48 hrs Test substance: Product

Toxicity to terrestrial

organisms

: LC50 Mallard Duck: 240 mg/kg

Test substance: Product

LC50 Bobwhite Quail: 2,625 mg/kg

Exposure time: 8 Days Test substance: Product

Persistence and degradability

Total Organic Carbon (TOC): 410,000 mg/l

Chemical Oxygen Demand (COD): 1,100,000 mg/l

Mobility

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.



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If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air : <5% Water : 10 - 30% Soil : 10 - 30%

The portion in water is expected to be soluble or dispersible.

Bioaccumulative potential

This preparation or material is not expected to bioaccumulate.

Other information

no data available

Section: 13. DISPOSAL CONSIDERATIONS

Disposal methods : The product should not be allowed to enter drains, water

courses or the soil. Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in

an approved waste disposal facility.

Disposal considerations : Dispose of as unused product. Empty containers should be

taken to an approved waste handling site for recycling or

disposal. Do not re-use empty containers.

Section: 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

Land transport (DOT)

Proper shipping name : DISINFECTANTS, LIQUID, CORROSIVE, N.O.S. Technical name(s) : QUATERNARY AMMONIUM CHLORIDE(S)

UN/ID No. : UN 1903

Transport hazard class(es) : 8 Packing group : II

Air transport (IATA)

Proper shipping name : DISINFECTANTS, LIQUID, CORROSIVE, N.O.S. Technical name(s) : QUATERNARY AMMONIUM CHLORIDE(S)

UN/ID No. : UN 1903

Transport hazard class(es) : 8
Packing group : II

Sea transport (IMDG/IMO)

Proper shipping name : DISINFECTANTS, LIQUID, CORROSIVE, N.O.S. Technical name(s) : QUATERNARY AMMONIUM CHLORIDE(S)

UN/ID No. : UN 1903

Transport hazard class(es) : 8



NALCO® 90005

Packing group : II

Section: 15. REGULATORY INFORMATION

TSCA list : Not relevant

EPA Reg. No. : 6836-60-1706

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

This product does not contain a RQ substance, or this product contains a substance with a RQ, however the calculated RQ exceeds the reasonably attainable upper limit.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Acute Health Hazard

SARA 302 : No chemicals in this material are subject to the reporting requirements

of SARA Title III, Section 302.

SARA 313 : This material does not contain any chemical components with known

CAS numbers that exceed the threshold (De Minimis) reporting levels

established by SARA Title III, Section 313.

California Prop 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

INTERNATIONAL CHEMICAL CONTROL LAWS:

United States TSCA Inventory

This product is exempted under TSCA and regulated under FIFRA. The inerts are on the Inventory List.

Canadian Domestic Substances List (DSL)

The substances in this preparation are listed on the Domestic Substances List (DSL), are exempt, or have been reported in accordance with the New Substances Notification Regulations.

Taiwan Chemical Substance Inventory

All substances in this product comply with the Taiwan Existing Chemical Substances Inventory (ECSI).

Section: 16. OTHER INFORMATION

NALCO® 90005

NFPA: Flammability

Special hazard.

HMIS III:



0 = not significant, 1 =Slight, 2 = Moderate, 3 = High 4 = Extreme, * = Chronic

Revision Date : 07/27/2018 Version Number 1.2

Prepared By : Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. For additional copies of an SDS visit www.nalco.com and request access.



NORWECO Inc. Enviro-C



norweco[®]

SAFETY DATA SHEET ENVIRO-C® DECHLORINATION TABLETS

EMERGENCY TELEPHONE: (800) 424-9300 DATE PREPARED: JANUARY 2018

PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME Enviro-C CHEMICAL NAME
CHEMICAL ABSTRACT SERVICE NO. Ascorbic Acid Tablets CAS #50-81-7 CHEMICAL FAMILY Organic Acid C H O FORMULA SUPPLIER Norweco, Inc. 220 Republic St

Norwalk, OH USA 44857 (800) 424-9300 EMERGENCY TELEPHONE NUMBER

TECHNICAL PHONE NUMBER (800) NORWECO, (800) 667-9326

HAZARDOUS IDENTIFICATION

EMERGENCY OVERVIEW May cause irritation to eyes, skin and respiratory system on contact. Ingestion may irritate gastrointestinal tract. Ingestion of small amounts is not likely to produce harmful effects. Chronic ingestion of large quantities may cause gastrointestinal effects including nausea, diarrhea, urine

acidification, oxalate and uric crystallization in the bladder and kidneys, decreased reaction times, psychomotor coordination

POTENTIAL ACUTE HEALTH EFFECTS

Inhalation may irritate the nose, throat and upper respiratory tract. INHALATION

INGESTION Ingestion of small amounts is not likely to produce harmful effects. Chronic ingestion of large quantities may cause gastrointestinal effects including nausea, diarrhea, urine acidification, oxalate and uric crystallization in the bladder and kidneys, decreased reaction times, psychomotor coordination

SKIN May cause skin irritation.

EYES May irritate eyes OVER EXPOSURE SIGNS/SYMPTOMS

INHALATION

Adverse symptoms may include the following: nose, throat and respiratory tract irritation INGESTION Adverse symptoms may include the following:

gastrointestinal tract irritation

a large quantities may cause gastrointestinal effects including nausea, diarrhea, urine acidification, oxalate and uric crystallization in the bladder

and kidneys, decreased reaction times, psychomotor coordination

Adverse symptoms may include the following: SKIN irritation

Adverse symptoms may include the following EYES

MEDICAL CONDITIONS AGGRAVATED Not available BY OVEREXPOSURE

CONSUMPTION/INFORMATION ON INGREDIENTS

ASCORBIC ACID INERT INGREDIENTS

THERE ARE NO ADDITIONAL INGREDIENTS PRESENT, WITHIN THE CURRENT KNOWLEDGE OF THE SUPPLIER AND IN THE CONCENTRATIONS APPLICABLE THAT ARE CLASSIFIED AS HAZARDOUS TO HEALTH OR THE ENVIRONMENT AND HENCE REQUIRE REPORTING IN THIS SECTION.

FIRST AID PROCEDURES

If ingestion, irritation, any type of overexposure or symptoms of overexposure occur during or persists after use of this product, contact a POISON CONTROL CENTER, EMERGENCY ROOM OR

PHYSICIAN immediately, have Safety Data Sheet information available. Never give anything by mouth to an unconscious or convulsing person

EYE CONTACT Flush eyes with plenty of water. If irritation persists, seek medical attention. SKIN CONTACT INHALATION Wash with soap and water. Seek medical attention if irritation develops

Remove to fresh air.

INGESTION

Do not induce vomiting, Rinse mouth. If adverse symptoms develop, seek medical attention.

No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested. NOTE TO PHYSICIAN

FIRE-FIGHTING MEASURES

FLAMMABILITY OF THE PRODUCT Not available EXTINGUISHING MEDIA

SUITABLE Use any fire fighting agent appropriate for surrounding material; use water spray, carbon dioxide, dry chemical or foam.

NOT SUITABLE SPECIAL EXPOSURE HAZARDS As with most organic solids, combustion is possible at elevated temperatures

HAZARDOUS COMBUSTION PRODUCTS

SPECIAL FIREFIGHTING PROCEDURES Use water to cool nearby containers and structures. Wear full protective equipment, including suitable respiratory protection

ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS Wear appropriate personal protective equipment if required

ENVIRONMENTAL PRECAUTIONS

LARGE SPILL Sweep or scoop into clean, dry disposal container. Flush spill area with water Sweep or scoop into clean, dry disposal container. Flush spill area with water SMALL SPILL REFERENCE TO OTHER SECTIONS See Section I for emergency contact information.
See Section VIII for information on appropriate personal protective equipment.

See Section XIII for additional waste treatment information

HANDLING AND STORAGE

HANDLING Use proper equipment for lifting and transporting all containers. Use sensible industrial hygiene and housekeeping practices. Use caution in

handling spilled material. Put on appropriate personal protective equipment (see Section VIII). Do not swallow. Do not get in eyes or on skin or clothing. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container with the

lid securely closed. Wash throughly after handling. Avoid all situations that could lead to harmful exposure.

Store in a cool, dry, well-ventilated area away from incompatible materials. Keep containers tightly closed and protect them from physical damage.

STORAGE Protect from direct light and minimize contact with air. Keep material dry. Keep away from oxidizers, acids and other chemicals. Do not reuse or refill empty containers. Offer to recycling if available or place in trash collection. Do not contaminate food or feed by storage or disposal of this

EPA ID No. NM0890010515

norwec()°

SAFETY DATA SHEET **ENVIRO-C® DECHLORINATION TABLETS** PAGE 2

DATE PREPARED: JANUARY 2018

VIII. EXPOSURE CONTROLS AND PERSONAL PROTECTION

CONSULT LOCAL AUTHORITIES FOR ACCEPTABLE EXPOSURE LIMITS

RECOMMENDED MONITORING PROCEDURES Per OSHA & ACGIH no permissible exposure limits have been established.

ENGINEERING MEASURES Use adequate general or local exhaust ventilation to keep fume and/or dust level as low as possible HYGIENE MEASURES

Wash hands, forearms and face throughly after handling chemical products, before eating, smoking, using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure

that eyewash stations and safety showers are close to the workstation location.

PERSONAL PROTECTION

HANDS Gloves should be worn Natural or synthetic rubber GLOVES

RESPIRATORY Respiratory protection is not required under normal use, however when necessary, use NIOSH/MSHA approved respirator following manufacturer's

recommendations. NIOSH approved dust mask is essential where dusting may occur.

SKIN Boots, aprons or chemical suits as required to prevent skin contact.

ENVIRONMENTAL EXPOSURE CONTROLS

PHYSICAL AND CHEMICAL PROPERTIES

DENSITY (lbs/gal) VAPOR PRESSURE PHYSICAL STATE Solid FLASH POINT Not available Not available DECOMPOSITION TEMPERATURE Not available VAPOR DENSITY Not available MATERIAL SUPPORTS COMBUSTION Not applicable VOLATILITY Not available EVAPORATION RATE COLOR Not available Orange tablet Slight citrus odor ODOR VISCOSITY Not applicable SOLUBILITY 33g/100 mL water @ 25°C 1% Aqueous Solution, 2 to 3

BOILING/CONDENSATION POINT MELTING/FREEZING POINT Not available WATER SOLUBILITY AT ROOM TEMPERATURE Not available PARTITION COEFFICIENT NOCTANOL/WATER Not available Not available SPECIFIC GRAVITY Not available % SOLID (W/W) Not available

STABILITY AND REACTIVITY

STABILITY

CONDITIONS TO AVOID

Exposure to light, air, moisture and high temperatures Incompatible with strong acids, strong bases and strong oxidizers MATERIALS TO AVOID

HAZARDOUS COMBUSTION PRODUCTS Oxides of carbon (CO, CO₂) POSSIBILITY OF HAZARDOUS REACTIONS Not applicable

TOXICOLOGICAL INFORMATION

PERMISSIBLE No permissible exposure limits have been established by OSHA

ACUTE

INHALATION Inhalation may irritate the nose, throat and upper respiratory tract.

Excessive contact may cause skin irritation. Eye contact may cause irritation. Ingestion of small amounts is not likely to produce harmful effects. Chronic ingestion of large quantities may cause gastrointestinal effects including EYE/SKIN INGESTION

nausea, diarrhea, urine acidification, oxalate and uric crystallization in the bladder and kidneys, decreased reaction times, psychomotor coordination. Chronic ingestion of large quantities may cause gastrointestinal effects including nausea, diarrhea, urine acidification, oxalate and uric crystallization CHRONIC

in the bladder and kidneys, decreased reaction times, psychomotor coordination.

ECOLOGICAL INFORMATION

ECOLOGICAL TOXICITY VALUES No information available ENVIRONMENTAL EFFECTS Not applicable BIODEGRADABILITY Not applicable

XIII. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL Dispose in accordance with all local, state and federal regulations.

XIV. TRANSPORTATION INFORMATION

IDENTIFICATION NUMBER Not applicable IM O DESCRIPTION Non-Hazardous U.S. DOT SHIPPING NAME Non-Hazardous Tablets PACKING GROUP Not applicable REPORTABLE QUANTITY HMIS/NFPA RATING Not applicable U.S. DOT HAZARD CLASS Non-Hazardous Not applicable

REGULATORY INFORMATION

UNITED STATES INVENTORY (TSCA) CANADA REGULATIONS (WHÌMIS) Not controlled CERCLA HAZARDOUS SUBSTANCE SARA TITLE III Non-hazardous

XVI. OTHER INFORMATION

OTHER SPECIAL Not applicable DATE OF ISSUE January 21, 2018

THIS SAFETY DATA SHEET IS OFFERED SOLELY FOR YOUR INFORMATION, CONSIDERATION AND INVESTIGATION. THE INFORMATION CONTAINED IN THIS DATA SHEET IS BASED ON PRESENT SCIENTIFIC AND TECHNICAL KNOWLEDGE. THE PURPOSE OF THIS INFORMATION IS TO DRAW ATTENTION TO THE HEALTH AND SAFETY ASPECTS CONCERNING THE PRODUCT AND TO RECOMMEND PRECAUTIONARY MEASURES FOR THE STORAGE AND HANDLING OF THE PRODUCT. NORWALK WASTEWATER EQUIPMENT COMPANY PROVIDES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, AND ASSUMES NO RESPONSIBILTY FOR THE ACCURACY OR COMPLETENESS OF THE DATA CONTAINED HEREIN. NO LIABILITY CAN BE ACCEPTED FOR ANY FAILURE TO OBSERVE THE PRECAUTIONARY MEASURES DESCRIBED IN THIS DATA SHEET OR FOR ANY MISUSE OF THIS PRODUCT.



Bright Dyes FLT Yellow-Green Liquid





Safety Data Sheet

Issue Date: 04-Oct-2013 Revision Date: 06-Feb-2017 Version Number: 1.1

1. Identification

Product Identifiers

Product Name: Bright Dyes® FLT Yellow/Green Liquid

Product Number: 106001

Recommended Use & Restrictions on Use

Water tracing & leak detection dye

Manufacturer/Supplier

Kingscote Chemicals, Inc. 3334 South Tech Blvd. Miamisburg, OH 45342

U.S.A.

Emergency Telephone Number

Company Telephone Number: (937) 886-9100

Emergency Telephone (24 hr): INFOTRAC (800) 535-5053 (North America)

+1-352-323-3500 (International)

2. Hazards Identification

Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least

15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs:

Get medical advice/attention.

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek

medical attention immediately.

Page 1 of 6



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give

anything by mouth to an unconscious person. Get medical attention if large

quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation.

Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the

system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media

Water spray (fog). Carbon dioxide (CO2). Dry chemical. Regular foam.

Unsuitable Extinguishing Media

Not determined

Specific Hazards Arising from the Chemical

Product is not flammable. Burning/combustion may produce oxides of carbon and nitrogen (NOx).

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or

groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area

with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices.

Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing $\,$

should be thoroughly washed before reuse.

Page 2 of 6



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry, and well-

ventilated area. Keep from freezing.

Incompatible Materials Acids.

8. Exposure Controls / Personal Protection

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection Goggles.

Skin & Body Protection Rubber gloves. Suitable protective clothing.

Respiratory Protection No protection is ordinarily required under normal conditions of use.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practices.

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

 Physical State
 Liquid
 Odor
 None apparent

 Appearance
 Yellow/green liquid
 Odor Threshold
 Not determined

 Color
 Yellow/green

PropertyValuespH>8.0Melting/Freezing Point~32° FBoiling Point/Range~212° FFlash PointNot applicable

Evaporation Rate 1.8

Flammability (solid, gas)
Upper Flammability Limits
Lower Flammability Limits
Vapor Pressure
Liquid – not applicable
Not applicable
Not applicable

Vapor Density 0.6

Relative Density
Specific Gravity
Solubility
Partition Coefficient
Auto-ignition Temperature
Viscosity
Not applicable
Not determined

Page 3 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Liquid

10. Stability and Reactivity

Reactivity

Not reactive under normal conditions.

Chemical Stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials

Acids. Strong oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation Avoid breathing vapors or mists.

Ingestion Do not ingest.

Skin Contact May cause an allergic skin reaction.

Eye Contact Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure

May cause an allergic skin reaction.

Numerical Measures of Toxicity

Not determined

Symptoms Associated with Exposure

See Section 4 of this SDS for symptoms.

Carcinogenicity

NTP None

IARC None

OSHA None

Page 4 of 6

Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

12. Ecological Information

Ecotoxicity

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Not available

Persistence/Degradability

Not determined

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. Disposal Considerations

Waste Disposal Methods

Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

Note

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

OMDG Not regulated

15: Regulatory Information

International Inventories

TASCA This product is not subject to TSCA 12(b) reporting requirements.

U.S. Federal Regulations

CERCLA This material, as supplied, does not contain any substances regulated as

hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Page 5 of 6

Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization

Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of

Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants

pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable

state right-to-know regulations.

16: Other Information

HMIS Health Hazards	Flammability O	Instability O	Special Hazards Not determined
<u>NFPA</u> Health Hazards 1	Flammability O	Physical Hazards O	Personal Protection B
Issue Date	04-Oct-2013		
Revision Date	06-Feb-2017		
Revision Note	Content Review		

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Page 6 of 6



Bright Dyes FLT Yellow-Green Tablet





Safety Data Sheet

Issue Date: 09-Nov-2013 Revision Date: 06-Feb-2017 Version Number: 2.1

1. Identification

Product Identifiers

Product Name: Bright Dyes® FLT Yellow/Green Tablet

Product Number: 101101

Recommended Use & Restrictions on Use

Water tracing & leak detection dye

Manufacturer/Supplier

Kingscote Chemicals, Inc. 3334 South Tech Blvd. Miamisburg, OH 45342

U.S.A.

Emergency Telephone Number

Company Telephone Number: (937) 886-9100

Emergency Telephone (24 hr): INFOTRAC (800) 535-5053 (North America)

+1-352-323-3500 (International)

2. Hazards Identification

Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least

15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs:

Get medical advice/attention.

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek

medical attention immediately.

Page 1 of 6



Bright Dyes® FLT Yellow/Green Tablet

Revision Date: 06-Feb-2017

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give

anything by mouth to an unconscious person. Get medical attention if large

quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation.

Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the

system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media

Water spray (fog). Carbon dioxide (CO2). Dry chemical.

Unsuitable Extinguishing Media

Not determined

Specific Hazards Arising from the Chemical

Remote possibility of dust explosion. Burning may produce oxides of carbon and nitrogen (NOx).

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or

groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area

with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices.

Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing

should not be allowed out of the workplace.

Page 2 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Tablet

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry, and well-

ventilated area. Store away from heat, sparks, open flame or any other

ignition source.

Incompatible Materials Bromine trifluoride. Lithium. Strong acids, bases, and oxidizing agents.

8. Exposure Controls / Personal Protection

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection Avoid contact with eyes.

Skin & Body Protection Rubber gloves. Suitable protective clothing.

Respiratory Protection Use NIOSH-approved dust mask if dusty conditions exist.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practices.

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

Physical StateSolidOdorNone apparentAppearanceOrange tabletOdor ThresholdNot determined

Color Orange

Property <u>Values</u> pН Not applicable **Melting/Freezing Point** Not applicable **Boiling Point/Range** Not applicable Flash Point Not applicable **Evaporation Rate** Not applicable Flammability (solid, gas) Not flammable **Upper Flammability Limits** Not applicable **Lower Flammability Limits** Not applicable Vapor Pressure Not applicable **Vapor Density** Not applicable **Relative Density** Not applicable **Specific Gravity** Not applicable

Solubility Highly soluble in water with small amounts of insoluble residue

Partition Coefficient Not determined
Auto-ignition Temperature
Decomposition Temperature
Viscosity Not determined
Not determined
Not determined

Page 3 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Tablet

10. Stability and Reactivity

Reactivity

Not reactive under normal conditions.

Chemical Stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials

Bromine trifluoride. Lithium. Strong acids, bases, and oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation Avoid inhalation of dust.

Ingestion Do not ingest.

Skin Contact May cause an allergic skin reaction.

Eye Contact Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure

May cause an allergic skin reaction.

Numerical Measures of Toxicity

Not determined

Symptoms Associated with Exposure

See Section 4 of this SDS for symptoms.

Carcinogenicity

NTP None

IARC None

OSHA None

Page 4 of 6

Revision Date: 06-Feb-2017

Bright Dyes® FLT Yellow/Green Tablet

12. Ecological Information

Ecotoxicity

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Not available

Persistence/Degradability

This product is biodegradable.

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. Disposal Considerations

Waste Disposal Methods

Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

Note

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

OMDG Not regulated

15: Regulatory Information

International Inventories

Not determined

U.S. Federal Regulations

CERCLA This material, as supplied, does not contain any substances regulated as

hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Page 5 of 6

Bright Dyes® FLT Yellow/Green Tablet

Revision Date: 06-Feb-2017

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization

Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of

Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants

pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable

state right-to-know regulations.

16: Other Information

<u>HMIS</u> Health Hazards	Flammability	Instability	Special Hazards
nealth nazarus	riammability	instability	Special nazarus
1	0	0	Not determined

<u>NFPA</u>

Health HazardsFlammabilityPhysical HazardsPersonal Protection100B

Issue Date 09-Nov-2013

Revision Date 06-Feb-2017

Revision Note Content Review

Disclaimer

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End of Safety Data Sheet

Page 6 of 6



Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application Outfall 03A199 Fact Sheet

Utilities and Infrastructure (U&I)
Laboratory Data Communications Center (LDCC) Cooling Towers





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Table of Contents

1.0	OUTFALL LOCATION [Section I]	5
2.0	FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]	5
2.1	Process Schematic and Water Balance [II.A]	5
2.2	Water Treatment Processes [II.B]	5
2.3	Discharge Rate and Frequency [II.C]	6
3.0	PRODUCTION [Section III]	6
4.0	IMPROVEMENTS [Section IV]	7
5.0	INTAKE AND EFFLUENT CHARACTERISTICS [Section V]	7
5.1	Analytical Data [V.A, B, and C]	7
5.2	Potential Pollutants [V.D]	7
6.0	POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]	7
7.0	BIOLOGICAL TOXICITY TESTING DATA [Section VII]	7
8.0	CONTRACT ANALYSIS INFORMATION [Section VIII]	7
ATTAC	CHMENT A: Location Map for Outfall 03A199	A-1
ATTAC	CHMENT B: Process Schematics and Water Balances	B-1
ATTAC	CHMENT C: Photographs	C-1
ATTAC	CHMENT D: Summary Discharge Monitoring Report September 2014 – September 2018	D-1
ATTAC	CHMENT E: Safety Data Sheets	E-1

List of Tables

- 1 Sources for Discharges to Outfall 03A199
- Wastewater Treatment Codes Assigned to Outfall 03A199
- 3 List of Treatment Chemicals used in the Operations that Contribute to Outfall 03A199
- 4 Flow Rates and Frequencies for Discharges to Outfall 03A199
- 5 Potential Pollutants by Source for Outfall 03A199
- 6 List of Independent Laboratories Used for NPDES Water Analysis



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2019 NPDES PERMIT RE-APPLICATION OUTFALL 03A199 Fact Sheet

1.0 OUTFALL LOCATION [Section I]

Outfall ID No.:	03A199	Outfall Location:	Technical Area 3
Category:	03A, Treated Cooling Water	Originating Structure for the	TA-3-1837, Laboratory Data
	Discharges	Discharge:	Communications Center (LDCC)
Flow Type:	Intermittent	Receiving Stream:	Ephemeral Tributary to Sandia
			Canyon in Water Quality Segment
			20.6.4.126 NMAC
Longitude:	106° 18' 46" W	Latitude:	35° 52' 20" N

2.0 FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]

Outfall 03A199 is located at TA-3 and discharges to a ephemeral tributary to Sandia Canyon in Water Quality Segment 20.6.4.126 NMAC. The outfall discharges treated cooling tower blowdown that originates from the Laboratory Data Communications Center (LDCC) at TA-3-1837. Attachment A provides a location map. The cooling tower blow-down is comprised of potable water that is treated by a cooling tower water treatment system. Table 1 identifies the discharge source, the source location, and source composition.

	Table 1 Sources for Discharges to Outfall 03A199												
TA													
3	1837	Cooling	Piping	Laboratory Data Communications Center (LDCC) Cooling Towers	Treated Cooling Tower Blowdown Potable Water Used as Makeup Water								

2.1 Process Schematic and Water Balance [II.A]

A process schematic line drawing that shows the outfall source and route taken by water is provided in Attachment B. This drawing includes all operations that contribute treated cooling water to the discharge at Outfall 03A199. A water balance is also provided on the process schematic with average flows. The water balance is based upon actual data collected from cooling towers operations personnel and the flow meter/totalizer associated with the outfall.

2.2 Water Treatment Processes [II.B]

The LDCC currently has three cooling towers that provide cooling water to the chillers to support cooling of computers and building systems. Makeup water is fed to the cooling tower basins, circulated through the facility chillers, and routed back to the cooling towers approximately 2-3 times before it is blown down and recharged with fresh makeup water. The cooling tower is maintained by a water treatment system that draws a small amount of water from the basin discharge line into a process logic controller and monitoring system to determine conductivity and chlorine content. This system determines the amount and adds water treatment chemicals to the basin. The LDCC Cooling Towers are treated with corrosion inhibitor, biocide, a pH adjustment chemical, and small amounts of tracing/monitoring chemicals. The PLC/monitoring system also determines the blowdown rate. Blowdown is discharged to Outfall 03A199 or may be discharged to the SWWS. The dechlorination chemical is added to the blowdown as it is discharged to Outfall 03A199. Table 2 identifies the waste water treatment codes associated with the water treatment system. Attachment C provides photographs of the outfall, cooling towers, and the wastewater treatment equipment.

Table 2 Wastewater Treatment Codes Assigned to Outfall 03A199													
Source	Source Treatment Description Justification Code												
Laboratory Data	2-E	De-Chlorination	Chlorine Scavenger Chemicals are Added										
Communications Center	2-H	Disinfection (other)	Chemicals are added to Control Microorganisms										
(LDCC) Cooling Towers	2-L	Reduction	Chemicals that are Antiscalant and Corrosion Inhibitors are Added										



The water treatment processes identified in Table 2 utilize chemicals to monitor the water quality in the cooling tower, control corrosion, limit biological growth, and de-chlorinate blowdown prior to discharge. Table 3 provides a list of the chemicals used to treat the water in the cooling towers.

Li	st of Treatment Chemicals u	Table 3 used in the Operations that Contri	bute to Outfall 03A199		
Source	Chemical Name	Reason for Use	Toxic Pollutant and/or Haz Substances Table 2C-3 or		
LDCC Cooling Towers	Bromicide Tablets	Biocide	Bromo-chloro-5,5-dimethyl hydantoin (chlorine source)	2C-4	
	HACH 203832	Sulfuric Acid Solution 19.2N	Sulfuric Acid	2C-4	
	HACH 1407028	Free Chorine Reagent	Sodium Phosphate Dibasic EDTA	2C-4 2C-4	
	HACH 2076053	HACH 2076053 Molybdovanadate Reagent		2C-4	
	HACH 2105669	Total Chlorine Reagent	Sodium Phosphate Dibasic	2C-4	
	HACH 2263411	Total Chlorine Indicator	Sulfuric Acid	2C-4	
	HACH 2263511	Total Chlorine Buffer Solution	Sodium Hydroxide	2C-4	
			EDTA	2C-4	
	HACH 2297255	Compound for Free and Total Chlorine Analyzers	NA	NA	
	HACH 2314011	Free Chlorine Indicator Solution for CL-17 Analyzer	Toluene	2C-4	
	HACH 2314111	Free Chlorine Buffer for CL- 117 Analyzer	NA	NA	
	HACH 2756549	pH Storage Solution	Sodium Phosphate Dibasic	2C-4	
	WEST C-358P	Corrosion Inhibitor & Antiscalant	Potassium Hydroxide	2C-4	
	WEST C-825	pH control (neutralization)	Sodium Bisulfite	2C-4	
	WEST R-630	Dechlorination	Sodium Bisulfite	2C-4	
	Bright Dyes FLT Yellow/Green Liquid	Water Line & Drain Tracing Dye	NA	NA	
	Bright Dyes FLT Yellow/Green Tablet	Water Line & Drain Tracing Dye	NA	NA	

EDTA = Ethylene Diamine Tetraacetic Acid; NA = not applicable; LDCC = Laboratory Data Communications Center

2.3 Discharge Rate and Frequency [II.C]

The discharge rates and frequencies for Outfall 03A199 are provided in Table 4.

Table 4												
Flow Rates and Frequencies for Discharges to Outfall 03A199												
	Freque	ncy		F	Flow Rates and Volumes							
Source ^a	Days/Week	Months	Average (MGD)	Maximum (MGD)	Average Volume (GPD)	Maximum Volume (GPD)	Duration (days)					
LDCC Cooling Towers	7	12	0.036	0.074	36,024	74,000	365					

a. Calculated between October 2017 and September 2018.

GPD = gallons per day; MGD = million gallons per day; LDCC = Laboratory Data Communications Center

3.0 PRODUCTION [Section III]

Section III is not applicable to Outfall 03A199.



4.0 IMPROVEMENTS [Section IV]

Section IV is not applicable to Outfall 03A199.

5.0 INTAKE AND EFFLUENT CHARACTERISTICS [Section V]

5.1 Analytical Data [V.A, B, and C]

The analytical results provided for the Outfall 03A199 Permit Reapplication on the Form 2C were provided from the following sources:

- Samples collected on August 15, 2018 and shipped to an independent laboratory for analysis.
- Field samples collected and analyzed on August 15, 2018 for temperature, residual chlorine, and pH.
- Field samples collected and analyzed on January 16, 2019 for sulfite.
- Discharge monitoring report summary for Outfall 03A199 from October 2014 to September 2018 (Attachment D).
- Hardness = 79.1 mg/L (CaCO₃)

5.2 Potential Pollutants [V.D]

The treatment chemicals associated with the LDCC Cooling Tower water treatment system, the use of potable water that has been conditioned in the water treatment system constitutes the pollutant load of the discharge to Outfall 03A199. Table 5 identifies the Table 2C-3 and 2C-4 pollutants by discharge source. It also identifies those pollutants (if any) that were detected in the analytical results from the samples collected for the 2019 Permit Renewal Application.

Table 5 Potential Pollutants by Source for Outfall 03A199											
Source Pollutant Analytical Data Results Outfall 03A199 a											
LDCC Cooling Towers	EDTA	2C-4	pH = 7.3 – 8.6 S.U.								
_	potassium hydroxide	2C-4	pH = 7.3 – 8.6 S.U.								
	sodium bisulfite	2C-4	Sulfite = 9.1 mg/L								
	sodium hydroxide	2C-4	pH = 7.3 – 8.6 S.U.								
	sodium phosphate dibasic	2C-4	Total phosphorus = 1.58								
	sulfuric acid	2C-4	pH = 7.3 – 8.6 S.U.								
	toluene	2C-4	Not Detected (VOC)								
	chlorine	2C-4	Residual chlorine = 0								
Potable Makeup Water	chlorine	2C-4	Total residual chlorine = 0								

a. Results are from the representative sample collected at Outfall 03A199 on August 15, 2018.

EDTA = Ethylene Diamine Tetraacetic Acid; LDCC = Laboratory Data Communications Center; S.U. = standard units; VOC = volatile organic compound

The safety data sheets associated with the chemicals used to treat water at the LDCC are provided in Attachment E.

6.0 POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]

Section VI is not applicable to Outfall 03A199.

7.0 BIOLOGICAL TOXICITY TESTING DATA [Section VII]

Section VII is not applicable to Outfall 03A199.

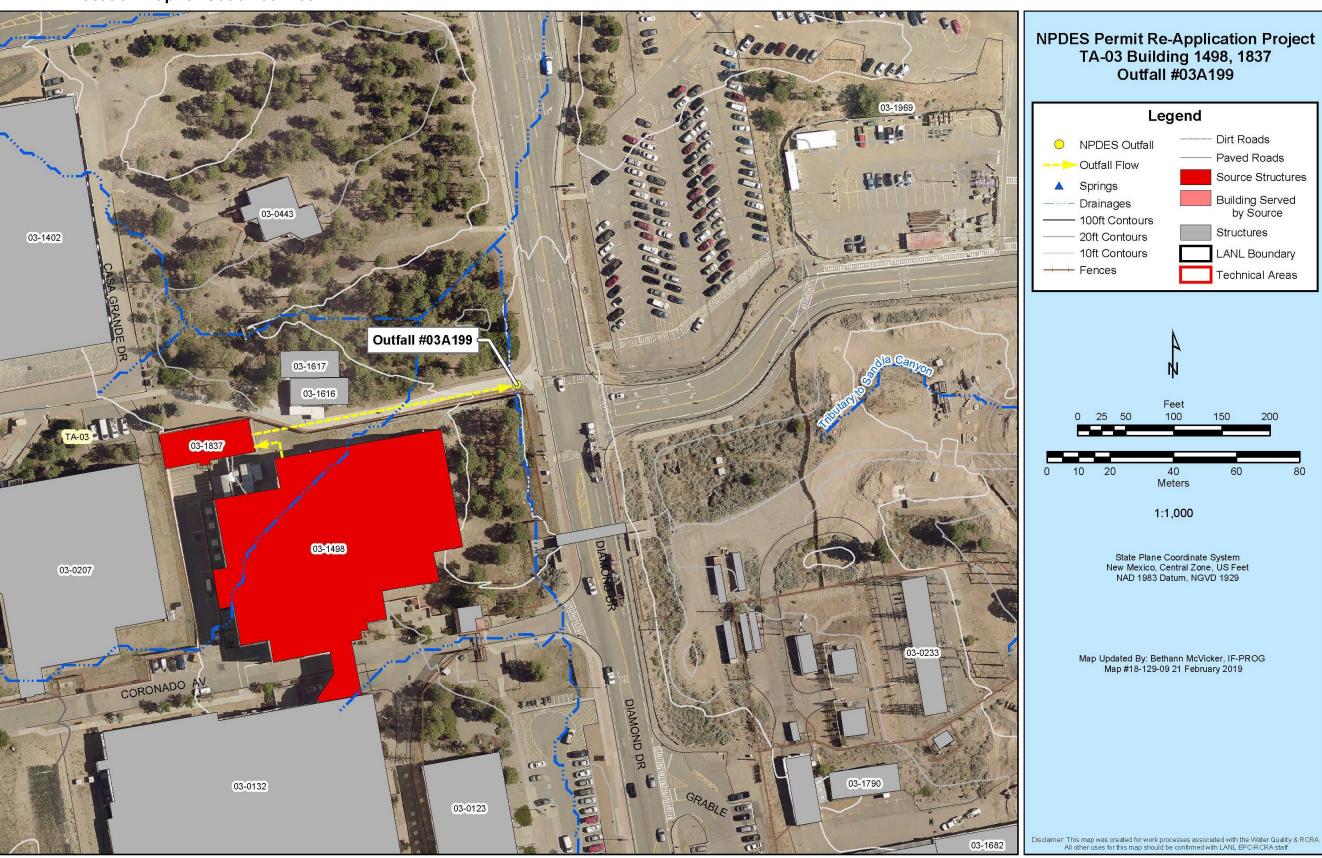
8.0 CONTRACT ANALYSIS INFORMATION [Section VIII]

Samples from the LDCC blowdown were collected on August 15, 2018 for the Form 2C constituents required by the permit application forms. These samples were submitted to independent laboratories as summarized in Table 6.



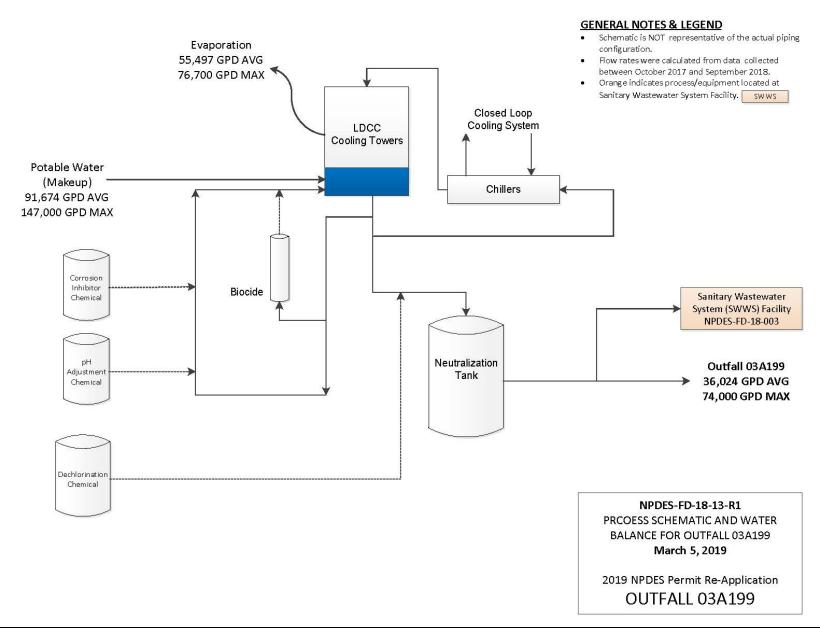
List o	Table 6 List of Independent Laboratories Used for NPDES Water Analysis											
Laboratory Name	Address and Contact Info	Analytical Parameters										
GEL Laboratories LLC	2040 Savage Road	Biological Oxygen Demand, General Chemistry,										
	Charleston SC 29407	Pesticides, Polychlorinated Biphenyls, Radiochemistry,										
	(843) 556-8171	Semi-volatile Organic Compounds, Total Metals, Total										
		Suspended Solids, Volatile Organic Compounds										
New Mexico Water	401 North Coronado Ave	E.coli										
Testing Laboratory, Inc.	Espanola, NM 87532											
	(505) 929-4545											
Cape Fear Analytical LLC	3306 Kitty Hawk Road Suite 120	TCDD (Dioxin)										
	Wilmington, NC 28405											
	(910) 795-0421											

ATTACHMENT A: Location Map for Outfall 03A199





ATTACHMENT B: Process Schematics and Water Balances





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ATTACHMENT C: Photographs

Photograph ID No.	Photograph Title
NPDES-03A199-18-002	Outfall 03A199 Condition at Discharge Location
NPDES-03A199-18-003	Outfall 03A199 Receiving Stream Ephemeral Tributary to Sandia Canyon, Water Quality Segment Number 20.6.4.126 NMAC
NPDES-03A199-18-004	LDCC Cooling Towers
NPDES-03A199-18-005	LDCC Corrosion Inhibior Chemical Feed Tanks
NPDES-03A199-18-006	Neutralization Tank
NPDES-03A199-18-007	Brominator
NPDES-03A199-18-008	LDCC Dechlorination Chemical Feed Tank



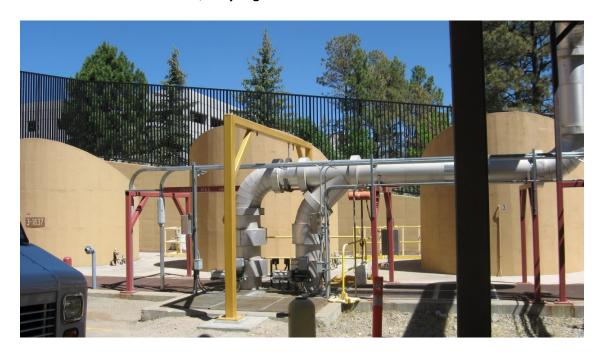
Photograph - NPDES-03A199-18-002 **Outfall 03A199 Condition at Discharge Location**

LA-UR-19-22215 Attachment C C-1 of 4





Photograph - NPDES-03A199-18-003
Outfall 03A199 Receiving Stream Ephemeral Tributary to Sandia Canyon,
Water Quality Segment Number 20.6.4.126 NMAC



Photograph - NPDES-03A199-18-004 LDCC Cooling Towers





Photograph - NPDES-03A199-18-005 LDCC Corrosion Inhibitor and pH Adjustment Chemical Feed Tanks



Photograph - NPDES-03A199-18-006 **LDCC Neutralization Tank**

LA-UR-19-22215 Attachment C C-3 of 4



Photograph - NPDES-03A199-18-007 LDCC Brominator



Photograph - NPDES-03A199-18-008 LDCC Dechlorination Chemical Feed Tank



ATTACHMENT D: Summary Discharge Monitoring Report October 2014 – September 2018

					Quantity o	r Loading		Quality or C	oncentration							
OUTFALL			Monitoring											Number of		
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency	Notes
03A199	TA3-1837	2014	Oct	Flow (Totalized Est.)	0.025471	0.028200	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2014	Nov	Flow (Totalized Est.)	0.020687	0.024400	MGD							30	Daily	Required by Permit
03A199	TA3-1837	2014	Dec	Flow (Totalized Est.)	0.020281	0.022200	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2015	Jan	Flow (Totalized Est.)	0.020219	0.023000	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2015	Feb	Flow (Totalized Est.)	0.021961	0.025300	MGD							28	Daily	Required by Permit
03A199	TA3-1837	2015	Mar	Flow (Totalized Est.)	0.021926	0.026300	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2015	Apr	Flow (Totalized Est.)	0.022027	0.268000	MGD							30	Daily	Required by Permit
03A199	TA3-1837	2015	May	Flow (Totalized Est.)	0.021871	0.027600	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2015	Jun	Flow (Totalized Est.)	0.028983	0.036600	MGD							30	Daily	Required by Permit
03A199	TA3-1837	2015	Jul	Flow (Totalized Est.)	0.027193	0.032700	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2015	Aug	Flow (Totalized Est.)	0.028116	0.033400	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2015	Sept	Flow (Totalized Est.)	0.027750	0.031700	MGD							30	Daily	Required by Permit
03A199	TA3-1837	2015	Oct	Flow (Totalized Est.)	0.021813	0.027700	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2015	Nov	Flow (Totalized Est.)	0.018923	0.022700	MGD							30	Daily	Required by Permit
03A199	TA3-1837	2015	Dec	Flow (Totalized Est.)	0.017784	0.021220	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2016	Jan	Flow (Totalized Est.)	0.015897	0.018100	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2016	Feb	Flow (Totalized Est.)	0.017348	0.022700	MGD							29	Daily	Required by Permit
03A199	TA3-1837	2016	Mar	Flow (Totalized Est.)	0.018784	0.022500	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2016	Apr	Flow (Totalized Est.)	0.020503	0.023800	MGD							30	Daily	Required by Permit
03A199	TA3-1837	2016	May	Flow (Totalized Est.)	0.024119	0.028700	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2016	Jun	Flow (Totalized Est.)	0.029933	0.033600	MGD							30	Daily	Required by Permit
03A199	TA3-1837	2016	Jul	Flow (Totalized Est.)	0.321520	0.034300	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2016	Aug	Flow (Totalized Est.)	0.030419	0.033800	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2016	Sept	Flow (Totalized Est.)	0.029093	0.031900	MGD							30	Daily	Required by Permit
03A199	TA3-1837	2016	Oct	Flow (Totalized Est.)	0.028271	0.030600	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2016	Nov	Flow (Totalized Est.)	0.026162	0.028600	MGD							30	Daily	Required by Permit
03A199	TA3-1837	2016	Dec	Flow (Totalized Est.)	0.020310	0.029400	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2017	Jan	Flow (Totalized Est.)	0.026794	0.033800	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2017	Feb	Flow (Totalized Est.)	0.031882	0.035600	MGD							28	Daily	Required by Permit
03A199	TA3-1837	2017	Mar	Flow (Totalized Est.)	0.033390	0.036100	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2017	Apr	Flow (Totalized Est.)	0.032317	0.036000	MGD							30	Daily	Required by Permit
03A199	TA3-1837	2017	May	Flow (Totalized Est.)	0.032781	0.035300	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2017	Jun	Flow (Totalized Est.)	0.028130	0.030900	MGD							30	Daily	Required by Permit
03A199	TA3-1837	2017	Jul	Flow (Totalized Est.)	0.026829	0.031000	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2017	Aug	Flow (Totalized Est.)	0.030726	0.033900	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2017		Flow (Totalized Est.)	0.032880	0.035600	MGD							30	Daily	Required by Permit
03A199	TA3-1837	2017		Flow (Totalized Est.)	0.031094	0.033000	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2017	Nov	Flow (Totalized Est.)	0.031473	0.033500	MGD							30	Daily	Required by Permit
03A199	TA3-1837	2017	Dec	Flow (Totalized Est.)	0.030574	0.031600	MGD							31	Daily	Required by Permit



					Quantity o	r Loading		Quality or 0	Concentration	n						
OUTFALL			Monitoring		•			,						Number of		
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency	Notes
03A199	TA3-1837	2018	Jan	Flow (Totalized Est.)	0.032958	0.035600	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2018	Feb	Flow (Totalized Est.)	0.031386	0.034300	MGD							28	Daily	Required by Permit
03A199	TA3-1837	2018	Mar	Flow (Totalized Est.)	0.029981	0.323000	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2018	Apr	Flow (Totalized Est.)	0.032457	0.036700	MGD							30	Daily	Required by Permit
03A199	TA3-1837	2018	May	Flow (Totalized Est.)	0.036645	0.044100	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2018	Jun	Flow (Totalized Est.)	0.045666	0.049400	MGD							30	Daily	Required by Permit
03A199	TA3-1837	2018	Jul	Flow (Totalized Est.)	0.044987	0.049100	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2018	Aug	Flow (Totalized Est.)	0.045219	0.048700	MGD							31	Daily	Required by Permit
03A199	TA3-1837	2018	Sept	Flow (Totalized Est.)	0.039890	0.074000	MGD							30	Daily	Required by Permit
				Flow (Totalized Est.)	Max	imum 30 Day	Average		0.3215		mg/L			1461		
				Flow (Totalized Est.)		N	laximum			0.3230	mg/L			1461		
03A199	TA3-1837	2014	Oct	рН				8.3	***	8.4	S.U.	6.6 - 8.8	S.U.	5.0	Weekly	Required by Permit
03A199	TA3-1837	2014	Nov	рН				8.1	****	8.5	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2014	Dec	рН				8.3	***	8.4	S.U.	6.6 - 8.8	S.U.	5.0	Weekly	Required by Permit
03A199	TA3-1837	2015	Jan	рН				8.3	***	8.3	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2015	Feb	рН				8.2	***	8.3	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2015	Mar	рН				8.1	***	8.3	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2015	Apr	рН				8.2	****	8.5	S.U.	6.6 - 8.8	S.U.	5.0	Weekly	Required by Permit
03A199	TA3-1837	2015	May	рН				8.3	***	8.5	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2015	Jun	рН				8.1	***	8.3	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2015	Jul	рН				8.0	***	8.4	S.U.	6.6 - 8.8	S.U.	5.0	Weekly	Required by Permit
03A199	TA3-1837	2015	Aug	рН				8.1	****	8.2	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2015	Sept	рН				8.1	***	8.3	S.U.	6.6 - 8.8	S.U.	5.0	Weekly	Required by Permit
03A199	TA3-1837	2015	Oct	рН				8.1	***	8.3	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2015	Nov	рН				8.0	***	8.3	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2015	Dec	рН				8.1	***	8.4	S.U.	6.6 - 8.8	S.U.	5.0	Weekly	Required by Permit
03A199	TA3-1837	2016	Jan	рН				8.3	****	8.5	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2016	Feb	рН				8.4	****	8.6	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2016	Mar	рН				8.3	****	8.6	S.U.	6.6 - 8.8	S.U.	5.0	Weekly	Required by Permit
03A199	TA3-1837	2016	Apr	рН				8.1	****	8.2	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2016	May	рН				8.1	****	8.1	S.U.	6.6 - 8.8	S.U.	5.0	Weekly	Required by Permit
03A199	TA3-1837	2016	Jun	рН				8.1	****	8.1	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2016	Jul	рН				7.9	****	8.2	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2016	Aug	рН				7.7	****	8.0	S.U.	6.6 - 8.8	S.U.	5.0	Weekly	Required by Permit
03A199	TA3-1837	2016	Sept	рН				7.8	****	8.1	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2016	Oct	рН				8.0	****	8.2	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2016	Nov	рН				7.9	****	8.2	S.U.	6.6 - 8.8	S.U.	5.0	Weekly	Required by Permit
03A199	TA3-1837	2016	Dec	рН				7.5	****	8.1	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2017	Jan	рН				7.4	****	7.7	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2017	Feb	рН				7.7	****	7.9	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2017	Mar	рН				7.7	***	7.9	S.U.	6.6 - 8.8	S.U.	5.0	Weekly	Required by Permit



					Quantity o	r Loading		Quality or 0	Concentration							
OUTFALL			Monitoring											Number of		
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency	Notes
03A199	TA3-1837	2017	Apr	рН				7.7	****	7.8	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2017	May	рН				7.7	****	7.9	S.U.	6.6 - 8.8	S.U.	5.0	Weekly	Required by Permit
03A199	TA3-1837	2017	Jun	рН				7.8	****	7.8	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2017	Jul	рН				7.7	****	7.9	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2017	Aug	рН				7.9	****	8.0	S.U.	6.6 - 8.8	S.U.	5.0	Weekly	Required by Permit
03A199	TA3-1837	2017	Sept	рН				7.9	****	8.0	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2017	Oct	рН				7.7	***	8.4	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2017	Nov	рН				7.3	***	7.9	S.U.	6.6 - 8.8	S.U.	5.0	Weekly	Required by Permit
03A199	TA3-1837	2017	Dec	рН				7.5	****	7.8	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2018	Jan	рН				7.6	****	7.9	S.U.	6.6 - 8.8	S.U.	5.0	Weekly	Required by Permit
03A199	TA3-1837	2018	Feb	pH				7.7	****	7.8	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2018		pH				7.6	****	7.9	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2018	Apr	pH				7.5	****	8.3	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2018	•	pH				7.3	****	7.7	S.U.	6.6 - 8.8	S.U.	5.0	Weekly	Required by Permit
03A199	TA3-1837	2018		pH				7.3	****	7.7	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2018		pH				7.7	****	7.9	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
03A199	TA3-1837	2018	Aug	pH				7.9	****	8.1	S.U.	6.6 - 8.8	S.U.	5.0	Weekly	Required by Permit
03A199	TA3-1837	2018	Sept	pH				7.7	****	8.1	S.U.	6.6 - 8.8	S.U.	4.0	Weekly	Required by Permit
							Minimum	7.3			S.U.			209		
					Max	imum 30 Day	y Average		8.45		S.U.			209		
		T		1		ľ	Maximum			8.6	S.U.			209		
03A199	TA3-1837	2014		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
03A199	TA3-1837	2014		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2014		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
03A199	TA3-1837	2015		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2015		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2015		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2015	•	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
03A199	TA3-1837	2015		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2015		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2015		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
03A199	TA3-1837	2015	Aug	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2015	Sept	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
03A199	TA3-1837	2015	Oct	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2015	Nov	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2015	Dec	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
03A199	TA3-1837	2016	Jan	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2016	Feb	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2016	Mar	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
03A199	TA3-1837	2016	Apr	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2016	May	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit



					Quantity o	r Loading		Quality or C	Concentration							
OUTFALL		ı	Monitoring											Number of		
No.	TA - Bldg.	Year I	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency	Notes
03A199	TA3-1837		Jun	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2016	Jul	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2016	Aug	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
03A199	TA3-1837	2016	Sept	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2016	Oct	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2016 I	Nov	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
03A199	TA3-1837	2016 I	Dec	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2017 J	Jan	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2017 I	Feb	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2017 I	Mar	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
03A199	TA3-1837	2017	Apr	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2017 I	May	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
03A199	TA3-1837	2017	Jun	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2017	Jul	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2017	Aug	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
03A199	TA3-1837	2017	Sept	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2017	Oct	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2017 I	Nov	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
03A199	TA3-1837	2017 I	Dec	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2018	Jan	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
03A199	TA3-1837	2018 I	+	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2018 I	Mar	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2018		Total Residual Chlorine				***	****	0.98	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2018 I		Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
03A199	TA3-1837	2018		Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
03A199	TA3-1837	2018	+	Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
+	TA3-1837	2018		Total Residual Chlorine				***	****	0	mg/L	0.011	mg/L	5.0	Weekly	Required by Permit
03A199	TA3-1837	2018		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4.0	Weekly	Required by Permit
		l l	<u>'</u>			Daily	/ Average		0.02		mg/L		<u> </u>	209	,	, ,
					Max	imum 30 Day			0.98		mg/L			209		
						Daily N	/laximum			0.98	mg/L			209		
03A199	TA3-1837	2014 I	Dec	Total Suspended Solids				****	1	1	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit
03A199	TA3-1837	2015 I	Mar	Total Suspended Solids				****	1	1	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit
03A199	TA3-1837	2015		Total Suspended Solids				****	1	1	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit
03A199	TA3-1837	2015		Total Suspended Solids				****	3.1	3.1	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit
03A199	TA3-1837	2015 I		Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit
03A199	TA3-1837	2016 I		Total Suspended Solids				****	1.17	1.17	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit
03A199	TA3-1837	2016	*	Total Suspended Solids				****	1.1	1.1	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit
03A199	TA3-1837	2016	*	Total Suspended Solids				****	<5.7	<5.7	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit
03A199	TA3-1837	2016 I	•	Total Suspended Solids				****	1.22	1.22	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit
03A199	TA3-1837	2017		Total Suspended Solids				****	4.7	4.7	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit



					Quantity o	r Loading		Quality or C	Concentration	centration							
OUTFALL			Monitoring		•									Number of			
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency	Notes	
03A199	TA3-1837	2017	Jun	Total Suspended Solids				****	0.7	0.7	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit	
03A199	TA3-1837	2017	Sept	Total Suspended Solids				****	1.5	1.5	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit	
03A199	TA3-1837	2017	Dec	Total Suspended Solids				****	0.957	0.957	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit	
03A199	TA3-1837	2018	Mar	Total Suspended Solids				****	1	1	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit	
03A199	TA3-1837	2018	Jun	Total Suspended Solids				****	1	1	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit	
03A199	TA3-1837	2018	Sept	Total Suspended Solids				****	1.74	1.8	mg/L	30 - 100	mg/L	2	Quarterly	Required by Permit	
				Total Suspended Solids		Daily	y Average		1.5		mg/L			17			
				Total Suspended Solids	Max	imum 30 Day	y Average		4.7		mg/L			17			
				Total Suspended Solids		N	Maximum			4.7	mg/L			17			
03A199	TA3-1837	2014	Dec	Phosphorus, Total				***	1.39	1.39	mg/L	20 - 40	mg/L	1	Quarterly	Required by Permit	
03A199	TA3-1837	2015	Mar	Phosphorus, Total				***	1.58	1.58	mg/L	20 - 40	mg/L	1	Quarterly	Required by Permit	
03A199	TA3-1837	2015	Jun	Phosphorus, Total				***	1.46	1.46	mg/L	20 - 40	mg/L	1	Quarterly	Required by Permit	
03A199	TA3-1837	2015	Sept	Phosphorus, Total				***	1.29	1.29	mg/L	20 - 40	mg/L	1	Quarterly	Required by Permit	
03A199	TA3-1837	2015	Dec	Phosphorus, Total				***	1.41	1.41	mg/L	20 - 40	mg/L	1	Quarterly	Required by Permit	
03A199	TA3-1837	2016	Mar	Phosphorus, Total				***	0.428	0.428	mg/L	20 - 40	mg/L	1	Quarterly	Required by Permit	
03A199	TA3-1837	2016	Jun	Phosphorus, Total				***	0.256	0.256	mg/L	20 - 40	mg/L	1	Quarterly	Required by Permit	
03A199	TA3-1837	2016	Sept	Phosphorus, Total				***	0.455	0.455	mg/L	20 - 40	mg/L	1	Quarterly	Required by Permit	
03A199	TA3-1837	2016	Dec	Phosphorus, Total				****	0.583	0.583	mg/L	20 - 40	mg/L	1	Quarterly	Required by Permit	
03A199	TA3-1837	2017	Mar	Phosphorus, Total				***	0.634	0.634	mg/L	20 - 40	mg/L	1	Quarterly	Required by Permit	
03A199	TA3-1837	2017	Jun	Phosphorus, Total				***	0.348	0.348	mg/L	20 - 40	mg/L	1	Quarterly	Required by Permit	
03A199	TA3-1837	2017	Sept	Phosphorus, Total				***	0.409	0.0409	mg/L	20 - 40	mg/L	1	Quarterly	Required by Permit	
03A199	TA3-1837	2017	Dec	Phosphorus, Total				***	0.339	0.339	mg/L	20 - 40	mg/L	1	Quarterly	Required by Permit	
03A199	TA3-1837	2018	Mar	Phosphorus, Total				***	0.338	0.338	mg/L	20 - 40	mg/L	1	Quarterly	Required by Permit	
03A199	TA3-1837	2018	Jun	Phosphorus, Total				***	0.369	0.369	mg/L	20 - 40	mg/L	1	Quarterly	Required by Permit	
03A199	TA3-1837	2018	Sept	Phosphorus, Total				****	0.293	0.319	mg/L	20 - 40	mg/L	2	Quarterly	Required by Permit	
				Phosphorus, Total		Daily	y Average		0.7		mg/L			17			
				Phosphorus, Total	Max	imum 30 Day	y Average		1.58		mg/L			17			
	1	_		Phosphorus, Total		<u> </u>	Maximum			1.58	mg/L			17			
03A199	TA3-1837		Sept	Aluminum, Total				****	****	<0.015	mg/L	0.9889	mg/L	1	Yearly	Required by Permit	
03A199	TA3-1837		Sept	Aluminum, Total				****	****	<0.015	mg/L	0.9889	mg/L	1	Yearly	Required by Permit	
03A199	TA3-1837	2017	· ·	Aluminum, Total				****	****	<0.0193	mg/L	0.9889	mg/L	1	Yearly	Required by Permit	
03A199	TA3-1837	2018	Sept	Aluminum, Total				****	****	<0.0193	mg/L	0.9889	mg/L	1	Yearly	Required by Permit	
				Aluminum			y Average	1			mg/L			4			
Aluminum						imum 30 Day	y Average				mg/L			4			
Aluminum						<u> </u>	Maximum			0.00000	mg/L			4			
03A199	TA3-1837		Sept	Copper, Dissolved				****	****	0.00219	mg/L	0.0073	mg/L	1	Yearly	Required by Permit	
03A199	TA3-1837		Sept	Copper, Dissolved				****	****	0.00273	mg/L	0.0073	mg/L	1	Yearly	Required by Permit	
03A199	TA3-1837	2017	•	Copper, Dissolved				****	****	0.00303	mg/L	0.0073	mg/L	1	Yearly	Required by Permit	
03A199	TA3-1837	2018	Sept	Copper, Dissolved				****	****	0.00064	mg/L	0.0073	mg/L	1	Yearly	Required by Permit	
				Copper			y Average				mg/L			4			
			Copper	Max	timum 30 Day	y Average				mg/L			4				



					0			Quality or Concentration										
							Quantity or Loading			T T		T	T		I			
OUTFALL			Monitoring											Number of				
No.	TA - Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency	Notes		
				Copper	Maximum					0.00303	mg/L			4				
03A199	TA3-1837	2015	Sept	Mercury, Dissolved				****	****	<0.067	ug/L	0.77	ug/L	1	Yearly	Required by Permit		
03A199	TA3-1837	2016	Sept	Mercury, Dissolved				****	****	<0.067	ug/L	0.77	ug/L	1	Yearly	Required by Permit		
03A199	TA3-1837	2017	Sept	Mercury, Dissolved				****	****	<0.067	ug/L	0.77	ug/L	1	Yearly	Required by Permit		
03A199	TA3-1837	2018	Sept	Mercury, Dissolved				****	****	<0.067	ug/L	0.77	ug/L	1	Yearly	Required by Permit		
	•			Mercury, Dissolved		Daily	y Average				ug/L			4				
				Mercury, Dissolved	Max	imum 30 Day	y Average				ug/L			4				
Mercury, Dissolved						ſ	Maximum			0	ug/L			4				
03A199	TA3-1837	2015	Sept	Mercury, Total				****	***	<0.067	ug/L	0.77	ug/L	1	Yearly	Required by Permit		
03A199	TA3-1837	2016	Sept	Mercury, Total				****	***	<0.067	ug/L	0.77	ug/L	1	Yearly	Required by Permit		
03A199	TA3-1837	2017	Sept	Mercury, Total				****	***	<0.067	ug/L	0.77	ug/L	1	Yearly	Required by Permit		
03A199	TA3-1837	2018	Sept	Mercury, Total				****	***	<0.067	ug/L	0.77	ug/L	1	Yearly	Required by Permit		
				Mercury, Total		Daily	y Average				ug/L			4				
				Mercury, Total	Max	imum 30 Day	y Average				ug/L			4				
			Mercury, Total		ſ	Maximum			0	ug/L			4					
												Required						
03A199	TA3-1837	2015	Sept	Gross Alpha				****	0	0	pCi/L	Monitoring	pCi/L	1	Term	Required by Permit		
Gross Alpha Daily Av						y Average				pCi/L			1					
				Gross Alpha	Max	imum 30 Day	y Average				pCi/L			1				
				Gross Alpha		١	Maximum			0	pCi/L			1				



ATTACHMENT E: Safety Data Sheets

IST OF SATEY DATA SHEETS
romocide
ACH 1407028
ACH 203832
ACH 2076053
ACH 2105669
ACH 2263411
ACH 2263511
ACH 2297255
ACH 2314011
ACH 2314111
ACH 2756549
VEST C-358P Inhibitor
VEST C-825
VEST R-630
right Dyes FLT Yellow/Green Liquid
right Dyes FLT Yellow/Green Tablet



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BROMOCIDE

Revision date: 3/28/2016

Revision: 9



SAFETY DATA SHEET BROMICIDE TABLETS

1. Identification

Product identifier

Product name BROMICIDE TABLETS

Chemical name Bromo-chloro-5,5-dimethylhydantoin

Product number 100405, 100406, 100407, 100412, 100414, 100794, 101187

CAS number 32718-18-6

Recommended use of the chemical and restrictions on use

Application Biocides for water treatment.

Details of the supplier of the safety data sheet

Supplier BWA Water Additives US LLC

1979 Lakeside Parkway Suite 925, Tucker, GA30084

USA

T: +1 800 600 4523 T: +1 678 802 3050

E: msds@wateradditives.com

Emergency telephone number

Emergency telephone CHEMTREC Phone: 1-800-424-9300

2. Hazard(s) identification

Classification of the substance or mixture

Physical hazards Ox. Sol. 3 - H272

Health hazards Acute Tox. 4 - H302 Skin Corr. 1C - H314 Eye Dam. 1 - H318 Skin Sens. 1 - H317

Environmental hazards Aquatic Acute 1 - H400

Label elements

Pictogram









Signal word

Danger

Hazard statements H272 May intensify fire; oxidizer.

H302 Harmful if swallowed.

H314 Causes severe skin burns and eye damage.

H317 May cause an allergic skin reaction.

H400 Very toxic to aquatic life.



BROMICIDE TABLETS

Precautionary statements P210 Keep away from heat, sparks, open flames and hot surfaces. No smoking.

P220 Keep away from combustible materials.

P221 Take any precaution to avoid mixing with combustibles.

P260 Do not breathe vapor/ spray. P261 Avoid breathing vapor/ spray.

P264 Wash contaminated skin thoroughly after handling. P270 Do not eat, drink or smoke when using this product.

P272 Contaminated work clothing must not be allowed out of the workplace.

P273 Avoid release to the environment.

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

P301+P310 If swallowed: Immediately call a poison center/ doctor. P301+P330+P331 If swallowed: Rinse mouth. Do NOT induce vomiting.

P302+P352 If on skin: Wash with plenty of water.

P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse

skin with water/ shower.

P304+P340 If inhaled: Remove person to fresh air and keep comfortable for breathing.

P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact

lenses, if present and easy to do. Continue rinsing.

P321 Specific treatment (see medical advice on this label).

P333+P313 If skin irritation or rash occurs: Get medical advice/ attention.

P362+P364 Take off contaminated clothing and wash it before reuse.

P363 Wash contaminated clothing before reuse.

P370+P378 In case of fire: Use foam, carbon dioxide, dry powder or water fog to extinguish.

P391 Collect spillage. P405 Store locked up.

P501 Dispose of contents/ container in accordance with national regulations.

Contains Bromo-chloro-5,5-dimethylhydantoin

3. Composition/information on ingredients

Mixtures

Bromo-chloro-5,5-dimethylhydantoin

96.0%

CAS number: 32718-18-6
M factor (Acute) = 1

Classification

Ox. Sol. 3 - H272 Acute Tox. 4 - H302 Skin Corr. 1C - H314 Eye Dam. 1 - H318 Skin Sens. 1 - H317 Aquatic Acute 1 - H400

Inert ingredients 4.0%

CAS number: —

Classification

Not Classified

The Full Text for all Hazard Statements are Displayed in Section 16.

Composition comments

1-bromo-3-chloro-5,5-dimethylhydantoin



BROMICIDE TABLETS

4. First-aid measures

Description of first aid measures

Inhalation Move affected person to fresh air and keep warm and at rest in a position comfortable for

breathing. Get medical attention. Show this Safety Data Sheet to the medical personnel.

Ingestion Do not induce vomiting. Give plenty of water to drink. Rinse mouth thoroughly with water.

Never give anything by mouth to an unconscious person. Get medical attention. Show this

Safety Data Sheet to the medical personnel.

Skin Contact Remove contaminated clothing. Rinse immediately with plenty of water. Continue to rinse for

at least 15 minutes. Get medical attention. Show this Safety Data Sheet to the medical

personnel.

Eye contact Rinse immediately with plenty of water. Remove any contact lenses and open eyelids wide

apart. Continue to rinse for at least 15 minutes. Get medical attention. Show this Safety Data

Sheet to the medical personnel.

Most important symptoms and effects, both acute and delayed

Inhalation Dust may irritate the respiratory system.

Ingestion May cause stomach pain or vomiting. May cause chemical burns in mouth and throat. Due to

the physical nature of this material it is unlikely that swallowing will occur.

Skin contact Chemical burns. Burning pain and severe corrosive skin damage.

Eye contact Severe irritation, burning and tearing.

Indication of immediate medical attention and special treatment needed

Notes for the doctor If lavage is performed suggest

If lavage is performed suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. The decision of whether to induce vomiting or not should be made by a physician. Chemical eye burns may require extended irrigation. Obtain prompt consultation preferably from an opthalmologist. If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical

condition of the patient.

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media Extinguish with the following media: Water spray, fog or mist. Alcohol-resistant foam.

Unsuitable extinguishing

media

Carbon dioxide (CO2). Dry chemicals

Special hazards arising from the substance or mixture

Specific hazards Toxic gases/vapors/fumes of: Bromine. Chlorine. Oxides of the following substances: Carbon.

Nitrogen. Thermal decomposition or combustion products may include the following

substances: Toxic gases or vapors.

Advice for firefighters

Protective actions during

firefighting

Move containers from fire area if it can be done without risk. Control run-off water by

containing and keeping it out of sewers and watercourses.

Special protective equipment for firefighters

Leave danger zone immediately. Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures



BROMICIDE TABLETS

Personal precautions Follow precautions for safe handling described in this safety data sheet. For personal

protection, see Section 8.

Environmental precautions

Environmental precautions Avoid release to the environment. To prevent release, place container with damaged side up.

Methods and material for containment and cleaning up

Methods for cleaning up Provide adequate ventilation. Contain spillage with sand, earth or other suitable non-

combustible material. Avoid the spillage or runoff entering drains, sewers or watercourses. Collect spillage for reclamation or disposal in sealed containers via a licensed waste contractor. Containers with collected spillage must be properly labeled with correct contents and hazard symbol. Wash thoroughly after dealing with a spillage. Avoid generation and

spreading of dust. Avoid contact with water.

Reference to other sections For personal protection, see Section 8. For waste disposal, see section 13.

7. Handling and storage

Precautions for safe handling

Usage precautions Provide adequate ventilation. Avoid inhalation of vapors. Use approved respirator if air

contamination is above an acceptable level. Do not use in confined spaces without adequate ventilation and/or respirator. Avoid spilling. Avoid contact with skin and eyes. Avoid contact with the following materials: Acids. Moisture. Avoid handling which leads to dust formation.

Conditions for safe storage, including any incompatibilities

Storage precautions Store in tightly-closed, original container in a dry, cool and well-ventilated place. Keep

container tightly closed. Protect from light. Keep away from heat, sparks and open flame.

Store away from the following materials: Reducing agents.

Storage class Oxidizer storage.

Specific end uses(s)

Specific end use(s) The identified uses for this product are detailed in Section 1.2.

8. Exposure Controls/personal protection

Ingredient comments No exposure limits known for ingredient(s).

Exposure controls

Protective equipment





Appropriate engineering controls All handling should only take place in well-ventilated areas.

Eye/face protection The following protection should be worn: Chemical splash goggles or face shield.

Hand protection Selection of a suitable glove depends on work conditions and whether the product is present on its own or in combination with other substances. Wear protective gloves made of the

following material: Butyl rubber. Neoprene. Nitrile rubber. Polyethylene. Polyvinyl chloride (PVC). Gloves should be replaced immediately if signs of degradation are observed.

Other skin and body protection

Wear appropriate clothing to prevent any possibility of skin contact. Wear a suitable dust

mask. Wear apron or protective clothing in case of contact.



BROMICIDE TABLETS

Hygiene measures Use engineering controls to reduce air contamination to permissible exposure level. Provide

eyewash station. No specific hygiene procedures recommended but good personal hygiene practices should always be observed when working with chemical products. Contaminated

clothing should be placed in a closed container for disposal or decontamination.

Respiratory protection Wear a suitable dust mask.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Appearance Tablet.

Color White/off-white. Odor Slight. Halogen

Odor threshold Not available. Not available.

pΗ pH (diluted solution): 3.5 @ 0.15 %

Melting point 156 - 162°C Initial boiling point and range Not known.

Freezing Point

Flash point Not applicable. Evaporation rate Not known. **Evaporation factor** Not applicable. Upper/lower flammability or Not available.

explosive limits

0.0038 Pa @ °C Vapor pressure Not available. Vapor density Relative density Not applicable.

Bulk density 0.9 kg/l

Solubility(ies) 0.15 @ °C Slightly soluble in water.

Partition coefficient log Pow: 0.35 Auto-ignition temperature Not available. Viscosity Not known

Explosive properties There are no chemical groups present in the product that are associated with explosive

properties.

Oxidizing properties The product contains a substance classified as oxidizing. Keep away from flammable and

combustible materials.

Molecular weight 241.47

Molecular Formula C5 H6 Br Cl N2 O2

10. Stability and reactivity

Reactivity This material has oxidising properties.

Stability Stable at normal ambient temperatures. Avoid the following conditions: Moisture.



BROMICIDE TABLETS

Possibility of hazardous

reactions

Will not polymerize.

Conditions to avoid Generates toxic gas in contact with acid. Avoid excessive heat for prolonged periods of time.

Avoid heat, flames and other sources of ignition.

Materials to avoid Strong acids. Strong reducing agents. Strong alkalis.

Hazardous decomposition

products

Toxic gases/vapors/fumes of: Hydrogen bromide (HBr). Bromine. Hydrogen chloride (HCl).

Chlorine. Oxides of the following substances: Carbon. Nitrogen.

11. Toxicological information

Information on toxicological effects

Toxicological effects Ames Test negative

Other health effects There is no evidence that the product can cause cancer.

Supplemental Toxicological

Information

Acute toxicity - oral

Acute toxicity oral (LD₅

mg/kg)

578.0

Species Rat
ATE oral (mg/kg) 520.83

Acute toxicity - dermal

Acute toxicity dermal (LD60

mg/kg)

2,000.0

Species Rabbit

Germ cell mutagenicity

Genotoxicity - in vitro Ames test: Negative.

Inhalation May cause respiratory system irritation.

Ingestion Harmful if swallowed.

Skin Contact Causes burns. May cause sensitisation by skin contact.

Eye contact Causes burns.

Acute and chronic health

hazards

Causes severe burns. May cause sensitisation by skin contact.

Route of entry Skin and/or eye contact Ingestion.

12. Ecological Information

Ecotoxicity The product contains a substance which is very toxic to aquatic organisms.

Toxicity

Acute toxicity - fish LC50, 96 hours: 0.87 mg/l, Onchorhynchus mykiss (Rainbow trout)

LC50, 96 hours: 0.87 mg/l, Fish



BROMICIDE TABLETS

Acute toxicity - aquatic invertebrates EC50, 48 hours: 0.46 mg/l, Daphnia magna EC50, 48 hours: 0.46 mg/l, Daphnia magna

Persistence and degradability

Persistence and degradability Halogens will dissociate in water leaving DMH. DMH is readily biodegradable in a CO2

Evolution study and passes the 10-day window criteria. DMH has also been shown to be

rapidly degraded in a water/sediment system.

Chemical oxygen demand 1.005 g O₂/g substance

Bioaccumulative potential

Bio-Accumulative Potential Low bioaccumulation potential

Partition coefficient log Pow: 0.35

Mobility in soil

Mobility No information available.

Results of PBT and vPvB assessment

Results of PBT and vPvB

assessment

This substance is not classified as PBT or vPvB according to current EU criteria.

Other adverse effects

Acute Toxicity. Lc50 96 Hours, >640 American Oyster

Mg/L

13. Disposal considerations

Waste treatment methods

General information When handling waste, the safety precautions applying to handling of the product should be

considered.

Disposal methodsDispose of waste to licensed waste disposal site in accordance with the requirements of the

local Waste Disposal Authority. Absorb in vermiculite, dry sand or earth and place into containers. Dispose of waste via a licensed waste disposal contractor. Liquid material should be incinerated. Material absorbed onto sand or earth should be disposed of as solid waste in accordance with local regulations. Empty packaging may contain product residues and due

consideration should be given prior to disposal.

Waste class 07 01 99

14. Transport information

UN Number

UN No. (TDG) 3085 UN No. (IMDG) 3085 UN No. (ICAO) 3085 UN No. (DOT) 3085

UN proper shipping name

Proper shipping name (TDG) OXIDISING SOLID, CORROSIVE, N.O.S., (contains bromo-chloro-dimethylhydantoin) 5.1(8),

PGIII, MARINE POLLUTANT

Proper shipping name (IMDG) OXIDISING SOLID, CORROSIVE, N.O.S., (contains bromo-chloro-dimethylhydantoin) 5.1(8),

PGIII, MARINE POLLUTANT



Revision date: 3/28/2016

BROMICIDE TABLETS

Revision: 9

Proper shipping name (ICAO) OXIDISING SOLID, CORROSIVE, N.O.S., (contains bromo-chloro-dimethylhydantoin) 5.1(8),

PGIII, MARINE POLLUTANT

Proper shipping name (DOT) OXIDISING SOLID, CORROSIVE, N.O.S., (contains bromo-chloro-dimethylhydantoin) 5.1(8),

PGIII, MARINE POLLUTANT

Transport hazard class(es)

TDG class 5.1+8 TDG label(s) 5.1+8 **IMDG Class** 5.1+8 ICAO class/division 5.1 ICAO subsidiary risk 8

Transport labels





Packing group

TDG Packing Group 111 IMDG packing group 111 ICAO packing group Ш DOT packing group Ш

Environmental hazards

Environmentally Hazardous Substance



Special precautions for user

EmS F-A, S-Q

Transport in bulk according to Not applicable. Annex II of MARPOL 73/78 and the IBC Code

Classification Code (Adr)

OC2

15. Regulatory information

Regulatory Status This chemical is a pesticide product registered by the Environmental Protection Agency and is

subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label: DANGER Avoid contact with eyes, skin and clothing. EPA Reg. No.

83451-4

Regulatory References 29 CFR 1910.1010 Federal Regulations (OSHA Standard)

Canadian Regulatory Status PMRA PCP No. 31855

8/9



Revision date: 3/28/2016 Revision: 9

BROMICIDE TABLETS

16. Other information

General information For advice on chemical emergencies, spillages, fires or first aid in relation to this product

please contact the relevant emergency number below: EU/English Speakers - +44 (0) 1235 239 670 (NCEC) Arabic Speakers - +44 (0) 1235 239 671 Asia/Pacific countries - +65 3158

1074 Within Mainland China: +86 532 8388 9090 (NRCC).

To/From China: +86 10 5100 3039 (NCEC)

Revision comments Section 15 revision, added US regulatory status and EPA Reg. No.

Issued by BWA Water Additives Regulatory Group, +44(0)1618646699

Revision date 3/28/2016

Revision 9

SDS No. 11306

Hazard statements in full H272 May intensify fire; oxidizer.

H302 Harmful if swallowed.

H314 Causes severe skin burns and eye damage. H317 May cause an allergic skin reaction.

H318 Causes serious eye damage. H400 Very toxic to aquatic life.

KIWA Certification

NSF Non Food Program

NSF/ANSI Standard 60

For safety reasons it is IMPERATIVE that customers:-

^{1.} Ensure that all those within their control who use the products are supplied with all relevant information contained within the Safety Data Sheet and Technical Bulletin concerning the applications for which the product is designed and any instructions and warnings contained therein.

^{2.} Consult BWA Water Additives before using or supplying the product for any other applications. The information contained herein is based on the present state of our knowledge and is intended to describe our products from the point of view of safety requirements. It should not therefore be construed as guaranteeing specific properties.



HACH 1407028





SAFETY DATA SHEET

Issue Date 09-Jun-2016 Revision Date 15-Jan-2018 Version 2.2 Page 1/15

1. IDENTIFICATION

Product identifier

Sulfuric Acid Solution 19.2 N **Product Name**

Other means of identification Product Code(s) 203832

Safety data sheet number M00471

UN/ID no

Recommended use of the chemical and restrictions on use

Recommended Use Standard solution. Laboratory Use.

UN2796

Uses advised against None. Restrictions on use

Details of the supplier of the safety data sheet

Manufacturer Address
Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

Emergency telephone number +1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Corrosive to metals	Category 1
Skin corrosion/irritation	Category 1
Serious eye damage/eye irritation	Category 1
Respiratory sensitization	Figure Control State and Collection Collection
Skin sensitization	
Mutagenicity	
Carcinogenicity	
Reproductive toxicity	
Specific target organ toxicity (single exposure)	
Specific target organ toxicity (repeated exposure)	

Hazards not otherwise classified (HNOC)

Data insufficient for GHS classification but significant enough for mention suggests:
CANCER HAZARD. STRONG INORGANIC ACID MISTS CONTAINING SULFURIC ACID CAN CAUSE CANCER Inhalation of low concentrations of sulfuric acid may result in airway irritation such as cough and shortness of breath; high concentrations may result in acute effects such as cough.

EN / AGHS Page 1/15



Product Name Sulfuric Acid Solution 19.2 N Revision Date 15-Jan-2018

Page 2/15

Label elements

Signal word - Danger



Hazard statements

H290 - May be corrosive to metals

H314 - Causes severe skin burns and eye damage

Precautionary statements

P260 - Do not breathe dust/fume/gas/mist/vapors/spray

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting

P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower

P363 - Wash contaminated clothing before reuse

P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

P405 - Store locked up

P501 - Dispose of contents/ container to an approved waste disposal plant

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P310 - Immediately call a POISON CENTER or doctor/physician

P234 - Keep only in original container

P390 - Absorb spillage to prevent material damage

Other Hazards Known

Harmful to aquatic life

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable

Mixture

Percent ranges are used where confidential product information is applicable.

Chemical name	CAS No.	Percent Range	HMRIC #
Sulfuric acid	7664-93-9	40 - 50%	

EN / AGHS Page 2/15



Product Name Sulfuric Acid Solution 19.2 N

Revision Date 15-Jan-2018

Page 3/15

4. FIRST AID MEASURES

Description of first aid measures

General advice Show this safety data sheet to the doctor in attendance. Immediate medical attention is

required.

Inhalation Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical

attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. Get immediate medical

advice/attention.

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Remove contact lenses, if present and easy to do. Continue rinsing. Keep eye wide open while rinsing. Do not rub affected area. Get immediate medical advice/attention.

Skin contact Wash off immediately with soap and plenty of water while removing all contaminated

clothes and shoes. Get immediate medical advice/attention.

Ingestion Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth

to an unconscious person. Do NOT induce vomiting. Get immediate medical

advice/attention.

Self-protection of the first aider Avoid contact with skin, eyes or clothing. Ensure that medical personnel are aware of the

material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid direct contact with skin. Use barrier to give mouth-to-mouth

resuscitation.

Most important symptoms and effects, both acute and delayed

Symptoms Burning sensation.

Indication of any immediate medical attention and special treatment needed

Note to physicians Product is a corrosive material. Use of gastric lavage or emesis is contraindicated.

Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood

pressure may occur with moist rales, frothy sputum, and high pulse pressure.

5. FIRE-FIGHTING MEASURES

surrounding environment.

Unsuitable Extinguishing Media Caution: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the

chemical

The product causes burns of eyes, skin and mucous membranes. Thermal decomposition

can lead to release of irritating gases and vapors.

Hazardous combustion products May emit toxic and corrosive fumes.

Special protective equipment for

fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout

gear.

6. ACCIDENTAL RELEASE MEASURES

EN / AGHS Page 3/15



Product Code(s) 203832 Issue Date 09-Jun-2016

Product Name Sulfuric Acid Solution 19.2 N

Revision Date 15-Jan-2018

Page 4/15

U.S. Notice

Version 2.2

Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Outside of the US, only persons properly qualified according to state or local regulations

should respond to a spill involving chemicals.

Personal precautions, protective equipment and emergency procedures

Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal Personal precautions

protective equipment as required. Attention! Corrosive material. Evacuate personnel to

safe areas. Keep people away from and upwind of spill/leak.

Other Information Refer to protective measures listed in Sections 7 and 8.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Should not be released into the **Environmental precautions**

environment. Do not allow to enter into soil/subsoil. Prevent product from entering drains.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Pick up and transfer to properly labeled containers. Methods for cleaning up

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

Reference to other sections See section 8 for more information. See section 13 for more information.

7. HANDLING AND STORAGE

Precautions for safe handling

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with Advice on safe handling

skin, eyes or clothing. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation. Do not eat, drink or smoke when using this product. Take off contaminated

clothing and wash before reuse.

Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from Storage Conditions

moisture. Store locked up. Keep out of the reach of children. Store away from other

materials.

Flammability class Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Sulfuric acid	TWA: 0.2 mg/m ³	TWA: 1 mg/m ³	IDLH: 15 mg/m ³
CAS#: 7664-93-9		(vacated) TWA: 1 mg/m ³	TWA: 1 mg/m ³

EN / AGHS Page 4/15



Product Code(s) 203832 Issue Date 09-Jun-2016

Version 2.2

Product Name Sulfuric Acid Solution 19.2 N

Revision Date 15-Jan-2018

Page 5/15

Appropriate engineering controls

Engineering Controls

Showers

Eyewash stations Ventilation systems.

Individual protection measures, such as personal protective equipment

Respiratory protection

No protective equipment is needed under normal use conditions. If exposure limits are

exceeded or irritation is experienced, ventilation and evacuation may be required.

Hand Protection Wear suitable gloves. Impervious gloves.

Eyelface protection Face protection shield.

Skin and body protection Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron.

General Hygiene Considerations Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this

product. Regular cleaning of equipment, work area and clothing is recommended. Avoid contact with skin, eyes or clothing. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Contaminated work clothing should not be allowed out of the workplace. Wash hands before breaks and immediately after handling the product.

colorless

Local authorities should be advised if significant spillages cannot be contained. Do not Environmental exposure controls

allow into any sewer, on the ground or into any body of water.

Thermal hazards None under normal processing

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state

Liquid Appearance aqueous solution Color

Odor Acidic Odor threshold No data available

Property Values Remarks • Method

No data available Molecular weight

рΗ < 0.5

Melting point/freezing point ~ -33 °C / -27 °F Estimation based on theoretical

calculation

Boiling point / boiling range ~ 109 °C / 228 °F Estimation based on theoretical

calculation

Estimation based on theoretical Evaporation rate 1.19 (water = 1)

calculation

20.477 mm Hg / 2.73 kPa at 25 °C / 77 °F Vapor pressure Estimation based on theoretical

calculation

Vapor density (air = 1) 0.03 (air = 1)

Specific gravity (water = 1 / air = 1) 1.535

Partition Coefficient (n-octanol/water) Not applicable Soil Organic Carbon-Water Partition Not applicable

Coefficient

EN / AGHS



Product Code(s) 203832 Product Name Sulfuric Acid Solution 19.2 N

Issue Date 09-Jun-2016 Revision Date 15-Jan-2018

Version 2.2 Page 6/15

Autoignition temperature

Decomposition temperature

No data available

Solubility(ies)

Water solubility

Water solubility classification	Water solubility_	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Solubility in other solvents

Chemical Name	Solubility classification	<u>Solubility</u>	Solubility Temperature
Acid	Soluble	> 1000 mg/L	25 °C / 77 °F

Other Information

Metal Corrosivity

Classified as corrosive to metal according to GHS criteria

Steel Corrosion Rate17.78 mm/yr / 0.7 in/yrAluminum Corrosion Rate12.7 mm/yr / 0.5 in/yr

Volatile Organic Compounds (VOC) Content

Chemical name	CAS No.	Volatile organic compounds (VOC) content	CAA (Clean Air Act)	
Sulfuric acid	7664-93-9	No data available	=	

Explosive properties

Upper explosion limitNo data availableLower explosion limitNo data available

Flammable properties

Flash point No data available
Method No information available

Flammability Limit in Air

Upper flammability limit:
Lower flammability limit:
No data available
No data available

Oxidizing properties
No data available.

Bulk density Not applicable

Particle Size No information available

Particle Size Distribution No information available

10. STABILITY AND REACTIVITY

EN / AGHS Page 6/15



Product Name Sulfuric Acid Solution 19.2 N Revision Date 15-Jan-2018

Page 7/15

Reactivity Not applicable.

Chemical stability

Stable under normal conditions Stability

Explosion data

Sensitivity to Mechanical Impact None Sensitivity to Static Discharge

Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing.

Hazardous polymerization None under normal processing.

Conditions to avoid

Conditions to avoid Exposure to air or moisture over prolonged periods.

Incompatible materials

Incompatible materials Oxidizing agent. Acids. Bases.

Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information

Inhalation Specific test data for the substance or mixture is not available. Corrosive by inhalation.

(based on components). Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs.

Pulmonary edema can be fatal.

Eye contact Specific test data for the substance or mixture is not available. Causes burns. (based on

components). Corrosive to the eyes and may cause severe damage including blindness.

Causes serious eye damage. May cause irreversible damage to eyes.

Skin contact Specific test data for the substance or mixture is not available. May cause irritation.

Specific test data for the substance or mixture is not available. Causes burns. (based on Ingestion

components). Ingestion causes burns of the upper digestive and respiratory tracts. May cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung

damage if swallowed. May be fatal if swallowed and enters airways.

Redness. Burning. May cause blindness. Coughing and/ or wheezing. Symptoms 5

Aggravated Medical Conditions Eye disorders. Skin disorders. Respiratory disorders. Preexisting eye disorders. Teeth.

Toxicologically synergistic None known.

products

Toxicokinetics, metabolism and See ingredients information below.

distribution

Chemical name	Toxicokinetics, metabolism and distribution
Sulfuric acid	The corrosivity of sulfuric acid makes it difficult to assess its effects on metabolism. Its corrosivity is also the
EN / AGHS	Page 7/15



Product Name Sulfuric Acid Solution 19.2 N

Revision Date 15-Jan-2018

Page 8/15

Chemical name	Toxicokinetics, metabolism and distribution
(40 - 50%)	main contributor to acute deaths, therefore it is not classified for acute toxicity.
CAS#: 7664-93-9	*

Product Acute Toxicity Data

 Oral Exposure Route
 No data available

 Dermal Exposure Route
 No data available

 Inhalation (Dust/Mist) Exposure Route
 No data available

 Inhalation (Vapor) Exposure Route
 No data available

 Inhalation (Gas) Exposure Route
 No data available

Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

Acute Toxicity Estimations (ATE)

ATEmix (oral)	No information available
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	No information available
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

Ingredient Acute Toxicity Data

Oral Exposure Route					
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (40 - 50%) CAS#: 7664-93-9	Rat LD50	2140 mg/kg	None reported	None reported	IUCLID (The International Uniform Chemical Information Database)

Dermal Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
If available, see data below
If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (40 - 50%) CAS#: 7664-93-9	Rat LC50	0.510 mg/L	None reported	None reported	LOLI

Inhalation (Gas) Exposure Route

If available, see data below

Product Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
No data available
No data available
No data available

Ingredient Specific Target Organ Toxicity Single Exposure Data

 Oral Exposure Route
 If available, see data below

 Dermal Exposure Route
 If available, see data below

 Inhalation (Dust/Mist) Exposure Route
 If available, see data below

 Inhalation (Vapor) Exposure Route
 If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (40 - 50%) CAS#: 7664-93-9	Human TD∟∘	0.144 mg/L	5 minutes	Lungs, Thorax, or Respiration Dyspnea	RTECS (Registry of Toxic Effects of Chemical Substances)

Inhalation (Gas) Exposure Route If available, see data below

Aspiration toxicity

EN / AGHS Page 8/15



Product Name Sulfuric Acid Solution 19.2 N **Revision Date** 15-Jan-2018

Page 9/15

No data available

Product Skin Corrosion/Irritation Data

No data available.

Ingredient Skin Corrosion/Irritation Data

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sulfuric acid (40 - 50%) CAS#: 7664-93-9	Existing human experience	Human	None reported	None reported	Corrosive to skin	HSDB (Hazardous Substances Data Bank)

Product Serious Eye Damage/Eye Irritation Data

No data available.

Ingredient Eye Damage/Eye Irritation Data

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sulfuric acid (40 - 50%) CAS#: 7664-93-9	Existing human experience	Human	None reported	None reported	Corrosive to eyes	HSDB (Hazardous Substances Data Bank)

Sensitization Information

Product Sensitization Data

Skin Sensitization Exposure Route
Respiratory Sensitization Exposure Route
No data available.

Ingredient Sensitization Data

 Skin Sensitization Exposure Route
 If available, see data below.

 Respiratory Sensitization Exposure Route
 If available, see data below.

Chronic Toxicity Information

Product Specific Target Organ Toxicity Repeat Dose Data

 Oral Exposure Route
 No data available.

 Dermal Exposure Route
 No data available.

 Inhalation (Dust/Mist) Exposure Route
 No data available.

 Inhalation (Vapor) Exposure Route
 No data available.

 Inhalation (Gas) Exposure Route
 No data available.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below

Chemical name	Endpoint	Reported	Exposure	Toxicological effects	Key literature references and
	type	dose	time		sources for data
Sulfuric acid	Human	.003 mg/L	168 days	Musculoskeletal	RTECS (Registry of Toxic
(40 - 50%)	TCLo			Changes in teeth and	Effects of Chemical
CAS#: 7664-93-9				supporting structures	Substances)

Inhalation (Gas) Exposure Route If available, see data below

Product Carcinogenicity Data

 Oral Exposure Route
 No data available

 Dermal Exposure Route
 No data available

 Inhalation (Dust/Mist) Exposure Route
 No data available

EN / AGHS Page 9/15



Product Code(s) 203832 Issue Date 09-Jun-2016

Version 2.2

Product Name Sulfuric Acid Solution 19.2 N

Revision Date 15-Jan-2018

Page 10 / 15

Inhalation (Vapor) Exposure RouteNo data availableInhalation (Gas) Exposure RouteNo data available

Ingredient Carcinogenicity Data

Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
Sulfuric acid	7664-93-9	A2	Group 1	Known	Χ

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	A2 - Suspected Human Carcinogen
IARC (International Agency for Research on Cancer)	Group 1 - Carcinogenic to Humans
NTP (National Toxicology Program)	Known - Known Carcinogen
OSHA (Occupational Safety and Health Administration of the US Department of	X - Present
Labor)	

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Germ Cell Mutagenicity invitro Data

No data available.

Ingredient Germ Cell Mutagenicity invitro Data

If available, see data below

Chemical name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Sulfuric acid (40 - 50%) CAS#: 7664-93-9	Cytogenetic analysis	Hamster ovary	4 mmol/L	None reported	Positive test result for mutagenicity	No information available

Product Germ Cell Mutagenicity invivo Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
No data available
No data available
No data available

Ingredient Germ Cell Mutagenicity invivo Data

Oral Exposure Route
Dermal Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
If available, see data below
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
If available, see data below

Product Reproductive Toxicity Data

Oral Exposure RouteNo data availableDermal Exposure RouteNo data availableInhalation (Dust/Mist) Exposure RouteNo data availableInhalation (Vapor) Exposure RouteNo data availableInhalation (Gas) Exposure RouteNo data available

Ingredient Reproductive Toxicity Data

 Oral Exposure Route
 If available, see data below

 Inhalation (Dust/Mist) Exposure Route
 If available, see data below

 Inhalation (Vapor) Exposure Route
 If available, see data below

Chemical name	Endpoint	Reported	Exposure	Toxicological effects	Key literature references and
	type	dose	time	*****	sources for data
Sulfuric acid	Rabbit	.02 mg/L	7 hours	Specific Developmental	No information available

EN / AGHS Page 10/15



Product Code(s) 203832 Issue Date 09-Jun-2016

Version 2.2

Product Name Sulfuric Acid Solution 19.2 N

Revision Date 15-Jan-2018

Page 11 / 15

(40 - 50%)	TC _{Lo}	Abnormalities
CAS#: 7664-93-9		Musculoskeletal system
Inhalation (Gas) Exp	osure Route	If available, see data below

*

12. ECOLOGICAL INFORMATION

Ecotoxicity

Product Ecological Data

Aquatic toxicity

FishNo data availableCrustaceaNo data availableAlgaeNo data available

Ingredient Ecological Data

Aquatic toxicity

Fish If available, see ingredient data below Crustacea If available, see ingredient data below Algae No data available

Other Information

Persistence and degradability

Product Biodegradability Data

No data available.

Ingredient Biodegradability Data

Bioaccumulation

Product Bioaccumulation Data

No data available.

Partition Coefficient (n-octanol/water) Not applicable

Ingredient Bioaccumulation Data

Mobility

Soil Organic Carbon-Water Partition Coefficient Not applicable

Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Other adverse effects
No information available.

	13. DISPOSAL CONSIDERATIONS	
EN / AGHS		Page 11/15



Product Code(s) 203832 Product Name Sulfuric Acid Solution 19.2 N

Issue Date 09-Jun-2016 Revision Date 15-Jan-2018

Version 2.2 Page 12 / 15

Waste treatment methods

Waste from residues/unused

products

Dispose of in accordance with local regulations. Dispose of waste in accordance with

environmental legislation.

Contaminated packaging Do not reuse empty containers.

D002 **US EPA Waste Number**

Special instructions for disposal Work in an approved fume hood. Dilute material with excess water making a weaker than

5% solution. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Open cold water tap completely, slowly pour the reacted material to the drain.

Allow cold water to run for 5 minutes to completely flush the system.

14. TRANSPORT INFORMATION

U.S. DOT

UN2796 UN/ID no

Proper shipping name Sulfuric acid solution

Hazard Class 8 11

Packing Group

UN2796, Sulfuric acid solution, 8, II Description

Emergency Response Guide

Number

TDG

UN/ID no UN2796 Proper shipping name Battery fluid, acid

Hazard Class

Packing Group

Description UN2796, Battery fluid, acid, 8, II

<u>IATA</u>

UN/ID no UN2796

Proper shipping name Sulphuric acid solution

Hazard Class 8 **Packing Group** 11 **ERG Code** 8L

Description UN2796, Sulphuric acid solution, 8, II

IMDG

UN/ID no UN2796

Proper shipping name Sulphuric acid solution

Hazard Class 8 **Packing Group** 11 EmS-No

Description UN2796, Sulphuric acid solution, 8, II

Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods.

If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

EN / AGHS Page 12/15



Product Code(s) 203832 Product Name Sulfuric Acid Solution 19.2 N

Issue Date 09-Jun-2016 Revision Date 15-Jan-2018

Version 2.2 Page 13/15

National Inventories

TSCA Complies Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EINECS/ELINCS Complies **ENCS** Complies **IECSC** Complies **KECL** Complies PICCS Complies TCSI Complies AICS Complies **NZIoC** Complies

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substances Inventory

AICS - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical name	SARA 313 - Threshold Values %
Sulfuric acid (CAS #: 7664-93-9)	1.0

SARA 311/312 Hazard Categories

TO COLINGIE HAZAIA CALCHOLICS	
Acute health hazard	Yes
Chronic Health Hazard	Yes
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sulfuric acid 7664-93-9	1000 lb	-	-	Х

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

Chemical name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Sulfuric acid	1000 lb	1000 lb	RQ 1000 lb final RQ
7664-93-9			Table 1
EN / AGHS			Page 13 / 15



Product Name Sulfuric Acid Solution 19.2 N

Revision Date 15-Jan-2018

Page 14/15

	RQ 454 kg final RQ

U.S. - DEA (Drug Enforcement Administration) List I & List II

Chemical name	U.S DEA (Drug Enforcement Administration) - List I or Precursor	U.S DEA (Drug Enforcement Administration) - List II or Essential
	Chemicals	Chemicals
Sulfuric acid (40 - 50%)	Not Listed	50 gallon Export Volume (exports, transshipments and international
CAS#: 7664-93-9		transactions to designated countries)

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Sulfuric acid	X	X	X
7664-93-9			

U.S. EPA Label Information

Chemical name	FIFRA	FDA
Sulfuric acid	180.0910	21 CFR 184.1095

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Special Comments

None

Additional information

Global Automotive Declarable Substance List (GADSL)

Not applicable

NFPA and HMIS Classifications

NFPA	Health hazards - 3	Flammability - 0	Instability - 0	Physical and Chemical Properties -
HMIS	Health hazards - 3	Flammability - 0	Physical Hazards - 0	Personal protection - X - See section 8 for more information

Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH Immediately Dangerous to Life or Health

ACGIH (American Conference of Governmental Industrial Hygienists)

NDF no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

EN / AGHS	Page 14/15



Product Code(s) 203832 Product Name Sulfuric Acid Solution 19.2 N

Issue Date 09-Jun-2016 Revision Date 15-Jan-2018

Version 2.2 **Page** 15 / 15

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)

MAC Maximum Allowable Concentration Ceiling Ceiling Limit Value

X Listed Vacated These values have no official status. The only

binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state

regulations.

SKN*Skin designationSKN+Skin sensitizationRSP+Respiratory sensitization**Hazard DesignationCCarcinogenRReproductive toxicant

M mutagen

Prepared By Hach Product Compliance Department

 Issue Date
 09-Jun-2016

 Revision Date
 15-Jan-2018

Revision Note None

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY@2017

End of Safety Data Sheet

EN / AGHS Page 15/15



HACH 203832





SAFETY DATA SHEET

Issue Date 25-Apr-2018 Revision Date 25-Apr-2018 Version 8.400001 Page 1/15

1. IDENTIFICATION

Product identifier

Product Name DPD Free Chlorine Reagent

Other means of identification

 Product Code(s)
 1407099

 Safety data sheet number
 M00109

HMRIC# HMIRA Registry Number 9935 Filed 2016-04-11

Recommended use of the chemical and restrictions on use

Recommended Use Laboratory Use. Determination of Free Chlorine.

Uses advised against None. Restrictions on use None.

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

Emergency telephone number

+1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Signal word - Warning



EN / AGHS Page 1/15



Product Name DPD Free Chlorine Reagent Revision Date 25-Apr-2018 Page 2 / 15

Hazard statements

H315 - Causes skin irritation H319 - Causes serious eye irritation

Precautionary statements

P302 + P352 - IF ON SKIN: Wash with plenty of soap and water

P332 + P313 - If skin irritation occurs: Get medical advice/attention

P362 - Take off contaminated clothing and wash before reuse

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P337 + P313 - If eye irritation persists: Get medical advice/attention

Other Hazards Known

Not applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable

Mixture

Chemical Family

Mixture.

Percent ranges are used where confidential product information is applicable.

Chemical name	CAS No.	Percent Range	HMRIC#
Sodium phosphate dibasic	7558-79-4	30 - 40%	~
Salt of N,N-Diethyl-p-Phenylenediamine	-	1 - 5%	-
Disodium EDTA	139-33-3	1 - 5%	=

EN / AGHS Page 2/15



Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 3/15

4. FIRST AID MEASURES

Description of first aid measures

General advice Show this safety data sheet to the doctor in attendance.

Inhalation Remove to fresh air. Get medical attention immediately if symptoms occur.

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep

eye wide open while rinsing. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists. Do not rub affected area.

Skin contact Wash off immediately with soap and plenty of water for at least 15 minutes. Get medical

attention if irritation develops and persists.

Ingestion Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth

to an unconscious person. Do NOT induce vomiting. Call a physician.

Self-protection of the first aider Avoid contact with skin, eyes or clothing.

Most important symptoms and effects, both acute and delayed

Symptoms Burning sensation.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. FIRE-FIGHTING MEASURES

surrounding environment.

Unsuitable Extinguishing Media Caution: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the

chemical

No information available.

Hazardous combustion products Carbon monoxide, Carbon dioxide. Phosphorus oxides. Nitrogen oxides.

Special protective equipment for

fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout

gear.

6. ACCIDENTAL RELEASE MEASURES

U.S. Notice Only persons properly qualified to respond to an emergency involving hazardous

substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and

guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations

should respond to a spill involving chemicals.

Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal

protective equipment as required.

Other Information Refer to protective measures listed in Sections 7 and 8.

EN / AGHS Page 3/15



Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 4/15

Environmental precautions

Environmental precautions Prevent further leakage or spillage if safe to do so.

Methods and material for containment and cleaning up

Methods for containmentPrevent further leakage or spillage if safe to do so.Methods for cleaning upPick up and transfer to properly labeled containers.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

Reference to other sections See section 8 for more information. See section 13 for more information.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with

skin, eyes or clothing. Do not eat, drink or smoke when using this product. Take off

contaminated clothing and wash before reuse.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place.

Flammability class Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines This product, as supplied, does not contain any hazardous materials with occupational

exposure limits established by the region specific regulatory bodies

Appropriate engineering controls

Engineering Controls Showers

Eyewash stations Ventilation systems.

Individual protection measures, such as personal protective equipment

exceeded or irritation is experienced, ventilation and evacuation may be required.

Hand Protection Wear suitable gloves. Impervious gloves.

Eyelface protection If splashes are likely to occur, wear safety glasses with side-shields.

Skin and body protection Wear suitable protective clothing. Long sleeved clothing

General Hygiene Considerations Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this

product. Avoid contact with skin, eyes or clothing.

Environmental exposure controls Local authorities should be advised if significant spillages cannot be contained. Do not

allow into any sewer, on the ground or into any body of water.

EN / AGHS Page 4/16

1% Solution



Product Code(s) 1407099 Issue Date 25-Apr-2018 Version 8.400001

Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 5/15

Thermal hazards None under normal processing.

PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state

Solid

Appearance powder Odor . Odorless Color White to light pink Odor threshold No data available

Values Property Remarks • Method

Molecular weight No data available

6.3 рΗ

Melting point/freezing point No data available No data available Boiling point / boiling range Evaporation rate Not applicable Vapor pressure Not applicable Vapor density (air = 1) Not applicable

Specific gravity (water = 1 / air = 1) 1.76

Partition Coefficient (n-octanol/water) log Kow ~ 0 Soil Organic Carbon-Water Partition log Koc ~ 0

Coefficient

Autoignition temperature No data available 110 °C / 230 °F Decomposition temperature Dynamic viscosity Not applicable Kinematic viscosity Not applicable

Solubility(ies) Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Solubility in other solvents

Acid Soluble > 1000 mg/l 25 °C / 77 °E	Chemical Name_	Solubility classification_	<u>Solubility</u>	Solubility Temperature
7.014	Acid	Soluble	> 1000 mg/L	25 °C / 77 °F

Other Information

Metal Corrosivity

Steel Corrosion Rate Not applicable Aluminum Corrosion Rate Not applicable

Volatile Organic Compounds (VOC) Content

Not applicable

EN / AGHS Page 5/15



Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 6/15

Chemical name	CAS No.	Volatile organic compounds (VOC) content	CAA (Clean Air Act)
Sodium phosphate dibasic	7558-79-4	No data available	-
Salt of N,N-Diethyl-p-Phenylenediamine	2=	Not applicable	-
Disodium EDTA	139-33-3	No data available	<u> </u>

Explosive properties

Upper explosion limitNo data availableLower explosion limitNo data available

Flammable properties

Flash point Not applicable

Flammability Limit in Air

Upper flammability limit:
Lower flammability limit:
No data available
No data available

Oxidizing properties
No data available.

Bulk density
No data available

Particle Size No information available

Particle Size Distribution No information available

10. STABILITY AND REACTIVITY

Reactivity

Not applicable.

Chemical stability

Stability Stable under normal conditions.

Explosion data

Sensitivity to Mechanical Impact None Sensitivity to Static Discharge None.

Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing.

<u>Hazardous polymerization</u> None under normal processing.

Conditions to avoid

Conditions to avoid None known based on information supplied.

Incompatible materials

Incompatible materials Strong acids. Strong bases. Strong oxidizing agents.

Hazardous Decomposition Products

Carbon dioxide. Carbon monoxide. Phosphorus oxides. Nitrogen oxides.

11. TOXICOLOGICAL INFORMATION

EN / AGHS Page 6/15



Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 7/15

Information on Likely Routes of Exposure

Product Information

Inhalation May cause irritation of respiratory tract.

Eye contact Irritating to eyes. Causes serious eye irritation.

Skin contact Causes skin irritation.

Ingestion Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Symptoms 5 4 1 Redness. May cause redness and tearing of the eyes.

Aggravated Medical Conditions Skin disorders. Eye disorders.

Toxicologically synergistic None known.

products

Toxicokinetics, metabolism and See ingredients information below.

distribution

Chemical name	Toxicokinetics, metabolism and distribution
Sodium phosphate dibasic (30 - 40%) CAS#: 7558-79-4	Phosphates are widely utilized by cells for metabolism of proteins, fats and carbohydrates.
SERVICE AND SERVICE AND A	EDTA and related compounds are poorly absorbed by the digestive system.

Product Acute Toxicity Data

Oral Exposure Route No data available **Dermal Exposure Route** No data available Inhalation (Dust/Mist) Exposure Route No data available Inhalation (Vapor) Exposure Route No data available Inhalation (Gas) Exposure Route No data available

Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

Acute Toxicity Estimations (ATE)

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)	19,881.00 mg/kg
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	No information available
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

Ingredient Acute Toxicity Data

Oral Exposure Route If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Salt of N,N-Diethyl-p-Phenyl enediamine (1 - 5%) CAS#: -	Rat LD50	695 mg/kg	None reported	None reported	Outside testing
Disodium EDTA	Rat	2000 mg/kg	None	None reported	RTECS (Registry of Toxic

EN / AGHS Page 7/15



Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 8/15

(1 - 5%) CAS#: 139-33-3	LD50		reported		Effects of Chemical Substances)
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sodium phosphate dibasic (30 - 40%) CAS#: 7558-79-4	Rat LD50	17000 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)
Disodium EDTA (1 - 5%) CAS#: 139-33-3	Rabbit LD50	2300 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)

If available, see data below **Dermal Exposure Route** Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route No data available **Dermal Exposure Route** No data available Inhalation (Dust/Mist) Exposure Route No data available Inhalation (Vapor) Exposure Route No data available Inhalation (Gas) Exposure Route No data available

Ingredient Specific Target Organ Toxicity Single Exposure Data
Oral Exposure Route If available, see data below **Dermal Exposure Route** If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route Inhalation (Gas) Exposure Route If available, see data below If available, see data below

Aspiration toxicity If available, see data below Kinematic viscosity

Not applicable

Product Skin Corrosion/Irritation Data

No data available.

Ingredient Skin Corrosion/Irritation Data

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sodium phosphate dibasic (30 - 40%) CAS#: 7558-79-4	Standard Draize Test	Rabbit	500 mg	24 hours	Skin irritant	RTECS (Registry of Toxic Effects of Chemical Substances)
Disodium EDTA (1 - 5%) CAS#: 139-33-3	Standard Draize Test	Rabbit	500 mg	20 hours	Not corrosive or irritating to skin	ECHA (The European Chemicals Agency)

Product Serious Eye Damage/Eye Irritation Data

No data available.

Ingredient Eye Damage/Eye Irritation Data

If available, see data below

k	i aranabio, oco data k	701011					
	Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
	Sodium phosphate dibasic	Standard Draize Test	Rabbit	500 mg	24 hours	Eye irritant	RTECS (Registry of Toxic Effects of

EN / AGHS Page 8/15



Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 9/15

(30 - 40%) CAS#: 7558-79-4						Chemical Substances)
Disodium EDTA (1 - 5%) CAS#: 139-33-3	Standard Draize Test	Rabbit	50 mg	None reported	Mild eye irritant	ECHA (The European Chemicals Agency)

Sensitization Information

Product Sensitization Data

 Skin Sensitization Exposure Route
 No data available.

 Respiratory Sensitization Exposure Route
 No data available.

Ingredient Sensitization Data

 Skin Sensitization Exposure Route
 If available, see data below.

 Respiratory Sensitization Exposure Route
 If available, see data below.

Chronic Toxicity Information

Product Specific Target Organ Toxicity Repeat Dose Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available.
No data available.
No data available.
No data available.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

Oral Exposure Route
Dermal Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route

Product Carcinogenicity Data

Oral Exposure Route

Dermal Exposure Route

Inhalation (Dust/Mist) Exposure Route

Inhalation (Vapor) Exposure Route

Inhalation (Gas) Exposure Route

No data available

No data available

No data available

No data available

Ingredient Carcinogenicity Data

Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
Sodium phosphate dibasic	7558-79-4	-	-	-	-
Salt of N,N-Diethyl-p-Phenylenedi amine		-	-	-	5 -4
Disodium EDTA	139-33-3	-	-	-	1.00

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply
NTP (National Toxicology Program)	Does not apply
OSHA (Occupational Safety and Health Administration of the US Department of	Does not apply
Labor)	

Oral Exposure Route If available, see data below
Dermal Exposure Route If available, see data below
Inhalation (Dust/Mist) Exposure Route If available, see data below
Inhalation (Vapor) Exposure Route If available, see data below
Inhalation (Gas) Exposure Route If available, see data below

EN / AGHS Page 9/15



Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 10 / 15

Product Germ Cell Mutagenicity invitro Data

No data available

Ingredient Germ Cell Mutagenicity invitro Data

If available, see data below

Chemical name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Disodium EDTA (1 - 5%) CAS#: 139-33-3	Cytogenetic analysis	Hamster lung	200 mg/L	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)

Product Germ Cell Mutagenicity invivo Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
No data available
No data available
No data available

Ingredient Germ Cell Mutagenicity invivo Data

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Reproductive Toxicity Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
No data available
No data available
No data available

Ingredient Reproductive Toxicity Data

Oral Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

12. ECOLOGICAL INFORMATION

Ecotoxicity

Product Ecological Data

Aquatic toxicity

FishNo data availableCrustaceaNo data availableAlgaeNo data available

Ingredient Ecological Data

Aquatic toxicity

Fish If available, see ingredient data below

Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Disodium EDTA	96 hours	Lepomis macrochirus	LC ₅₀	159 mg/L	Vendor SDS

EN / AGHS Page 10/15



Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 11 / 15

(1 - 5%) CAS#: 139-33-3						
Crustacea	Crustacea If available, see ingredient data below					
Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data	
Salt of N,N-Diethyl-p-Phenyl enediamine (1 - 5%) CAS#: -	48 Hours	Daphina magna	EC50	10.8 mg/L	Internal Data	
Algae		If av	⁄ailable, see i	ngredient data b	elow	
Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data	
Disodium EDTA (1 - 5%) CAS#: 139-33-3	72 Hours	None reported	EC50	10 mg/L	Vendor SDS	

Other Information

Persistence and degradability

Product Biodegradability Data

No data available.

Ingredient Biodegradability Data

Chemical name	Test method	Biodegradation	Exposure time	Results
Salt of N,N-Diethyl-p-Phenyl enediamine (1 - 5%) CAS#: -	None reported	None reported	None reported	Not determined

Bioaccumulation

Product Bioaccumulation Data

No data available.

Partition Coefficient (n-octanol/water)

log Kow ~ 0

Ingredient Bioaccumulation Data

Chemical name	Test method	Exposure time	Species	Bioconcentrat ion factor (BCF)	Results
Salt of N,N-Diethyl-p-Phenyl enediamine (1 - 5%) CAS#: -	None reported	None reported	None reported	None reported	Not determined

Mobility

Soil Organic Carbon-Water Partition Coefficient $\log\,K_{\text{oc}}\sim0$

Water solubility

EN / AGHS	Page 11 / 15



Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 12 / 15

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Other adverse effects

No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused products

Dispose of in accordance with local regulations. Dispose of waste in accordance with

environmental legislation.

Contaminated packaging Do not reuse empty containers.

14. TRANSPORT INFORMATION

U.S. DOT Not regulated TDG Not regulated Not regulated IATA IMDG Not regulated

No special precautions necessary. Note:

Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods.

If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories

TSCA Complies DSL/NDSL Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EINECS/ELINCS Complies **ENCS** Complies **IECSC** Complies Complies **KECL PICCS** Complies Complies TCSI **AICS** Complies NZIoC Complies

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

EN / AGHS Page 12/15

LA-UR-19-22215



Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 13 / 15

ENCS - Japan Existing and New Chemical Substances IECSC - China Inventory of Existing Chemical Substances KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substances Inventory AICS - Australian Inventory of Chemical Substances NZIoC - New Zealand Inventory of Chemicals

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

Acute health hazard	Yes
Chronic Health Hazard	No
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sodium phosphate dibasic 7558-79-4	5000 lb	Se.	-	Х

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

	Chemical name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
ſ	Sodium phosphate dibasic 7558-79-4	5000 lb	(-)	RQ 5000 lb final RQ RQ 2270 kg final RQ

US State Regulations

California Proposition 65

EN / AGHS

This product does not contain any Proposition 65 chemicals

New Jersey Trade Secret Registry Number 80100131-5001 (Carboxylate Salt) New Jersey Trade Secret Registry Number 80100131-5002 (DPD Salt) New York Trade Secret Registry Number 478 (DPD Salt) New York Trade Secret Registry Number 479 (Carboxylate Salt) This product complies with Pennsylvania Trade Secret Regulations. This product is registered as a trade secret in the state of Illinois. This product is registered as a trade secret in the state of Massachusetts. This product is registered as a trade secret in the state of New York.

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Sodium phosphate dibasic	X	X	X
227 27	20		~

LA-UR-19-22215 Attachment E

Page 13/15



Product Name DPD Free Chlorine Reagent

Revision Date 25-Apr-2018

Page 14/15

7558-79-4		

U.S. EPA Label Information

Chemical name	FIFRA	FDA
Sodium phosphate dibasic	180.0910	21 CFR 182.1778,21 CFR 182.6290,21
		CFR 182.6778,21 CFR 182.8778
Disodium EDTA	180.0940	-

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Special Comments

None

Additional information

Global Automotive Declarable Substance List (GADSL)

Not applicable

NFPA and HMIS Classifications

NFPA	Health hazards - 2	Flammability - 0	Instability - 0	Physical and Chemical Properties -
HMIS	Health hazards - 2	Flammability - 0	Physical Hazards - 0	Personal protection - X - See section 8 for more information

Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH Immediately Dangerous to Life or Health

ACGIH (American Conference of Governmental Industrial Hygienists)

NDF no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)

MAC Maximum Allowable Concentration Ceiling Ceiling Limit Value

X Listed Vacated These values have no official status. The only

binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state

regulations.

SKN*Skin designationSKN+Skin sensitizationRSP+Respiratory sensitization**Hazard DesignationCCarcinogenRReproductive toxicantMmutagen

maagen

Prepared By Hach Product Compliance Department

 Issue Date
 25-Apr-2018

 Revision Date
 25-Apr-2018

EN / AGHS Page 14/15



Product Name DPD Free Chlorine Reagent Revision Date 25-Apr-2018 Page 15 / 15

Revision Note

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

None

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY©2018

End of Safety Data Sheet

EN / AGHS Page 15/15



HACH 2076053





SAFETY DATA SHEET

Issue Date 25-Jul-2016 Revision Date 10-Aug-2016 Version 4 Page 1/20

1. IDENTIFICATION

Product identifier

Product Name Molybdovanadate Reagent

Other means of identification

Product Code(s)

2076053 6776102

Safety data sheet number M00297

UN/ID no UN3264

Component of Kits or Sets 001-H00462.88

Recommended use of the chemical and restrictions on use

Recommended Use Indicator for phosphate.

Uses advised against None Restrictions on use None

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company
P.O.Box 389 Loveland, CO 80539 USA (970) 669-3050

Emergency telephone number

(303) 623-5716 - 24 Hour Service (515)232-2533 - 8am - 4pm CST

Product Information

Chemical Name
Not applicable
Formula
Not applicable
CAS No
Not applicable
Not applicable
Not applicable
Not applicable
Not applicable
Not applicable
None reported

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Corrosive to metals	Category 1
Acute toxicity - Inhalation (Dusts/Mists)	Category 4
Skin corrosion/irritation	Category 1 Sub-category A
Serious eye damage/eye irritation	Category 1
Specific target organ toxicity (single exposure)	Category 2
Specific target organ toxicity (repeated exposure)	Category 1



Product Name Molybdovanadate Reagent Revision Date 10-Aug-2016 Page 2720

Hazards not otherwise classified (HNOC)

Data insufficient for GHS classification but significant enough for mention suggests:

CANCER HAZARD. STRONG INORGANIC ACID MISTS CONTAINING SULFURIC ACID CAN CAUSE CANCER.

Inhalation of low concentrations of sulfuric acid may result in airway irritation such as cough and shortness of breath; high concentrations may result in acute effects such as cough.

Label elements

Signal word - Danger



Hazard statements

H290 - May be corrosive to metals

H332 - Harmful if inhaled

H314 - Causes severe skin burns and eye damage

H371 - May cause damage to organs

H372 - Causes damage to organs through prolonged or repeated exposure

Precautionary statements

P234 - Keep only in original container

P260 - Do not breathe dust/fume/gas/mist/vapors/spray

P264 - Wash face, hands and any exposed skin thoroughly after handling

P270 - Do not eat, drink or smoke when using this product

P271 - Use only outdoors or in a well-ventilated area

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P310 - Immediately call a POISON CENTER or doctor/physician

P312 - Call a POISON CENTER or doctor/physician if you feel unwell

P363 - Wash contaminated clothing before reuse

P390 - Absorb spillage to prevent material damage

P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting

P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower

P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to

do. Continue rinsing

P405 - Store locked up

P406 - Store in corrosive resistant stainless steel container with a resistant inliner

P501 - Dispose of contents/ container to an approved waste disposal plant

Other Information

Harmful to aquatic life

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable

<u>Mixture</u>

Chemical Family Mixture.



Product Name Molybdovanadate Reagent Revision Date 10-Aug-2016

Page 3/20

Percent ranges are used where confidential product information is applicable.

Chemical Name	CAS No	Percent Range	HMRIC#
Sulfuric acid	7664-93-9	30 - 50	-
Molybdate (Mo7O246-), hexaammonium	12027-67-7	1 - 5	=
Molybdate (MoO42-), dihydrogen, (T-4)-	7782-91-4	1 - 5	-
Ammonium vanadate	7803-55-6	0.1 - 1	-

4. FIRST AID MEASURES

Description of first aid measures

General advice See section 8 for PPE that may be required during handling. Do not breathe

dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible). If no local exhaust use approved fume hood and/or respirator. If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician. Remove from exposure, lie down, Immediate medical attention is required. IF IN EYES: Flush eyes

for at least 15 minutes. IF ON SKIN (or hair): Remove/Take off immediately all

contaminated clothing. Rinse skin with water/shower.

Eye contact In the case of contact with eyes, rinse immediately with plenty of water and seek medical

advice. Remove contact lenses, if present and easy to do. Continue rinsing. Immediate

medical attention is required.

Skin contact IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin

with water/shower. Immediately flush skin with plenty of water for at least 15 (30 or 60) minutes. Immediate medical attention is required. Call a physician immediately. Removal of solidified molten material from skin requires medical assistance. In case of contact with Hydrogen fluoride, anhydrous (UN1052), flush skin and eyes with water for 5 minutes; then, for skin exposures rub on a calcium/jelly combination; for eyes flush with a water/calcium solution for 15 minutes. Remove and isolate contaminated clothing and shoes. Wash

contaminated clothing before reuse.

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for Inhalation

breathing. Call a POISON CENTER or doctor if you feel unwell.

IF SWALLOWED: Rinse Mouth. Do NOT induce vomiting. Call a physician immediately. Ingestion

Self-protection of the first aider First aider: Pay attention to self-protection. Use personal protective equipment as required.

Avoid contact with skin, eyes or clothing. Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way

valve or other proper respiratory medical device.

Most important symptoms and effects, both acute and delayed

See Section 11: TOXICOLOGICAL INFORMATION. Symptoms 5 4 1

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

LA-UR-19-22215 Attachment E



Product Name Molybdovanadate Reagent

Revision Date 10-Aug-2016

Page 4/20

Dry chemical.

Unsuitable extinguishing media Do NOT use water.

Flammable properties

During a fire, irritating and highly toxic gases may be generated by thermal decomposition. Contact with metals may evolve flammable hydrogen gas.

Specific hazards arising from the chemical

The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating and toxic gases and vapors. In the event of fire and/or explosion do not breathe fumes.

Hazardous combustion products

Ammonia. nitrogen oxides. Sulfur oxides.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

323			Access to the second			
2	ACCIDE	NITAL	DEI	EVEE	MEVE	IDEC
	ACCIDE					UNES

U.S. Notice Only persons properly qualified to respond to an emergency involving hazardous

substances may respond to a spill according to federal regulations (OSHA 29 CFR

1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Outside of the US, only persons properly qualified according to state or local regulations

should respond to a spill involving chemicals.

EC Notice Only persons properly qualified to respond to an emergency involving hazardous

substances should respond to a spill involving chemicals. See Section 13, Special

Instructions for disposal assistance.

WHMIS Notice Only persons properly qualified to respond to an emergency involving hazardous

substances should respond to a spill involving chemicals. See Section 13, Special

Instructions for disposal assistance.

Personal precautions, protective equipment and emergency procedures

Personal precautions Evacuate personnel to safe areas. Remove all sources of ignition. Do not touch or walk

through spilled material. Ventilate affected area. Use personal protective equipment as

required.

For emergency responders

Use personal protection recommended in Section 8.

Environmental precautions

Environmental precautions Avoid release to the environment. See Section 12 for additional ecological information.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so. Dike far ahead of liquid spill for later

disposal.

Methods for cleaning up

Take necessary precautions in observance of pertinent physical hazards. Neutralize spill if

necessary. Soak up with inert absorbent material. Take up mechanically, placing in appropriate containers for disposal. Clean contaminated surface thoroughly. Dispose of in

accordance with local, state and federal regulations or laws.

Emergency Response Guide Number 154

7. HANDLING AND STORAGE

Precautions for safe handling



Product Name Molybdovanadate Reagent

Revision Date 10-Aug-2016

Page 5/20

Advice on safe handling

Use personal protective equipment as required. Avoid contact with skin, eyes or clothing.

Do not breathe dust/fume/gas/mist/vapors/spray.

Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Keep out of the reach of **Storage Conditions**

children. Keep in properly labeled containers. Keep/store only in original container.

Flammability class Not applicable

Incompatible materials Oxidizers. Metals. Strong acids. Strong bases. Incompatible with strong acids and bases.

Incompatible with oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Sulfuric acid 30 - 50	TWA: 0.2 mg/m ³	TWA: 1 mg/m³ (vacated) TWA: 1 mg/m³	IDLH: 15 mg/m³ TWA: 1 mg/m³
Molybdate (Mo7O246-), hexaammonium 1 - 5	TWA: 0.5 mg/m ³	TWA: 5 mg/m³ (vacated) TWA: 5 mg/m³	IDLH: 1000 mg/m³ Mo
Molybdate (MoO42-), dihydrogen, (T-4)- 1 - 5	TWA: 0.5 mg/m ³	TWA: 5 mg/m³ (vacated) TWA: 5 mg/m³	IDLH: 1000 mg/m³ Mo
Ammonium vanadate 0.1 - 1	NDF	NDF	Ceiling: 0.05 mg/m ³ V dust and fume 15 min

Chemical Name	Alberta OEL	British Columbia OEL	Manitoba OEL	New Brunswick OEL	New Foundland & Labrador OEL
Sulfuric acid 30 - 50	TWA: 1 mg/m³ STEL: 3 mg/m³	TWA: 0.2 mg/m ³	TWA: 0.2 mg/m ³	TWA: 1 mg/m³ STEL: 3 mg/m³	TWA: 0.2 mg/m ³
Molybdate (Mo7O246-), hexaammonium 1 - 5	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 5 mg/m ³	TWA: 0.5 mg/m ³
Molybdate (MoO42-), dihydrogen, (T-4)- 1 - 5	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 5 mg/m ³	TWA: 0.5 mg/m ³

Chemical Name	Northwest Territories OEL	Nova Scotia OEL	Nunavut OEL	Ontario TWA	Prince Edward Island OEL
Sulfuric acid 30 - 50	TWA: 0.2 mg/m ³ STEL: 0.6 mg/m ³	TWA: 0.2 mg/m ³	TWA: 0.2 mg/m ³ STEL: 0.6 mg/m ³	TWA: 0.2 mg/m ³	TWA: 0.2 mg/m ³
Molybdate (Mo7O246-), hexaammonium 1 - 5	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m³ STEL: 1.5 mg/m³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m³
Molybdate (MoO42-), dihydrogen, (T-4)- 1 - 5	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m³ STEL: 1.5 mg/m³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³

Chemical Name	Quebec OEL	Saskatchewan OEL	Yukon OEL
Sulfuric acid	TWA: 1 mg/m ³	TWA: 0.2 mg/m ³	STEL: 1 mg/m ³
30 - 50	STEL: 3 mg/m ³	STEL: 0.6 mg/m ³	TWA: 1 mg/m ³
Molybdate (Mo7O246-),	TWA: 5 mg/m ³	TWA: 0.5 mg/m ³	STEL: 10 mg/m ³
hexaammonium		STEL: 1.5 mg/m ³	TWA: 5 mg/m ³
1 - 5			

LA-UR-19-22215



Product Name Molybdovanadate Reagent

Revision Date 10-Aug-2016

Page 6/20

Molybdate (MoO42-), dihydrogen,	TWA: 5 mg/m ³	TWA: 0.5 mg/m ³	STEL: 10 mg/m ³
(T-4)- 1 - 5		STEL: 1.5 mg/m ³	TWA: 5 mg/m³

Other Information Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962

(11th Cir., 1992).

Legend See section 16 for terms and abbreviations

Appropriate engineering controls

If no local exhaust use approved fume hood or self-contained breathing apparatus **Engineering Controls**

If no local exhaust use approved fume hood and/or respirator

Showers

Eyewash stations

Individual protection measures, such as personal protective equipment

Eyelface protection Avoid contact with eyes. Wear tight sealing safety goggles and/or face protection shield.

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, Skin and body protection

as appropriate, to prevent skin contact.

Respiratory protection Do not breathe gas/fumes/vapor/spray. If no local exhaust use approved fume hood and/or

respirator. In case of inadequate ventilation wear respiratory protection.

General Hygiene Considerations Avoid breathing (dust, vapor, mist, gas). Avoid contact with skin, eyes or clothing. Use

personal protective equipment as required. Wear suitable gloves and eyelface protection. Wash face, hands and any exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product. Keep away from food, drink and animal feeding stuffs. Regular cleaning of equipment, work area and clothing is recommended. Handle in accordance with good industrial hygiene and safety practice. Avoid prolonged or repeated

contact with skin. Take off all contaminated clothing and wash it before reuse.

Environmental exposure controls

Do not allow into any sewer, on the ground or into any body of water. Local authorities should be advised if significant spillages cannot be contained.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state Liquid

Gas Under Pressure Not classified according to GHS criteria

Appearance aqueous solution Color yellow

Odor None Odor threshold No data available

Property Values Remarks • Method

Molecular weight No data available

< 0.5 pН

~ -33 °C / -27 °F Melting point/freezing point Estimation based on theoretical

calculation

LA-UR-19-22215



Product Code(s) 2076053 Product Name Molybdovanadate Reagent

Issue Date 25-Jul-2016 Revision Date 10-Aug-2016

Version 4 Page 7/20

Boiling point / boiling range ~ 109 °C / 228 °F Estimation based on theoretical

calculation

Evaporation rate 0.06 (water = 1)

Vapor pressure 21.827 mm Hg / 2.91 kPa at 25 °C / 77 °F Estimation based on theoretical

calculation

Vapor density (air = 1) 0.62 (air = 1)

Specific gravity (water = 1 / air = 1) 1.375

Partition Coefficient (n-octanol/water)

Not applicable

Soil Organic Carbon-Water Partition

Not applicable

Coefficient

Autoignition temperature

Decomposition temperature

No data available

Solubility(ies)

Water solubility

Water solubility classification	Water solubility_	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Solubility in other solvents

Chemical Name	Solubility classification	Solubility	Solubility Temperature
Acid	Soluble	> 1000 mg/L	25 °C / 77 °F

Other Information

Metal Corrosivity Classified as corrosive to metal according to GHS criteria

GHS Metal Corrosivity Classification Category 1, H290

Steel Corrosion Rate 286.33 mm/yr / 11.27 in/yr

Aluminum Corrosion Rate

Bulk density Not applicable

Explosive propertiesNot classified according to GHS criteria.

Explosion data During a fire, corrosive and toxic gases may be generated by

thermal decomposition. Not Flammable, but reacts with most

metals to form flammable hydrogen gas.

 Upper explosion limit
 No data available

 Lower explosion limit
 No data available

Flammable properties During a fire, irritating and highly toxic gases may be generated

by thermal decomposition. Contact with metals may evolve



Product Code(s) 2076053 Product Name Molybdovanadate Reagent

Revision Date 10-Aug-2016 Issue Date 25-Jul-2016

Version 4 Page 8/20

flammable hydrogen gas.

Flammability Limit in Air

No data available Upper flammability limit: Lower flammability limit: No data available Flash point No data available

Oxidizing properties Not classified according to GHS criteria.

Reactivity propeties Not classified as self-reactive, pyrophoric, self-heating or emitting

flammable gases in contact with water according to GHS criteria.

10. STABILITY AND REACTIVITY

Reactivity propeties

Not classified as self-reactive, pyrophoric, self-heating or emitting flammable gases in contact with water according to GHS criteria

Chemical stability

Stable under recommended storage conditions.

Special dangers of the product

No information available

Possibility of Hazardous Reactions

No information available.

Hazardous polymerization Hazardous polymerization does not occur.

Conditions to avoid

Extreme temperatures. Heating to decomposition. Exposure to air or moisture over prolonged periods. Poor Ventilation.

Incompatible materials

Oxidizers. Metals. Strong acids. Strong bases. Incompatible with strong acids and bases. Incompatible with oxidizing agents.

Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

Explosive properties

Not classified according to GHS criteria. During a fire, corrosive and toxic gases may be generated by thermal decomposition. Not Flammable, but reacts with most metals to form flammable hydrogen gas.

No data available Upper explosion limit Lower explosion limit No data available

Autoignition temperature

No data available

Sensitivity to Static Discharge

None reported

LA-UR-19-22215 Attachment E



Product Name Molybdovanadate Reagent **Revision Date** 10-Aug-2016

Page 9/20

Sensitivity to Mechanical Impact

None reported

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information	Corrosive to skin. Corrosive to eyes. Harmful by inhalation.	
Inhalation	Causes burns. Corrosive by inhalation. Avoid breathing dust/fume/gas/mist/vapors/spray. Harmful by inhalation.	
Eye contact	Corrosive to the eyes and may cause severe damage including blindness.	
Skin contact	Cause severe skin burns and eye damage.	
Ingestion	Ingestion causes burns of the upper digestive and respiratory tracts.	
Aggravated Medical Conditions	Eye disorders. Skin disorders. Respiratory disorders.	
Toxicologically synergistic products	None known.	
Toxicokinetics, metabolism and distribution	See ingredients information below.	

Chemical Name	Toxicokinetics, metabolism and distribution
Sulfuric acid	The corrosivity of sulfuric acid makes it difficult to asses it's effects on metabolism. Its corrosivity is also the
(30 - 50)	main contributor to acute deaths, therefore it is not classified for acute toxicity.
CAS#: 7664-93-9	

Product Acute Toxicity Data

Oral Exposure Route

Dermal Exposure Route

No data available

Inhalation (Dust/Mist) Exposure Route

No data available

Inhalation (Vapor) Exposure Route

No data available

Inhalation (Gas) Exposure Route

No data available

The following values are calculated based on chapter 3.1 of the GHS document $\,$

ATEmix (oral)	9,359.00 mg/kg
ATEmix (inhalation-dust/mist)	3.55 mg/L

Ingredient Acute Toxicity Data

Oral Exposure Route

Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Molybdate (Mo7O246-), hexaammonium (1 - 5) CAS#: 12027-67-7	Rat LD50	333 mg/kg	None reported	None reported	Vendor SDS
Molybdate (MoO42-), dihydrogen, (T-4)- (1 - 5) CAS#: 7782-91-4	Rat LD50	2689 mg/kg	None reported	None reported	Vendor SDS
Ammonium vanadate (0.1 - 1) CAS#: 7803-55-6	Rat LD50	58.1 mg/kg	None reported	None reported	ChemADVISOR
Chemical Name	Endpoint	Reported	Exposure	Toxicological effects	Key literature references and



Product Name Molybdovanadate Reagent

Revision Date 10-Aug-2016

Page 10 / 20

	type	dose	time		sources for data
Sulfuric acid (30 - 50) CAS#: 7664-93-9	Rat LD50	2140 mg/kg	None reported	None reported	IUCLID (The International Uniform Chemical Information Database)
Molybdate (Mo7O246-), hexaammonium (1 - 5) CAS#: 12027-67-7	Rat LD50	354 mg/kg	None reported	None reported	Vendor SDS

Dermal Exposure Route

Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Molybdate (MoO42-), dihydrogen, (T-4)- (1 - 5) CAS#: 7782-91-4	Rat LD50	> 2000 mg/kg	None reported	None reported	IUCLID (The International Uniform Chemical Information Database)
Ammonium vanadate (0.1 - 1) CAS#: 7803-55-6	Rat LD50	2102 mg/kg	None reported	None reported	ChemADVISOR

Inhalation (Dust/Mist) Exposure Route

Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Ammonium vanadate (0.1 - 1)	Rat LC50	0.0078 mg/L	4 hours	None reported	ChemADVISOR
CAS#: 7803-55-6					

Inhalation (Vapor) Exposure Route

Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (30 - 50) CAS#: 7664-93-9	Rat LC50	0.510 mg/L	None reported	None reported	LOLI
Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (30 - 50)	Human TD∟∘	0.144 mg/L	4 hours	Lungs, Thorax, or Respiration Dyspnea	RTECS (Registry of Toxic Effects of Chemical

Inhalation (Gas) Exposure Route

No data available

Product Skin Corrosion/Irritation Data

No data available.

Ingredient Skin Corrosion/Irritation Data

Chemical Name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sulfuric acid (30 - 50) CAS#: 7664-93-9	Existing human experience	Human	None reported	None reported	Corrosive to skin	HSDB (Hazardous Substances Data Bank)

Product Serious Eye Damage/Eye Irritation Data

No data available.

Ingredient Eye Damage/Eye Irritation Data



Product Name Molybdovanadate Reagent

Revision Date 10-Aug-2016

Page 11 / 20

Chemical Name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sulfuric acid (30 - 50) CAS#: 7664-93-9	Existing human experience	Human	None reported	None reported	Corrosive to eyes	HSDB (Hazardous Substances Data Bank)

Sensitization Information

Product Sensitization Data

Skin Sensitization Exposure Route

No data available.

Respiratory Sensitization Exposure Route

No data available.

Ingredient Sensitization Data

Skin Sensitization Exposure Route

No data available.

Respiratory Sensitization Exposure Route

No data available.

Chronic Toxicity Information

Product Repeat Dose Toxicity Data

Oral Exposure Route

Dermal Exposure Route

No data available.

Inhalation (Dust/Mist) Exposure Route

No data available.

Inhalation (Vapor) Exposure Route

No data available.

Inhalation (Gas) Exposure Route

No data available.

Ingredient Repeat Dose Toxicity Data

 Oral Exposure Route
 No data available

 Dermal Exposure Route
 No data available

 Inhalation (Dust/Mist) Exposure Route
 No data available

Inhalation (Vapor) Exposure Route

initiation (Tape) Expedit treate								
Chemical Name	Endpoint	Reported Exposure Toxicological effects		Key literature references and				
	type	dose	time	****	sources for data			
Sulfuric acid	Human	.003 mg/L	168 days	Musculoskeletal	RTECS (Registry of Toxic			
(30 - 50)	TC∟o			Changes in teeth and	Effects of Chemical			
CAS#: 7664-93-9				supporting structures	Substances)			

Inhalation (Gas) Exposure Route No data available

Chemical Name	CAS No	ACGIH	IARC	NTP	OSHA
Sulfuric acid	7664-93-9	A2	1	Х	Х
Molybdate (Mo7O246-), hexaammonium	12027-67-7	A3	News	5	s = .
Molybdate (MoO42-), dihydrogen, (T-4)-	7782-91-4	A3	¥	=	=



Product Name Molybdovanadate Reagent

Revision Date 10-Aug-2016

Page 12 / 20

1	Ammonium vanadate	7803-55-6	<u>=</u>	~	2	92

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	A2 - Suspected Human Carcinogen A3 - Animal Carcinogen
IARC (International Agency for Research on Cancer)	Group 1 - Carcinogenic to Humans
NTP (National Toxicology Program)	Known - Known Carcinogen
OSHA (Occupational Safety and Health Administration of the US Department of Labor)	X - Present

Product Carcinogenicity Data

No data available

Oral Exposure Route

No data available

Dermal Exposure Route

No data available

Inhalation (Dust/Mist) Exposure Route

No data available

Inhalation (Vapor) Exposure Route

No data available

Inhalation (Gas) Exposure Route

No data available

Inhalation (Gas) Exposure Route

Oral Exposure Route

Dermal Exposure Route

No data available
Inhalation (Dust/Mist) Exposure Route

No data available
Inhalation (Vapor) Exposure Route

No data available
Inhalation (Gas) Exposure Route

No data available

Product Germ Cell Mutagenicity invitro Data

No data available.

Ingredient Germ Cell Mutagenicity invitro Data

Toxicological data for ingredients is not indicative of likely harm.

Chemical Name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Sulfuric acid (30 - 50) CAS#: 7664-93-9	Cytogenetic analysis	Hamster ovary	4 mmol/L	None reported	Positive test result for mutagenicity	No information available
Ammonium vanadate (0.1 - 1) CAS#: 7803-55-6	DNA damage	Human lymphocyte	0.2 mmol/L	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical Name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Ammonium vanadate (0.1 - 1) CAS#: 7803-55-6	Mutation in mammalian somatic cells	Hamster lung	0.005 mmol/L	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)

Oral Exposure Route

No data available



Product Code(s) 2076053 Product Name Molybdovanadate Reagent

Issue Date 25-Jul-2016 Revision Date 10-Aug-2016

Version 4 Page 13/20

 Dermal Exposure Route
 No data available

 Inhalation (Dust/Mist) Exposure Route
 No data available

 Inhalation (Vapor) Exposure Route
 No data available

 Inhalation (Gas) Exposure Route
 No data available

Ingredient Germ Cell Mutagenicity invivo Data

No data available Oral Exposure Route **Dermal Exposure Route** No data available Inhalation (Dust/Mist) Exposure Route No data available Inhalation (Vapor) Exposure Route No data available Inhalation (Gas) Exposure Route No data available **Oral Exposure Route** No data available No data available **Dermal Exposure Route** Inhalation (Dust/Mist) Exposure Route No data available Inhalation (Vapor) Exposure Route No data available Inhalation (Gas) Exposure Route No data available

Ingredient Reproductive Toxicity Data

 Oral Exposure Route
 No data available

 Dermal Exposure Route
 No data available

 Inhalation (Dust/Mist) Exposure Route
 No data available

Inhalation (Vapor) Exposure Route

Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (30 - 50)	Rabbit TC∟₀	.02 mg/L	7 hours	Specific Developmental Abnormalities	No information available
CAS#: 7664-93-9				Musculoskeletal system	

Inhalation (Gas) Exposure Route No data available

12. ECOLOGICAL INFORMATION

Ecotoxicity Harmful to aquatic life.

Product Ecological Data

Aquatic toxicity

Fish No data available

Crustacea No data available

Algae No data available

Terrestrial toxicity



Product Name Molybdovanadate Reagent

Revision Date 10-Aug-2016

Page 14/20

Soil No data available Vertebrates No data available Invertebrates No data available

Ingredient Ecological Data

Aquatic toxicity

Fish

Chemical Name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Molybdate (Mo7O246-), hexaammonium (1 - 5) CAS#: 12027-67-7	96 hours	Oncorhynchus mykiss	LC50	320 mg/L	Vendor SDS
Ammonium vanadate (0.1 - 1) CAS#: 7803-55-6	96 hours	None reported	LC50	2.6 mg/L	EPA (United States Environmental Protection Agency)
Chemical Name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Sulfuric acid (30 - 50) CAS#: 7664-93-9	96 hours	Lepomis macrochirus	LC50	> 16 mg/L	IUCLID (The International Uniform Chemical Information Database)
Ammonium vanadate (0.1 - 1) CAS#: 7803-55-6	144 hours	Poecilia reticulata	LC50	1.5 mg/L	EPA (United States Environmental Protection Agency)

Crustacea

Chemical Name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Molybdate (Mo7O246-), hexaammonium (1 - 5) CAS#: 12027-67-7	48 Hours	Daphnia magna	EC ₅₀	140 mg/L	Vendor SDS
Chemical Name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Sulfuric acid (30 - 50) CAS#: 7664-93-9	48 hours	Crangon crangon	EC50	> 70 mg/L	IUCLID (The International Uniform Chemical Information Database)

<u>Algae</u>

Chemical Name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Molybdate (Mo7O246-), hexaammonium (1 - 5) CAS#: 12027-67-7	72 Hours	Desmodesmus subspicatus	EC50	41 mg/L	Vendor SDS

Terrestrial toxicity

No data available Soil Vertebrates No data available

LA-UR-19-22215 Attachment E



Product Code(s) 2076053 Issue Date 25-Jul-2016

Version 4

Product Name Molybdovanadate Reagent

Revision Date 10-Aug-2016

Page 15 / 20

Invertebrates No data available

Other Information

Canadian Environmental Protec Environmentally Hazardous Sub	tion Act (CEPA) - Domestic Subst estances Categorizations	ances List (DSL):		
Chemical Name	Category	Persistent	Bioaccumulation	Inherently Toxic to Aquatic Organisms
Molybdate (Mo7O246-), hexaammonium (1 - 5) CAS#: 12027-67-7	Inorganics	Yes	No	Yes
Ammonium vanadate (0.1 - 1) CAS#: 7803-55-6	Inorganics	Yes	No	Yes

Persistence and degradability

None known.

Product Biodegradability Data

If available, see ingredient data below.

Ingredient Biodegradability Data

Test data reported below

Chemical Name	Test method	Biodegradation	Exposure time	Results
Molybdate (Mo7O246-), hexaammonium (1 - 5) CAS#: 12027-67-7	None reported	None reported	None reported	Readily biodegradable

Bioaccumulation

If available, see ingredient data below.

Product Bioaccumulation Data Test data reported below.

Ingredient Bioaccumulation Data No data available

Additional information

Product Information

Not applicable Partition Coefficient (n-octanol/water)

Ingredient Information

Chemical Name	Partition Coefficient (n-octanol/water)	Method
Molybdate (MoO42-), dihydrogen, (T-4)-	log Kow = 1.93	Estimation through KOWMN v1.68 part
(1 - 5)		of the Estimation Programs Interface
CAS#: 7782-91-4		(EPI) Suite™

Mobility

Mobility in soil: High mobility. If available, see ingredient data below.

LA-UR-19-22215



Product Code(s) 2076053 Issue Date 25-Jul-2016

Product Name Molybdovanadate Reagent Revision Date 10-Aug-2016

Page 16 / 20

Product Information

Version 4

Soil Organic Carbon-Water Partition Coefficient Not applicable Ingredient Information No data available

Additional information

Water solubility

Product Information

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Ingredient Information

Chemical Name	Water solubility classification	Water solubility	Water solubility temperature °C	Water solubility temperature °F
Sulfuric acid (30 - 50) CAS#: 7664-93-9	Soluble	> 1000 mg/L	25 °C	77 °F
Molybdate (Mo7O246-), hexaammonium (1 - 5) CAS#: 12027-67-7	Soluble	> 1000 mg/L	25 °C	77 °F
Molybdate (MoO42-), dihydrogen, (T-4)- (1 - 5) CAS#: 7782-91-4	Slightly soluble	> 0.1 mg/L	25 °C	77 °F
Ammonium vanadate (0.1 - 1) CAS#: 7803-55-6	Moderately soluble	520 mg/L	15 °C	59 °F

Other adverse effects

No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal of wastes Disposal should be in accordance with applicable regional, national and local laws and

regulations.

Contaminated packaging Do not reuse container

D002, P119 **US EPA Waste Number**

Chemical Name	RCRA	RCRA - Basis for Listing	RCRA - D Series Wastes	RCRA - U Series Wastes
Ammonium vanadate 7803-55-6	P119	= "	-	-

Chemical Name	RCRA - Halogenated Organic Compounds	RCRA - P Series Wastes	RCRA - F Series Wastes	RCRA - K Series Wastes
Ammonium vanadate 7803-55-6	<u>-</u>	P119	1	1

Special instructions for disposal Dispose of in accordance with federal, state and local regulations.



Product Name Molybdovanadate Reagent

Revision Date 10-Aug-2016

Page 17 / 20

14. TRANSPORT INFORMATION

DOT

UN/ID no UN3264

Proper shipping name Corrosive Liquid, Acidic, Inorganic, N.O.S.

(<45% Sulfuric Acid solution) **DOT Technical Name**

Hazard Class 8 **Packing Group** П **Emergency Response Guide** 154

Number

TDG

UN/ID no UN3264

Proper shipping name Corrosive Liquid, Acidic, Inorganic, N.O.S.

TDG Technical Name (<45% Sulfuric Acid solution)

Hazard Class Packing Group 11

IATA

UN/ID no UN3264

Proper shipping name Corrosive Liquid, Acidic, Inorganic, N.O.S.

(<45% Sulfuric Acid solution) IATA Technical Name

Hazard Class Packing Group II **ERG Code** 154

IMDG

UN/ID no UN3264

IMDG Technical Name (<45% Sulfuric Acid solution)

Hazard Class Packing Group П

Note: No special precautions necessary.

Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods.

If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories

TSCA Complies DSL/NDSL Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EINECS/ELINCS Complies **ENCS** Complies Complies **IECSC KECL** Complies **PICCS** Complies **TCSI** Complies AICS Complies NZIoC Complies

LA-UR-19-22215 Attachment E E-62 of 208



Product Name Molybdovanadate Reagent

Revision Date 10-Aug-2016

Page 18 / 20

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substances Inventory

AICS - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	SARA 313 - Threshold Values %
Sulfuric acid (CAS #: 7664-93-9)	1.0
Ammonium vanadate (CAS #: 7803-55-6)	1.0

SARA 311/312 Hazard Categories

Acute health hazard	Yes
Chronic Health Hazard	Yes
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sulfuric acid 7664-93-9	1000 lb		¥	Х

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Sulfuric acid	1000 lb	1000 lb	RQ 1000 lb final RQ
7664-93-9		The Colonial Individual	RQ 454 kg final RQ
Ammonium vanadate	1000 lb	*	RQ 1000 lb final RQ
7803-55-6			RQ 454 kg final RQ

U.S. - DEA (Drug Enforcement Administration) List I & List II

Chemical Name		U.S DEA (Drug Enforcement Administration) - List II or Essential
	Chemicals	Chemicals
Sulfuric acid	Not Listed	50 gallon Export Volume (Exports,
(30 - 50)	and a process of the second of	transshipments and international
CAS#: 7664-93-9		transactions to designated countries)

US State Regulations

California Proposition 65

This product contains the following Proposition 65 chemicals

LA-UR-19-22215 Attachment E



Product Name Molybdovanadate Reagent

Revision Date 10-Aug-2016

Page 19 / 20

Chemical Name	California Proposition 65
Sulfuric acid (CAS #: 7664-93-9)	Carcinogen

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Sulfuric acid 7664-93-9	Х	Х	Х
Ammonium vanadate 7803-55-6	Χ	Х	X

U.S. EPA Label Information

EPA Pesticide Registration Number Not applicable

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

NFPA and HMIS Classifications

NFPA	Health hazards - 0	Flammability - 0	Instability - 0	Physical and Chemical Properties -
HMIS	Health hazards - 0	Flammability - 0	Physical hazards - 0	Personal protection - X - See section 8 for more information

Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH Immediately Dangerous to Life or Health

ACGIH (American Conference of Governmental Industrial Hygienists)

NDF no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)

MAC Maximum Allowable Concentration Ceiling Ceiling Limit Value

X Listed Vacated These values have no official status. The only

binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state

regulations.

SKN* Skin designation SKN+ Skin sensitization
RSP+ Respiratory sensitization ** Hazard Designation
C Carcinogen R Reproductive toxicant

M mutagen

Prepared By Hach Product Compliance Department

 Issue Date
 25-Jul-2016

 Revision Date
 10-Aug-2016

Revision Note None



Product Name Molybdovanadate Reagent Revision Date 10-Aug-2016 Page 20 / 20

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY ©2015

End of Safety Data Sheet



HACH 2105669





SAFETY DATA SHEET

Issue Date 30-04-2018 Revision Date Version 5.4 Page 1/17

04-May-2018

1. IDENTIFICATION

Product identifier

Product Name DPD Total Chlorine Reagent

Other means of identification

 Product Code(s)
 2105669

 Safety data sheet number
 M00110

HMRIC# HMIRA Registry Number 9936 Filed 2016-04-11

Recommended use of the chemical and restrictions on use

Recommended Use Laboratory reagent. Indicator for total chlorine.

Uses advised against None.
Restrictions on use None.

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

Emergency telephone number

+1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Signal word - Warning



EN / AGHS Page 1/17



Product Name DPD Total Chlorine Reagent Revision Date 04-May-2018 Page 2 / 17

Hazard statements

H315 - Causes skin irritation

H319 - Causes serious eye irritation

Precautionary statements

P302 + P352 - IF ON SKIN: Wash with plenty of soap and water

P332 + P313 - If skin irritation occurs: Get medical advice/attention

P362 - Take off contaminated clothing and wash before reuse

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P337 + P313 - If eye irritation persists: Get medical advice/attention

Other Hazards Known

May be harmful if swallowed

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable

Mixture

Chemical Family

Mixture.

Percent ranges are used where confidential product information is applicable.

Chemical name	CAS No.	Percent Range	HMRIC#
Sodium phosphate dibasic	7558-79-4	20 - 30%	
Potassium iodide (KI)	7681-11-0	20 - 30%	5
Salt of N,N-Diethyl-p-Phenylenediamine	31	1 - 5%	=
Glycine, N,N-1,2-ethanediylbis[N-(carboxymethyl)-, disodium salt, dihydrate	6381-92-6	<1%	e e

EN / AGHS Page 2/17



Product Name DPD Total Chlorine Reagent

Revision Date 04-May-2018

Page 3/17

4. FIRST AID MEASURES

Description of first aid measures

General advice Show this safety data sheet to the doctor in attendance.

Inhalation Remove to fresh air. Get medical attention immediately if symptoms occur.

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep

eye wide open while rinsing. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists. Do not rub affected area.

Skin contact Wash off immediately with soap and plenty of water for at least 15 minutes. Get medical

attention if irritation develops and persists.

Ingestion Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth

to an unconscious person. Do NOT induce vomiting. Call a physician.

Self-protection of the first aider Avoid contact with skin, eyes or clothing.

Most important symptoms and effects, both acute and delayed

Symptoms Burning sensation.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media Use extinguishing measures that are appropriate to local circumstances and the

surrounding environment.

Unsuitable Extinguishing Media Caution: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the

chemical

No information available.

Hazardous combustion products Carbon monoxide, Carbon dioxide. Iodine compounds. Phosphorus oxides. Potassium

oxides. Sodium monoxide. Nitrogen oxides.

Special protective equipment for

fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout

gear.

6. ACCIDENTAL RELEASE MEASURES

U.S. Notice Only persons properly qualified to respond to an emergency involving hazardous

substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and

guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations

should respond to a spill involving chemicals.

Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal

protective equipment as required.

Other Information Refer to protective measures listed in Sections 7 and 8.

EN / AGHS Page 3/17



Product Name DPD Total Chlorine Reagent

Revision Date 04-May-2018

Page 4/17

Environmental precautions

Environmental precautions Prevent further leakage or spillage if safe to do so.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so. Methods for cleaning up Pick up and transfer to properly labeled containers.

Clean contaminated objects and areas thoroughly observing environmental regulations. Prevention of secondary hazards

Reference to other sections See section 8 for more information. See section 13 for more information.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with

skin, eyes or clothing. Do not eat, drink or smoke when using this product. Take off

contaminated clothing and wash before reuse.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place.

Flammability class Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Potassium iodide (KI)	TWA: 0.01 ppm	NDF	NDF
CAS#: 7681-11-0			

Appropriate engineering controls

Engineering Controls

Showers

Eyewash stations Ventilation systems.

Individual protection measures, such as personal protective equipment

No protective equipment is needed under normal use conditions. If exposure limits are Respiratory protection

exceeded or irritation is experienced, ventilation and evacuation may be required.

Hand Protection Wear suitable gloves. Impervious gloves.

Eye/face protection If splashes are likely to occur, wear safety glasses with side-shields.

Wear suitable protective clothing. Long sleeved clothing. Skin and body protection

Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this **General Hygiene Considerations**

product. Avoid contact with skin, eyes or clothing.

EN / AGHS Page 4/17



Product Code(s) 2105669 Issue Date 30-04-2018

Version 5.4

Product Name DPD Total Chlorine Reagent

Revision Date 04-May-2018

Page 5/17

Environmental exposure controls Local authorities should be advised if significant spillages cannot be contained. Do not

allow into any sewer, on the ground or into any body of water.

Thermal hazards None under normal processing.

9. CHEMICAL PROPERTIES PHYSICAL AND

Information on basic physical and chemical properties

Physical state

Solid

Appearance powder Odorless Odor

Color White to light pink Odor threshold No data available

Property Values Remarks • Method

Molecular weight No data available pΗ No data available 145 °C / 293 °F Melting point/freezing point Boiling point / boiling range No data available **Evaporation rate** Not applicable Vapor pressure Not applicable Vapor density (air = 1) Not applicable

Specific gravity (water = 1 / air = 1) 1.79

Partition Coefficient (n-octanol/water) log Kow ~ 0 Soil Organic Carbon-Water Partition log Koc ~ 0

Coefficient

Autoignition temperature No data available Decomposition temperature No data available Dynamic viscosity Not applicable Kinematic viscosity Not applicable

Solubility(ies) Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Solubility in other solvents

Chemical Name	Solubility classification	Solubility	Solubility Temperature
None reported	No information available	No data available	No information available

Other Information

Metal Corrosivity

0.97 mm/yr / 0.04 in/yr 0.15 mm/yr / 0.01 in/yr Steel Corrosion Rate **Aluminum Corrosion Rate**

EN / AGHS Page 5/17



Product Name DPD Total Chlorine Reagent

Revision Date 04-May-2018

Page 6/17

Volatile Organic Compounds (VOC) Content

Not applicable

Chemical name	CAS No.	Volatile organic compounds (VOC) content	CAA (Clean Air Act)	
Sodium phosphate dibasic	7558-79-4	No data available		
Potassium iodide (KI)	7681-11-0	Not applicable		
Salt of N,N-Diethyl-p-Phenylenediamine	-	Not applicable	F	
Glycine, N,N-1,2-ethanediylbis[N-(carboxymeth yl)-, disodium salt, dihydrate	6381-92-6	Not applicable	-	

Explosive properties

Upper explosion limitNo data availableLower explosion limitNo data available

Flammable properties

Flash point Not applicable

Flammability Limit in Air

Upper flammability limit:
Lower flammability limit:
No data available

Particle Size No information available

Particle Size Distribution No information available

10. STABILITY AND REACTIVITY

Reactivity

Not applicable.

Chemical stability

Stability Stable under normal conditions.

Explosion data

Sensitivity to Mechanical Impact None Sensitivity to Static Discharge None.

Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing.

<u>Hazardous polymerization</u> None under normal processing.

Trone under normal processing

Conditions to avoid

Conditions to avoid None known based on information supplied.

Incompatible materials_

Incompatible materials Strong acids. Strong bases. Strong oxidizing agents.

EN / AGHS Page 6/17



Product Name DPD Total Chlorine Reagent **Revision Date** 04-May-2018

Page 7/17

Hazardous Decomposition Products

Carbon dioxide. Carbon monoxide. Iodine compounds. Phosphorus oxides. Potassium oxide. Nitrogen oxides.

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information

Inhalation May cause irritation of respiratory tract.

Eye contact Irritating to eyes. Causes serious eye irritation.

Skin contact Causes skin irritation.

Ingestion Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Symptoms Redness. May cause redness and tearing of the eyes.

Aggravated Medical Conditions Skin disorders. Eye disorders.

Toxicologically synergistic None known.

products

Toxicokinetics, metabolism and See ingredients information below.

distribution

Chemical name	Toxicokinetics, metabolism and distribution
Sodium phosphate	Phosphates are widely utilized by cells for metabolism of proteins, fats and carbohydrates.
dibasic	
(20 - 30%)	
CAS#: 7558-79-4	
	May cross placenta and be excreted in breast milk. May react synergistically with mercury.
(20 - 30%)	
CAS#: 7681-11-0	
	EDTA and related compounds are poorly absorbed by the digestive system.
N,N-1,2-ethanediylbis	
[N-(carboxymethyl)-,	
disodium salt,	
dihydrate	
(<1%)	
CAS#: 6381-92-6	

Product Acute Toxicity Data
Oral Exposure Route

Test data reported below

EN / AGHS Page 7/17



Product Name DPD Total Chlorine Reagent **Revision Date** 04-May-2018

Page 8/17

Endnaint tres	Reported dose	Toxicological	Key literature references and sources for data
Endpoint type Rat	4700 mg/kg	effects	Outside testing
LD ₅₀	4700 mg/kg	Behavioral	Outside testing
LD50		Flaccid muscle	
		tone	
		Lethargy	
		Prostration	
		Eye	
		Chromodacryorrhe	
		_ a	
		Ptosis	
		Gastrointestinal	
		Abnormalities of	
		the gastrointestinal	
		tract	
		Diarrhea	
		Liver	
		Abnormalities of	
		the liver	
		Lungs, Thorax,	
		or Respiration	
		Abnormalities of	
		the lungs	
		Dyspnea	
		Red or brown	
		staining of the	
		nose/mouth area	
		Nutritional and	
		Gross Metabolic	
		Soiling of the	
		anogenital area	
		Wetness of the	
		anogenital area	
		Reproductive	
		Skin and	
		Appendages	
		Piloerection	

Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route

No data available No data available No data available No data available

Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

Acute Toxicity Estimations (ATE)

ATEmix (oral)	No information available
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	No information available
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

Ingredient Acute Toxicity Data

Oral Exposure Route If available, see data below						
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data	
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Rat LD₅o	2779 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)	

EN / AGHS Page 8/17



Product Name DPD Total Chlorine Reagent

Revision Date 04-May-2018

Page 9/17

Salt of N,N-Diethyl-p-Phenyl enediamine (1 - 5%) CAS#: -	Rat LD50	695 mg/kg	None reported	None reported	Outside testing
Glycine, N,N-1,2-ethanediylbis [N-(carboxymethyl)-, disodium salt, dihydrate (<1%) CAS#: 6381-92-6	Rat LD50	2300 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sodium phosphate dibasic (20 - 30%) CAS#: 7558-79-4	Rat LD50	17000 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Mouse LD50	1000 mg/kg	None reported	None reported	Vendor SDS

Dermal Exposure Route If available, see data below Endpoint Reported Key literature references and Chemical name Exposure Toxicological effects type dose time sources for data Potassium iodide (KI) ECHA (The European 2000 mg/kg None None reported Rat (20 - 30%) LD₅₀ reported Chemicals Agency) CAS#: 7681-11-0

 Inhalation (Dust/Mist) Exposure Route
 If available, see data below

 Inhalation (Vapor) Exposure Route
 If available, see data below

 Inhalation (Gas) Exposure Route
 If available, see data below

Product Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route

 Dermal Exposure Route
 No data available

 Inhalation (Dust/Mist) Exposure Route
 No data available

 Inhalation (Vapor) Exposure Route
 No data available

 Inhalation (Gas) Exposure Route
 No data available

Ingredient Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Mouse LD∟∘	1862 mg/kg	None reported	Lungs, Thorax, or Respiration Dyspnea	RTECS (Registry of Toxic Effects of Chemical Substances)

 Dermal Exposure Route
 If available, see data below

 Inhalation (Dust/Mist) Exposure Route
 If available, see data below

 Inhalation (Vapor) Exposure Route
 If available, see data below

 Inhalation (Gas) Exposure Route
 If available, see data below

Aspiration toxicity
If available, see data below

Kinematic viscosity Not applicable

Product Skin Corrosion/Irritation Data

No data available.

Ingredient Skin Corrosion/Irritation Data

If available, see data below

Chemical name	Test method	Species	Reported	Exposure	Results	Key literature
EN / AGHS						Page 9/17



Product Name DPD Total Chlorine Reagent

Revision Date 04-May-2018

Page 10 / 17

			dose	time		references and sources for data
Sodium phosphate dibasic (20 - 30%) CAS#: 7558-79-4	Standard Draize Test	Rabbit	500 mg	24 hours	Skin irritant	RTECS (Registry of Toxic Effects of Chemical Substances)
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Standard Draize Test	Rabbit	None reported	None reported	Skin irritant	Vendor SDS
Glycine, N,N-1,2-ethanediylbis [N-(carboxymethyl)-, disodium salt, dihydrate (<1%) CAS#: 6381-92-6	Standard Draize Test	Rabbit	500 mg	20 hours	Not corrosive or irritating to skin	ECHA (The European Chemicals Agency)

Product Serious Eye Damage/Eye Irritation Data

No data available.

Ingredient Eye Damage/Eye Irritation Data

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sodium phosphate dibasic (20 - 30%) CAS#: 7558-79-4	Standard Draize Test	Rabbit	500 mg	24 hours	Eye irritant	RTECS (Registry of Toxic Effects of Chemical Substances)
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Standard Draize Test	Rabbit	None reported	24 hours	Eye irritant	Vendor SDS
Glycine, N,N-1,2-ethanediylbis [N-(carboxymethyl)-, disodium salt, dihydrate (<1%) CAS#: 6381-92-6	Standard Draize Test	Rabbit	50 mg	None reported	Mild eye irritant	ECHA (The European Chemicals Agency)

Sensitization Information

Product Sensitization Data

Skin Sensitization Exposure Route
Respiratory Sensitization Exposure Route

Ingredient Sensitization Data

Skin Sensitization Exposure Route If available, see data below.

Chemical name	Test method	Species	Results	Key literature references and sources for data
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Patch test	Human	Not confirmed to be a skin sensitizer	ERMA (New Zealands Environmental Risk Management Authority)

Respiratory Sensitization Exposure Route

If available, see data below.

No data available.

No data available.

Chronic Toxicity Information

Product Specific Target Organ Toxicity Repeat Dose Data

 Oral Exposure Route
 No data available.

 Dermal Exposure Route
 No data available.

EN / AGHS Page 10/17



Product Code(s) 2105669 Issue Date 30-04-2018

Version 5.4

Product Name DPD Total Chlorine Reagent

Revision Date 04-May-2018

Page 11 / 17

 Inhalation (Dust/Mist) Exposure Route
 No data available.

 Inhalation (Vapor) Exposure Route
 No data available.

 Inhalation (Gas) Exposure Route
 No data available.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

Oral Exposure Route | If available, see data below
Chemical name | Endpoint | Reported | Exposure | Toxicological effects

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Rat NOAEL	0.5 mg/kg	90 days	None reported	ECHA (The European Chemicals Agency)

Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
If available, see data below

Product Carcinogenicity Data

 Oral Exposure Route
 No data available

 Dermal Exposure Route
 No data available

 Inhalation (Dust/Mist) Exposure Route
 No data available

 Inhalation (Vapor) Exposure Route
 No data available

 Inhalation (Gas) Exposure Route
 No data available

Ingredient Carcinogenicity Data

Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
Sodium phosphate dibasic	7558-79-4		-		(=
Potassium iodide (KI)	7681-11-0			-	1=
Salt of N,N-Diethyl-p-Phenylenedi amine		E		=	
Glycine, N,N-1,2-ethanediylbis[N-(c arboxymethyl)-, disodium salt, dihydrate	6381-92-6	-	_	-	

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply
NTP (National Toxicology Program)	Does not apply
OSHA (Occupational Safety and Health Administration of the US Department of	Does not apply
Labor)	\$100 DT

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Germ Cell Mutagenicity invitro Data

No data available.

Ingredient Germ Cell Mutagenicity invitro Data

If available, see data below

Chemical name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Cytogenetic analysis	Rat ascites tumor	500 mg/kg	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical

EN / AGHS Page 11 / 17



Product Name DPD Total Chlorine Reagent

Revision Date 04-May-2018

Page 12 / 17

						Substances)
Glycine,	Cytogenetic	Hamster lung	200 mg/L	None	Positive test result for	RTECS (Registry
N,N-1,2-ethanediylbis	analysis	=	=	reported	mutagenicity	of Toxic Effects of
[N-(carboxymethyl)-,	Walter to the second			SUPERIOR TO EXPERIENCE GRACE		Chemical
disodium salt,						Substances)
dihydrate						And the state of t
(<1%)						
CAS#: 6381-92-6						

Product Germ Cell Mutagenicity invivo Data

Oral Exposure Route

Dermal Exposure Route

Inhalation (Dust/Mist) Exposure Route

Inhalation (Vapor) Exposure Route

Inhalation (Gas) Exposure Route

No data available

No data available

No data available

No data available

Ingredient Germ Cell Mutagenicity invivo Data

Oral Exposure Route
Dermal Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below

Product Reproductive Toxicity Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
No data available
No data available
No data available

Ingredient Reproductive Toxicity Data
Oral Exposure Route

If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Human TD∟∘	2700 mg/kg	39 weeks	Specific Developmental Abnormalities Endocrine System	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Human TD∟∘	3240 mg/kg	39 weeks	Effects on Newborn Other neonatal measures or effects Physical Specific Developmental Abnormalities Endocrine system	RTECS (Registry of Toxic Effects of Chemical Substances)

 Inhalation (Dust/Mist) Exposure Route
 If available, see data below

 Inhalation (Vapor) Exposure Route
 If available, see data below

 Inhalation (Gas) Exposure Route
 If available, see data below

12. ECOLOGICAL INFORMATION

Ecotoxicity Not considered to be harmful to aquatic life

Product Ecological Data

Aquatic toxicity

Fish No data available Crustacea No data available

EN / AGHS Page 12/17



Product Name DPD Total Chlorine Reagent

Revision Date 04-May-2018

Page 13 / 17

Algae No data available

Ingredient Ecological Data

Aquatic toxicity

Fish		lf available, see ingredient data below				
Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data	
Glycine, N,N-1,2-ethanediylbis [N-(carboxymethyl)-, disodium salt, dihydrate (<1%) CAS#: 6381-92-6	96 hours	Lepomis macrochirus	LC50	159 mg/L	Vendor SDS	
A		16.2	Different Commontant - Avenue Common	and the second second	3000 t 200 cm cm	

Crustacea		If available, see ingredient data below				
Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data	
Salt of N,N-Diethyl-p-Phenyl enediamine (1 - 5%) CAS#: -	48 Hours	Daphina magna	EC50	10.8 mg/L	Internal Data	

Algae		lf available, see ingredient data below				
Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data	
Glycine, N,N-1,2-ethanediylbis [N-(carboxymethyl)-, disodium salt, dihydrate (<1%) CAS#: 6381-92-6	72 Hours	None reported	EC50	10 mg/L	Vendor SDS	

Other Information

Persistence and degradability

Product Biodegradability Data

No data available.

Ingredient Biodegradability Data

Chemical name	Test method	Biodegradation	Exposure time	Results
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	Inorganic Salt	None reported	None reported	Not readily biodegradable
Salt of N,N-Diethyl-p-Phenyl enediamine (1 - 5%) CAS#: -	None reported	None reported	None reported	Not determined

Bioaccumulation

Product Bioaccumulation Data

No data available.

EN / AGHS Page 13/17



Product Name DPD Total Chlorine Reagent

Revision Date 04-May-2018

Page 14 / 17

log Kow ~ 0

Partition Coefficient (n-octanol/water)

Ingredient Bioaccumulation Data

Chemical name	Test method	Exposure time	Species	Bioconcentrat ion factor (BCF)	Results
Potassium iodide (KI) (20 - 30%) CAS#: 7681-11-0	None reported	None reported	None reported	None reported	Not determined
Salt of N,N-Diethyl-p-Phenyl enediamine (1 - 5%) CAS#: -	None reported	None reported	None reported	None reported	Not determined
Glycine, N,N-1,2-ethanediylbis [N-(carboxymethyl)-, disodium salt, dihydrate (<1%) CAS#: 6381-92-6	None reported	None reported	None reported	None reported	Not determined

Mobility

Soil Organic Carbon-Water Partition Coefficient

log K₀c ~ 0

Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Other adverse effects

No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused products

Dispose of in accordance with local regulations. Dispose of waste in accordance with

environmental legislation.

Contaminated packaging Do not reuse empty containers.

14. TRANSPORT INFORMATION

 U.S. DOT
 Not regulated

 TDG
 Not regulated

 IATA
 Not regulated

 IMDG
 Not regulated

EN / AGHS Page 14/17



Product Name DPD Total Chlorine Reagent

Revision Date 04-May-2018

Page 15 / 17

Note: No special precautions necessary.

Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods.

If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories

TSCA Complies DSL/NDSL Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EINECS/ELINCS Complies **ENCS** Complies **IECSC** Complies **KECL** Complies **PICCS** Complies **TCSI** Complies Complies AICS **NZIoC** Complies

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substances Inventory

AICS - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

US Federal Regulations

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

Acute health hazard Yes Chronic Health Hazard No Fire hazard No Sudden release of pressure hazard No Reactive Hazard No

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sodium phosphate dibasic 7558-79-4	5000 lb		-	X

EN / AGHS Page 15/17



Product Name DPD Total Chlorine Reagent Revision Date 04-May-2018

Page 16 / 17

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Sodium phosphate dibasic	5000 lb		RQ 5000 lb final RQ
7558-79-4			RQ 2270 kg final RQ

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

New Jersey Trade Secret Registry Number 80100131-5001 (Carboxylate Salt) New Jersey Trade Secret Registry Number 80100131-5002 (DPD Salt) New York Trade Secret Registry Number 478 (DPD Salt) New York Trade Secret Registry Number 479 (Carboxylate Salt) This product complies with Pennsylvania Trade Secret Regulations. This product is registered as a trade secret in the state of Illinois. This product is registered as a trade secret in the state of Massachusetts. This product is registered as a trade secret in the state of New York.

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Sodium phosphate dibasic 7558-79-4	Х	Х	X

U.S. EPA Label Information

Chemical name	FIFRA	FDA
Sodium phosphate dibasic	180.0910	21 CFR 182.1778,21 CFR 182.6290,21 CFR 182.6778,21 CFR 182.8778
Potassium iodide (KI)	180.0940	21 CFR 184.1634

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Special Comments

None

Additional information

Global Automotive Declarable Substance List (GADSL) Not applicable

NFPA and HMIS Classifications

NFPA	Health hazards - 2	Flammability - 0	Instability - 0	Physical and Chemical Properties -
HMIS	Health hazards - 2	Flammability - 0	Physical Hazards - 0	Personal protection - X - See section 8 for more
				information

Key or legend to abbreviations and acronyms used in the safety data sheet

EN / AGHS	Page 16/17
	No.

LA-UR-19-22215



Product Code(s) 2105669 Issue Date 30-04-2018 Version 5.4

Product Name DPD Total Chlorine Reagent

Revision Date 04-May-2018

Page 17 / 17

NIOSH IDLH Immediately Dangerous to Life or Health

ACGIH ACGIH (American Conference of Governmental Industrial Hygienists)

NDF no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)

MAC Maximum Allowable Concentration Ceiling Ceiling Limit Value

X Listed Vacated These values have no official status. The only

binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state

regulations.

 SKN*
 Skin designation
 SKN+
 Skin sensitization

 RSP+
 Respiratory sensitization
 **
 Hazard Designation

 C
 Carcinogen
 R
 Reproductive toxicant

M mutagen

Prepared By Hach Product Compliance Department

 Issue Date
 30-04-2018

 Revision Date
 04-May-2018

Revision Note None

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY©2018

End of Safety Data Sheet

EN / AGHS Page 17/17



HACH 2263411





SAFETY DATA SHEET

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018 Version 7.1 Page 1/15

1. IDENTIFICATION

Product identifier

Product Name Total Chlorine Indicator

Other means of identification

Safety data sheet number

Product Code(s) 2263411

UN/ID no UN2796

Recommended use of the chemical and restrictions on use

Recommended Use Laboratory Use. Total chlorine analyzer reagent.

M00469

Uses advised against No information available.

Restrictions on use Not applicable.

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

Emergency telephone number

+1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Corrosive to metals	Category 1	
Skin corrosion/irritation	Category 2	
Serious eye damage/eye irritation	Category 1	

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Signal word - Danger

EN / AGHS Page 1/15



Product Name Total Chlorine Indicator Revision Date 17-Apr-2018 Page 2/15



Hazard statements

H290 - May be corrosive to metals H315 - Causes skin irritation

H318 - Causes serious eye damage

Precautionary statements

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P302 + P352 - IF ON SKIN: Wash with plenty of soap and water

P332 + P313 - If skin irritation occurs: Get medical advice/attention

P362 - Take off contaminated clothing and wash before reuse

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to

do. Continue rinsing

P310 - Immediately call a POISON CENTER or doctor/physician

P234 - Keep only in original container

P390 - Absorb spillage to prevent material damage

Other Hazards Known

Not applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable

Mixture

Chemical Family Mixture.

Chemical nature Inorganic acid in aqueous solution.

Percent ranges are used where confidential product information is applicable.

Chemical name	CAS No. Percent Range		HMRIC#	
Sulfuric acid	7664-93-9	5 - 10%		

EN / AGHS Page 2/15



Product Name Total Chlorine Indicator

Revision Date 17-Apr-2018

Page 3/15

4. FIRST AID MEASURES

Description of first aid measures

General advice Show this safety data sheet to the doctor in attendance. Immediate medical attention is

required.

Inhalation Remove to fresh air. Get medical attention immediately if symptoms occur.

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Remove contact lenses, if present and easy to do. Continue rinsing. Keep eye wide open while rinsing. Do not rub affected area. Get immediate medical advice/attention.

Skin contact Wash off immediately with soap and plenty of water for at least 15 minutes. Get medical

attention if irritation develops and persists.

Ingestion Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth

to an unconscious person. Do NOT induce vomiting. Call a physician.

Self-protection of the first aider Avoid contact with skin, eyes or clothing.

Most important symptoms and effects, both acute and delayed

Symptoms Burning sensation.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. FIRE-FIGHTING MEASURES

surrounding environment

Unsuitable Extinguishing Media Caution: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the

chemical

No information available.

Hazardous combustion products May emit toxic and corrosive fumes.

Special protective equipment for

fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout

gear.

6. ACCIDENTAL RELEASE MEASURES

U.S. Notice Only persons properly qualified to respond to an emergency involving hazardous

substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and

guidelines/procedures. See Section 13, Special Instructions for disposal assistance.
Outside of the US, only persons properly qualified according to state or local regulations

should respond to a spill involving chemicals.

Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal

protective equipment as required.

Other Information Refer to protective measures listed in Sections 7 and 8.

EN / AGHS Page 3/15



Product Name Total Chlorine Indicator

Revision Date 17-Apr-2018

Page 4/15

Environmental precautions

Environmental precautions Prevent further leakage or spillage if safe to do so.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so. Methods for cleaning up Pick up and transfer to properly labeled containers.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

Reference to other sections See section 8 for more information. See section 13 for more information.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with

skin, eyes or clothing. Do not eat, drink or smoke when using this product. Take off

contaminated clothing and wash before reuse.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from

moisture. Store locked up. Keep out of the reach of children. Store away from other

materials.

Flammability class Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Sulfuric acid	TWA: 0.2 mg/m ³	TWA: 1 mg/m ³	IDLH: 15 mg/m ³
CAS#: 7664-93-9	=	(vacated) TWA: 1 mg/m ³	TWA: 1 mg/m ³

Appropriate engineering controls

Engineering Controls

Showers Eyewash stations Ventilation systems.

Individual protection measures, such as personal protective equipment

No protective equipment is needed under normal use conditions. If exposure limits are Respiratory protection

exceeded or irritation is experienced, ventilation and evacuation may be required.

Hand Protection Wear suitable gloves. Impervious gloves.

Tight sealing safety goggles. Eyelface protection

Skin and body protection Wear suitable protective clothing. Long sleeved clothing

General Hygiene Considerations Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Regular cleaning of equipment, work area and clothing is recommended. Avoid

EN / AGHS Page 4/15



Product Name Total Chlorine Indicator

Revision Date 17-Apr-2018

Page 5/15

contact with skin, eyes or clothing.

Environmental exposure controls Local authorities should be advised if significant spillages cannot be contained. Do not

allow into any sewer, on the ground or into any body of water.

Thermal hazards None under normal processing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state

Appearance Odoraqueous solution NoneColor Color less Odor thresholdcolorless Not applicable

Liquid

Property Values Remarks • Method

Molecular weight Not applicable

pH < 0.5

Melting point/freezing point ~ -1 °C / 30.2 °F Estimation based on theoretical

calculation

Boiling point / boiling range $\sim 100 \, ^{\circ}\text{C} \, / \, 212 \, ^{\circ}\text{F}$ @ $100 \, ^{\circ}\text{C} \, \text{Estimation based on}$

theoretical calculation

Evaporation rate 0.81 (water = 1)

calculation

Vapor density (air = 1) 0.03 (air = 1)

Specific gravity (water = 1 / air = 1) 1.056

Partition Coefficient (n-octanol/water)

Not applicable

Soil Organic Carbon-Water Partition

Coefficient

Not applicable

Autoignition temperature

Decomposition temperature

No data available

Dynamic viscosity

No data available

Kinematic viscosity

No data available

Solubility(ies)

Water solubility

Water solubility classification	Water solubility_	Water Solubility Temperature	
Soluble	> 1000 mg/L	25 °C / 77 °F	

Solubility in other solvents

Chemical Name	Solubility classification	Solubility	Solubility Temperature
Acid	Soluble	> 1000 mg/L	25 °C / 77 °F

EN / AGHS	Page 5/15
EN 7 AGRS	Page 5/15



Product Code(s) 2263411 Product Name Total Chlorine Indicator

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 7.1 Page 6/15

Other Information

Metal Corrosivity

Classified as corrosive to metal according to GHS criteria

Steel Corrosion Rate19.62 mm/yr / 0.77 in/yrAluminum Corrosion Rate7.37 mm/yr / 0.29 in/yr

Volatile Organic Compounds (VOC) Content

Chemical name	CAS No.	Volatile organic compounds (VOC) content	CAA (Clean Air Act)
Sulfuric acid	7664-93-9	No data available	-

Explosive properties

Upper explosion limit No data available Lower explosion limit No data available

Flammable properties

Flash point No data available

Flammability Limit in Air

Upper flammability limit:
Lower flammability limit:
No data available

Particle Size No information available

Particle Size Distribution No information available

10. STABILITY AND REACTIVITY

Reactivity

Not applicable.

Chemical stability

Stability Stable under normal conditions.

Explosion data

Sensitivity to Mechanical Impact None Sensitivity to Static Discharge None.

Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing.

Hazardous polymerization

Hazardous polymerization does not occur.

Conditions to avoid

Conditions to avoid Exposure to air or moisture over prolonged periods.

Incompatible materials

Incompatible materials Oxidizing agent. Strong acids. Strong bases.

EN / AGHS Page 6/15



Product Name Total Chlorine Indicator

Revision Date 17-Apr-2018

Page 7 / 15

Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information

Inhalation May cause irritation of respiratory tract.

Eye contact Severely irritating to eyes. Causes serious eye damage. May cause burns. May cause

irreversible damage to eyes.

Skin contact Causes skin irritation.

Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Ingestion

Symptoms Redness. Burning. May cause blindness. May cause redness and tearing of the eyes.

Toxicologically synergistic

Aggravated Medical Conditions Skin disorders. Eye disorders. Preexisting eye disorders. Respiratory disorders. Teeth.

None known.

products

Toxicokinetics, metabolism and See ingredients information below.

distribution

	Chemical name	Toxicokinetics, metabolism and distribution
I		The corrosivity of sulfuric acid makes it difficult to assess its effects on metabolism. Its corrosivity is also the
1	(5 - 10%)	main contributor to acute deaths, therefore it is not classified for acute toxicity.
١	CAS#: 7664-93-9	*

Product Acute Toxicity Data

Oral Exposure Route No data available **Dermal Exposure Route** No data available Inhalation (Dust/Mist) Exposure Route No data available Inhalation (Vapor) Exposure Route No data available Inhalation (Gas) Exposure Route No data available

Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

Acute Toxicity Estimations (ATE)

ATEmix (oral)	No information available
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	No information available
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

Ingredient Acute Toxicity Data

Oral Exposure Route If available, see data below					
Chemical name Endpoint R		Reported	Exposure	Toxicological effects Key literature references ar	Key literature references and
	type	dose	time		sources for data
Sulfuric acid	Rat	2140 mg/kg	None	None reported	IUCLID (The International
(5 - 10%)	LD ₅₀		reported		Uniform Chemical Information
CAS#: 7664-93-9			· ·		Database)

Dermal Exposure Route If available, see data below

EN / AGHS	Page 7/15



Product Code(s) 2263411 Issue Date 17-Apr-2018

11 Product Name Total Chlorine Indicator Revision Date 17-Apr-2018

Version 7.1 Page 8/15

Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below

	Chemical name	Endpoint	Reported	Exposure	Toxicological effects	Key literature references and
		type	dose	time	99001	sources for data
	Sulfuric acid (5 - 10%)	Rat LC50	0.510 mg/L	None reported	None reported	LOLI
	CAS#: 7664-93-9					

Inhalation (Gas) Exposure Route

If available, see data below

Product Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
Inhalation (Gas) Exposure Route
No data available

Ingredient Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (5 - 10%) CAS#: 7664-93-9	Human TD∟₀	0.144 mg/L	5 minutes	Lungs, Thorax, or Respiration Dyspnea	RTECS (Registry of Toxic Effects of Chemical Substances)

Inhalation (Gas) Exposure Route If available, see data below

Aspiration toxicity
If available, see data below

Kinematic viscosity

No data available

Product Skin Corrosion/Irritation Data

Test data reported below.

100	rest data reported per	O 111.				
	Test method	Species	Reported dose	Exposure	Results	Key literature references and
	Organization for	Rabbit	0.5 mL	time	Not corrosive	sources for data
	Economic			4 hours	to skin	Outside testing
	Co-operation and					****
	Development					
	(OECD) - Test 404:					
	Acute Dermal					
	Corrosion/Irritation					

Ingredient Skin Corrosion/Irritation Data

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sulfuric acid (5 - 10%) CAS#: 7664-93-9	Existing human experience	Human	None reported	None reported	Corrosive to skin	HSDB (Hazardous Substances Data Bank)

Product Serious Eye Damage/Eye Irritation Data

No data available.

Ingredient Eye Damage/Eye Irritation Data

If available, see data below

I I I I I I sources for data

EN / AGHS	Page 8/15



Product Code(s) 2263411 Issue Date 17-Apr-2018

Version 7.1

Product Name Total Chlorine Indicator

Revision Date 17-Apr-2018

Page 9/15

Sulfuric acid (5 - 10%)	Existing human experience	Human	None reported	None reported	Corrosive to eyes	HSDB (Hazardous Substances Data
CAS#: 7664-93-9	Схрепенее		reported	reported		Bank)

Sensitization Information

Product Sensitization Data

Skin Sensitization Exposure Route No data available Respiratory Sensitization Exposure Route No data available

Ingredient Sensitization Data

Skin Sensitization Exposure Route If available, see data below. Respiratory Sensitization Exposure Route If available, see data below.

Chronic Toxicity Information

Product Specific Target Organ Toxicity Repeat Dose Data

Oral Exposure Route No data available. Dermal Exposure Route No data available. Inhalation (Dust/Mist) Exposure Route No data available Inhalation (Vapor) Exposure Route No data available. Inhalation (Gas) Exposure Route No data available.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (5 - 10%) CAS#: 7664-93-9	Human TC∟₀	.003 mg/L	168 days	Musculoskeletal Changes in teeth and supporting structures	RTECS (Registry of Toxic Effects of Chemical Substances)

Inhalation (Gas) Exposure Route If available, see data below

Product Carcinogenicity Data

No data available Oral Exposure Route Dermal Exposure Route No data available No data available Inhalation (Dust/Mist) Exposure Route Inhalation (Vapor) Exposure Route No data available Inhalation (Gas) Exposure Route No data available

Ingredient Carcinogenicity Data

Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
Sulfuric acid	7664-93-9	A2	Group 1	Known	X

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	A2 - Suspected Human Carcinogen
IARC (International Agency for Research on Cancer)	Group 1 - Carcinogenic to Humans
NTP (National Toxicology Program)	Known - Known Carcinogen
OSHA (Occupational Safety and Health Administration of the US Department of	X - Present
Labor)	

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Germ Cell Mutagenicity invitro Data

EN / AGHS Page 9/15

LA-UR-19-22215



Product Name Total Chlorine Indicator

Revision Date 17-Apr-2018

Page 10 / 15

No data available.

Ingredient Germ Cell Mutagenicity invitro Data

If available, see data below

Chemical name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Sulfuric acid (5 - 10%) CAS#: 7664-93-9	Cytogenetic analysis	Hamster ovary	4 mmol/L	None reported	Positive test result for mutagenicity	No information available

Product Germ Cell Mutagenicity invivo Data

Oral Exposure Route No data available **Dermal Exposure Route** No data available Inhalation (Dust/Mist) Exposure Route Inhalation (Vapor) Exposure Route No data available No data available Inhalation (Gas) Exposure Route No data available

Ingredient Germ Cell Mutagenicity invivo Data

Oral Exposure Route If available, see data below **Dermal Exposure Route** If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below If available, see data below Inhalation (Gas) Exposure Route

Product Reproductive Toxicity Data

Oral Exposure Route No data available No data available **Dermal Exposure Route** Inhalation (Dust/Mist) Exposure Route No data available Inhalation (Vapor) Exposure Route No data available Inhalation (Gas) Exposure Route No data available

Ingredient Reproductive Toxicity Data

Oral Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below

minaration (vapor) =	thooare itoat	•		ii available, eee data belett	100
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (5 - 10%) CAS#: 7664-93-9	Rabbit TC∟₀	.02 mg/L	7 hours	Specific Developmental Abnormalities Musculoskeletal system	No information available

Inhalation (Gas) Exposure Route If available, see data below

12. ECOLOGICAL INFORMATION

Ecotoxicity

Product Ecological Data

Aquatic toxicity

Fish No data available Crustacea No data available Algae No data available

Ingredient Ecological Data

Aquatic toxicity

Fish If available, see ingredient data below

EN / AGHS Page 10/15



Product Code(s) 2263411 Issue Date 17-Apr-2018

Version 7.1

Product Name Total Chlorine Indicator

Revision Date 17-Apr-2018

Page 11 / 15

Crustacea If available, see ingredient data below Algae

No data available

Other Information

Persistence and degradability

Product Biodegradability Data

No data available.

Ingredient Biodegradability Data

Bioaccumulation

Product Bioaccumulation Data

No data available.

Partition Coefficient (n-octanol/water) Not applicable

Ingredient Bioaccumulation Data

Mobility

Soil Organic Carbon-Water Partition Coefficient Not applicable

Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Other adverse effects No information available

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused

products

Dispose of in accordance with local regulations. Dispose of waste in accordance with

environmental legislation.

Contaminated packaging Do not reuse empty containers.

US EPA Waste Number D002

Special instructions for disposal Work in an approved fume hood. Dilute material with excess water making a weaker than

5% solution. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Open cold water tap completely, slowly pour the reacted material to the drain.

Allow cold water to run for 5 minutes to completely flush the system.

14. TRANSPORT INFORMATION

U.S. DOT

UN/ID no UN2796

Sulfuric acid solution Proper shipping name

EN / AGHS Page 11 / 15



Product Code(s) 2263411 Product Name Total Chlorine Indicator

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 7.1 Page 12/15

Hazard Class Packing Group

Reportable Quantity (RQ) Sulfuric acid: RQ kg= 4637.39 UN2796, Sulfuric acid solution, 8, II Description

Emergency Response Guide

Number

TDG

UN/ID no UN2796 Proper shipping name Battery fluid, acid

Hazard Class Packing Group II

Description UN2796, Battery fluid, acid, 8, II

IATA

UN/ID no

Proper shipping name Sulphuric acid solution

Hazard Class 8 **Packing Group** II ERG Code

UN2796, Sulphuric acid solution, 8, II Description

IMDG

UN/ID no UN2796 Proper shipping name Sulphuric acid

Hazard Class 8 **Packing Group** EmS-No F-A, S-B

Description UN2796, Sulphuric acid, 8, II

Note: No special precautions necessary.

Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods.

If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories

Complies **TSCA** DSL/NDSL Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EINECS/ELINCS Complies Complies **ENCS** Complies **IECSC** KECL Complies **PICCS** Complies Complies TCSI AICS Complies NZIoC Complies

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances IECSC - China Inventory of Existing Chemical Substances

EN / AGHS Page 12/15

LA-UR-19-22215



Product Name Total Chlorine Indicator

Revision Date 17-Apr-2018

Page 13 / 15

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substances Inventory

AICS - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical name	SARA 313 - Threshold Values %
Sulfuric acid (CAS #: 7664-93-9)	1.0

SARA 311/312 Hazard Categories

Acute health hazard	Yes
Chronic Health Hazard	Yes
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sulfuric acid	1000 lb	82T 821	<u>=</u>	X
7664-93-9				

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

Chemical name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Sulfuric acid	1000 lb	1000 lb	RQ 1000 lb final RQ
7664-93-9			RQ 454 kg final RQ

U.S. - DEA (Drug Enforcement Administration) List I & List II

Chemical name	U.S DEA (Drug Enforcement Administration) - List I or Precursor Chemicals	U.S DEA (Drug Enforcement Administration) - List II or Essential Chemicals
Sulfuric acid (5 - 10%) CAS#: 7664-93-9	Not Listed	50 gallon Export Volume (exports, transshipments and international transactions to designated countries)

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

IMERC: Not applicable

EN / AGHS	Page 13/15



Product Name Total Chlorine Indicator

Revision Date 17-Apr-2018

Page 14/15

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Sulfuric acid	X	X	X
7664-93-9			

U.S. EPA Label Information

Chemical name	FIFRA	FDA
Sulfuric acid	180.0910	21 CFR 184.1095

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Special Comments

None

Additional information

Global Automotive Declarable Substance List (GADSL)

Not applicable

NFPA and HMIS Classifications

NFPA	Health hazards - 3	Flammability - 0	Instability - 0	Physical and Chemical Properties -
HMIS	Health hazards - 3	Flammability - 0	Physical Hazards - 0	Personal protection - X - See section 8 for more information

Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH Immediately Dangerous to Life or Health

ACGIH (American Conference of Governmental Industrial Hygienists)

NDF no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)

MAC Maximum Allowable Concentration Ceiling Ceiling Limit Value

X Listed Vacated These values have no official status. The only

binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state

regulations.

 SKN*
 Skin designation
 SKN+
 Skin sensitization

 RSP+
 Respiratory sensitization
 **
 Hazard Designation

 C
 Carcinogen
 R
 Reproductive toxicant

M mutagen

Prepared By Hach Product Compliance Department

Issue Date 17-Apr-2018

EN / AGHS Page 14/15



Product Code(s) 2263411 Issue Date 17-Apr-2018

Version 7.1

Product Name Total Chlorine Indicator

Revision Date 17-Apr-2018

Page 15 / 15

Revision Date 17-Apr-2018

Revision Note SDS sections updated

2

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY@2018

End of Safety Data Sheet

EN / AGHS Page 15/15



HACH 2263511





SAFETY DATA SHEET

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018 Version 3.2 Page 1/18

1. IDENTIFICATION

Product identifier

Product Name Total Chlorine Buffer Solution

Other means of identification

 Product Code(s)
 2263511

 Safety data sheet number
 M00470

 UN/ID no
 UN1824

Recommended use of the chemical and restrictions on use

Recommended Use Buffer.
Uses advised against None.
Restrictions on use None.

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

Emergency telephone number

+1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Corrosive to metals	Category 1
Skin corrosion/irritation	Category 1
Serious eye damage/eye irritation	Category 1

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Signal word - Danger

EN / AGHS Page 1/18



Product Name Total Chlorine Buffer Solution Revision Date 17-Apr-2018

Page 2/18



Hazard statements

H290 - May be corrosive to metals

H314 - Causes severe skin burns and eye damage

Precautionary statements

P260 - Do not breathe dust/fume/gas/mist/vapors/spray

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting
P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P310 - Immediately call a POISON CENTER or doctor/physician

P363 - Wash contaminated clothing before reuse

P405 - Store locked up

P501 - Dispose of contents/ container to an approved waste disposal plant

P234 - Keep only in original container

P390 - Absorb spillage to prevent material damage

Other Hazards Known

Not applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable

Mixture

Percent ranges are used where confidential product information is applicable.

Chemical name	CAS No.	Percent Range	HMRIC #
Potassium iodide (KI)	7681-11-0	5-10%	B .5.
Sodium hydroxide	1310-73-2	1 - 5%	(a)
Decyl phenoxybenzenedisulfonic acid, disodium salt	36445-71-3	<1%	2
Tetrasodium EDTA	64-02-8	<1%	
Benzenesulfonic acid, oxybis[decyl-, disodium salt	70146-13-3	< 0.1%) Yi
Sodium sulfite	7757-83-7	<0.1%	#

Page 2/18 EN / AGHS



Product Name Total Chlorine Buffer Solution

Revision Date 17-Apr-2018

Page 3/18

4. FIRST AID MEASURES

Description of first aid measures

General advice Show this safety data sheet to the doctor in attendance. Immediate medical attention is

required.

Inhalation Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical

attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. Get immediate medical

advice/attention.

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Remove contact lenses, if present and easy to do. Continue rinsing. Keep eye wide open

while rinsing. Do not rub affected area. Get immediate medical advice/attention.

Skin contact Wash off immediately with soap and plenty of water while removing all contaminate

Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get immediate medical advice/attention.

Ingestion Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth

to an unconscious person. Do NOT induce vomiting. Get immediate medical

advice/attention.

Self-protection of the first aider Avoid contact with skin, eyes or clothing. Ensure that medical personnel are aware of the

material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid direct contact with skin. Use barrier to give mouth-to-mouth

resuscitation.

Most important symptoms and effects, both acute and delayed

Symptoms Burning sensation.

Indication of any immediate medical attention and special treatment needed

Note to physicians Product is a corrosive material. Use of gastric lavage or emesis is contraindicated.

Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood

pressure may occur with moist rales, frothy sputum, and high pulse pressure.

5. FIRE-FIGHTING MEASURES

surrounding environment.

Unsuitable Extinguishing Media Caution: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the

chemical

The product causes burns of eyes, skin and mucous membranes. Thermal decomposition

can lead to release of irritating gases and vapors.

Hazardous combustion products lodine compounds. Carbon monoxide, Carbon dioxide.

Special protective equipment for

fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout

gear.

6. ACCIDENTAL RELEASE MEASURES

EN / AGHS Page 3/18



Product Code(s) 2263511 Issue Date 17-Apr-2018

Product Name Total Chlorine Buffer Solution

Revision Date 17-Apr-2018

Page 4/18

U.S. Notice

Version 3.2

Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations should respond to a spill involving chemicals.

Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal

protective equipment as required. Attention! Corrosive material. Evacuate personnel to

safe areas. Keep people away from and upwind of spill/leak.

Refer to protective measures listed in Sections 7 and 8. Other Information

Environmental precautions

Prevent further leakage or spillage if safe to do so. Should not be released into the **Environmental precautions**

environment. Do not allow to enter into soil/subsoil. Prevent product from entering drains.

Methods and material for containment and cleaning up

Prevent further leakage or spillage if safe to do so. Methods for containment Methods for cleaning up Pick up and transfer to properly labeled containers.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

Reference to other sections See section 8 for more information. See section 13 for more information.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with

skin, eyes or clothing. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation. Do not eat, drink or smoke when using this product. Take off contaminated

clothing and wash before reuse.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from

moisture. Store locked up. Keep out of the reach of children. Store away from other

materials.

Flammability class Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Potassium iodide (KI) CAS#: 7681-11-0	TWA: 0.01 ppm	NDF	NDF
Sodium hydroxide	Ceiling: 2 mg/m ³	TWA: 2 mg/m ³	IDLH: 10 mg/m ³



Product Code(s) 2263511 Issue Date 17-Apr-2018

Version 3.2

Product Name Total Chlorine Buffer Solution

Revision Date 17-Apr-2018

Page 5/18

CAS#: 1310-73-2 (vacated) Ceiling: 2 mg/m³ Ceiling: 2 mg/m³

Appropriate engineering controls

Engineering Controls

Showers Eyewash stations

Ventilation systems.

Individual protection measures, such as personal protective equipment

Respiratory protection

No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required

Hand Protection Wear suitable gloves. Impervious gloves.

Eyelface protection Face protection shield.

Skin and body protection Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron.

General Hygiene Considerations

Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Regular cleaning of equipment, work area and clothing is recommended. Avoid contact with skin, eyes or clothing. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Contaminated work clothing should not be allowed out of the workplace. Wash hands before breaks and immediately after handling the product.

Environmental exposure controls

Local authorities should be advised if significant spillages cannot be contained. Do not

allow into any sewer, on the ground or into any body of water.

Thermal hazards None under normal processing

CHEMICAL PROPERTIES PHYSICAL AND

Information on basic physical and chemical properties

Physical state **Appearance**

Odor

Liquid aqueous solution

Color colorless None

Odor threshold No data available

Property Values Remarks • Method

No data available Molecular weight

11.9 pΗ

~ -13 °C / 9 °F Melting point/freezing point Estimation based on theoretical

calculation

106 °C / 223 °F Boiling point / boiling range **Evaporation rate** 0.61 (water = 1)

22.427 mm Hg / 2.99 kPa at 25 °C / 77 °F Estimation based on theoretical Vapor pressure

calculation

Vapor density (air = 1) 0.62 (air = 1)

Specific gravity (water = 1 / air = 1) 1.246

Partition Coefficient (n-octanol/water) Not applicable Soil Organic Carbon-Water Partition Not applicable

Coefficient

EN / AGHS Page 5/18

E-105 of 208



Product Code(s) 2263511 Product Name Total Chlorine Buffer Solution

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 3.2 Page 6/18

Autoignition temperature

Decomposition temperature

No data available

Solubility(ies)

Water solubility

Water solubility classification	Water solubility_	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Solubility in other solvents

Chemical Name	Solubility classification	<u>Solubility</u>	Solubility Temperature
Acid	Soluble	> 1000 mg/L	25 °C / 77 °F

Other Information

Metal Corrosivity

Classified as corrosive to metal according to GHS criteria

Steel Corrosion Rate
Aluminum Corrosion Rate

0.25 mm/yr / 0.01 in/yr 754.63 mm/yr / 29.71 in/yr

Volatile Organic Compounds (VOC) Content

Chemical name	CAS No.	Volatile organic compounds (VOC) content	CAA (Clean Air Act)
Potassium iodide (KI)	7681-11-0	Not applicable	<u>~</u>
Sodium hydroxide	1310-73-2	No data available	-
Decyl phenoxybenzenedisulfonic acid, disodium salt	36445-71-3	No data available	-
Tetrasodium EDTA	64-02-8	No data available	=
Benzenesulfonic acid, oxybis[decyl-, disodium salt	70146-13-3	No data available	-
Sodium sulfite	7757-83-7	No data available	

Explosive properties

Upper explosion limit No data available Lower explosion limit No data available

Flammable properties

Flash point No data available

Flammability Limit in Air

Upper flammability limit:
Lower flammability limit:
No data available
No data available
No data available.

Bulk density Not applicable

Particle Size No information available

EN / AGHS Page 6/18



Product Code(s) 2263511 Issue Date 17-Apr-2018

Version 3.2

Product Name Total Chlorine Buffer Solution

Revision Date 17-Apr-2018

Page 7/18

Particle Size Distribution No information available

10. STABILITY AND REACTIVITY

Reactivity

Not applicable.

Chemical stability

Stability Stable under normal conditions

Explosion data

Sensitivity to Mechanical Impact None Sensitivity to Static Discharge None.

Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing.

Hazardous polymerization None under normal processing.

Conditions to avoid

Conditions to avoid Exposure to air or moisture over prolonged periods.

Incompatible materials

Incompatible materials Oxidizing agent. Acids. Bases.

Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information

Inhalation Corrosive by inhalation. Inhalation of corrosive fumes/gases may cause coughing, choking,

headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs.

Pulmonary edema can be fatal.

Eye contact Causes burns. Corrosive to the eyes and may cause severe damage including blindness.

Causes serious eye damage. May cause irreversible damage to eyes.

Skin contact May cause irritation.

Causes burns. Ingestion causes burns of the upper digestive and respiratory tracts. May Ingestion

cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung

damage if swallowed. May be fatal if swallowed and enters airways.

Symptoms 5 4 1 Redness. Burning. May cause blindness. Coughing and/ or wheezing

Aggravated Medical Conditions Eye disorders. Skin disorders. Respiratory disorders. Preexisting eye disorders.

Toxicologically synergistic products

None known.

Toxicokinetics, metabolism and See ingredients information below.

distribution

EN / AGHS Page 7/18



Product Name Total Chlorine Buffer Solution

Revision Date 17-Apr-2018

Page 8/18

Chemical name	Toxicokinetics, metabolism and distribution
Potassium iodide (KI)	May cross placenta and be excreted in breast milk. May react synergistically with mercury.
(5 - 10%)	
CAS#: 7681-11-0	

Product Acute Toxicity Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
Inhalation (Gas) Exposure Route
No data available

Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

Acute Toxicity Estimations (ATE)

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)	34,608.00 mg/kg
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	No information available
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

Ingredient Acute Toxicity Data

Oral Exposure Route				If available, see data below	_
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium iodide (KI) (5 - 10%) CAS#: 7681-11-0	Rat LD50	2779 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)
Decyl phenoxybenzenedisul fonic acid, disodium salt (<1%) CAS#: 36445-71-3	Rat LD50	1000 mg/kg	None reported	None reported	EPA (United States Environmental Protection Agency)
Tetrasodium EDTA (<1%) CAS#: 64-02-8	Rat LD50	1658 mg/kg	None reported	None reported	ERMA (New Zealands Environmental Risk Management Authority)
Sodium sulfite (<0.1%) CAS#: 7757-83-7	Rat LD50	3560 mg/kg	None reported	None reported	GESTIS (Information System on Hazardous Substances of the German Social Accident Insurance)
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium iodide (KI) (5 - 10%) CAS#: 7681-11-0	Mouse LD50	1000 mg/kg	None reported	None reported	Vendor SDS
Sodium hydroxide (1 - 5%) CAS#: 1310-73-2	Rabbit LD50	500 mg/kg	None reported	None reported	No information available
Dermal Exposure Ro	ute			If available, see data below	
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Decyl	Rabbit	2000 mg/kg	None	None reported	EPA (United States

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application

EN / AGHS

Page 8/18



Product Name Total Chlorine Buffer Solution

Revision Date 17-Apr-2018

Page 9/18

phenoxybenzenedisul fonic acid, disodium salt	LD50		reported		Environmental Protection Agency)
(<1%) CAS#: 36445-71-3					
Sodium sulfite (<0.1%) CAS#: 7757-83-7	Rat LD50	2000 mg/kg	None reported	None reported	EPA (United States Environmental Protection Agency)
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium iodide (KI) (5 - 10%) CAS#: 7681-11-0	Rat LD50	> 2000 mg/kg	None reported	None reported	ECHA (The European Chemicals Agency)
Sodium hydroxide (1 - 5%) CAS#: 1310-73-2	Rabbit LD50	1350 mg/kg	None reported	None reported	IUCLID (The International Uniform Chemical Information Database)
Inhalation (Dust/Mist)	Exposure R	oute		If available, see data below	
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sodium sulfite (<0.1%)	Rat LC50	5.5 mg/L	4 hours	None reported	ECHA (The European Chemicals Agency)

Inhalation (Vapor) Exposure Route Inhalation (Gas) Exposure Route

CAS#: 7757-83-7

If available, see data below If available, see data below

Product Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
No data available
No data available
No data available

Ingredient Specific Target Organ Toxicity Single Exposure Data

Chemical name Endpoint type Potassium iodide (KI) Mouse	Reported dose	Exposure	Toxicological effects	Key literature references and
28 C4 T 5 C2 C T C T C C C C C C C C C C C C C C	uose	time		sources for data
(5 - 10%) LD⊾₀ CAS#: 7681-11-0	1862 mg/kg	None reported	Lungs, Thorax, or Respiration Dyspnea	RTECS (Registry of Toxic Effects of Chemical Substances)

Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Aspiration toxicity

No data available

Product Skin Corrosion/Irritation Data

No data available.

Ingredient Skin Corrosion/Irritation Data

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Potassium iodide (KI) (5 - 10%) CAS#: 7681-11-0	Standard Draize Test	Rabbit	None reported	None reported	Skin irritant	Vendor SDS
Sodium hydroxide (1 - 5%)	Patch test	Human	20 mg	24 hours	Corrosive to skin	RTECS (Registry of Toxic Effects of

EN / AGHS Page 9/18



Product Name Total Chlorine Buffer Solution

Revision Date 17-Apr-2018

Page 10 / 18

CAS#: 1310-73-2						Chemical Substances)
Decyl phenoxybenzenedisul fonic acid, disodium salt (<1%) CAS#: 36445-71-3	None reported	Rabbit	None reported	None reported	Skin irritant	No information available
Sodium sulfite (<0.1%) CAS#: 7757-83-7	Standard Draize Test	Rabbit	500 mg	4 hours	Not corrosive or irritating to skin	ECHA (The European Chemicals Agency)

Product Serious Eye Damage/Eye Irritation Data

No data available.

Ingredient Eye Damage/Eye Irritation Data

If available, see data below

ii avaliable, see data b	CIOW					
Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Potassium iodide (KI) (5 - 10%) CAS#: 7681-11-0	Standard Draize Test	Rabbit	None reported	24 hours	Eye irritant	Vendor SDS
Sodium hydroxide (1 - 5%) CAS#: 1310-73-2	Standard Draize Test	Rabbit	0.05 mg	24 hours	Corrosive to eyes	RTECS (Registry of Toxic Effects of Chemical Substances)
Decyl phenoxybenzenedisul fonic acid, disodium salt (<1%) CAS#: 36445-71-3	None reported	Rabbit	None reported	None reported	Corrosive to eyes	No information available
Sodium sulfite (<0.1%) CAS#: 7757-83-7	Standard Draize Test	Rabbit	162 mg	None reported	Mild eye irritant	ECHA (The European Chemicals Agency)

Sensitization Information

Product Sensitization Data

Skin Sensitization Exposure Route
Respiratory Sensitization Exposure Route
No data available.
No data available.

Ingredient Sensitization Data

Skin Sensitization Exposure Route If available, see data below.

Chemical name	Test method	Species	Results	Key literature references and
				sources for data
Potassium iodide (KI)	Patch test	Human	Not confirmed to be a skin sensitizer	ERMA (New Zealands Environmental
(5 - 10%)				Risk Management Authority)
CAS#: 7681-11-0				-
Recoiratory Sensitiza	tion Evnosure Po	uto	If available see data below	,

Respiratory Sensitization Exposure Route			ii avallable, see uata below.	
Chemical name	Test method	Species	Results	Key literature references and
		,		sources for data
Sodium sulfite (<0.1%)	Based on human experience	Human	Confirmed to be a respiratory sensitizer	OECD (Organization for Economic Co-operation and Development)
CAS#: 7757-83-7	**			

Chronic Toxicity Information

Product Specific Target Organ Toxicity Repeat Dose Data

Oral Exposure Route

Dermal Exposure Route

No data available.
No data available.

EN / AGHS Page 10 / 18



Product Code(s) 2263511 Issue Date 17-Apr-2018

Version 3.2

Product Name Total Chlorine Buffer Solution

Revision Date 17-Apr-2018

Page 11 / 18

 Inhalation (Dust/Mist) Exposure Route
 No data available.

 Inhalation (Vapor) Exposure Route
 No data available.

 Inhalation (Gas) Exposure Route
 No data available.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

Oral Exposure Route lf available, see data below Chemical name Endpoint Toxicological effects Key literature references and Reported Exposure type dose time sources for data Potassium iodide (KI) Rat 0.5 mg/kg 90 days None reported ECHA (The European (5 - 10%)NOAEL Chemicals Agency) CAS#: 7681-11-0

Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Carcinogenicity Data

Oral Exposure RouteNo data availableDermal Exposure RouteNo data availableInhalation (Dust/Mist) Exposure RouteNo data availableInhalation (Vapor) Exposure RouteNo data availableInhalation (Gas) Exposure RouteNo data available

Ingredient Carcinogenicity Data

Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
Potassium iodide (KI)	7681-11-0	-		-	0.81
Sodium hydroxide	1310-73-2	-		-	l a
Decyl	36445-71-3	=	NES	5	(5)
phenoxybenzenedisulfonic acid, disodium salt					
Tetrasodium EDTA	64-02-8	-		-	
Benzenesulfonic acid, oxybis[decyl-, disodium salt	70146-13-3	-	6	E	ē
Sodium sulfite	7757-83-7	=	Group 3	ā.	(E)

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply
NTP (National Toxicology Program)	Does not apply
OSHA (Occupational Safety and Health Administration of the US Department of	Does not apply
Labor)	6100 UT

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Germ Cell Mutagenicity invitro Data

No data available.

Ingredient Germ Cell Mutagenicity invitro Data

If available, see data below

Chemical name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Potassium iodide (KI)	Cytogenetic	Rat ascites tumor	500 mg/kg	None	Positive test result for	RTECS (Registry
(5 - 10%)	analysis			reported	mutagenicity	of Toxic Effects of

EN / AGHS Page 11 / 18



Product Name Total Chlorine Buffer Solution

Revision Date 17-Apr-2018

Page 12/18

CAS#: 7681-11-0						Chemical Substances)
Sodium sulfite (<0.1%) CAS#: 7757-83-7	Cytogenetic analysis	Mouse sperm cells	25 mg/L	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Sodium sulfite (<0.1%) CAS#: 7757-83-7	None reported	Human lymphocyte	0.1 mmol/L	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)

Product Germ Cell Mutagenicity invivo Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
Inhalation (Gas) Exposure Route
No data available

Ingredient Germ Cell Mutagenicity invivo Data

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Reproductive Toxicity Data

Oral Exposure Route

Dermal Exposure Route

Inhalation (Dust/Mist) Exposure Route

Inhalation (Vapor) Exposure Route

Inhalation (Gas) Exposure Route

No data available
No data available
No data available
No data available

Ingredient Reproductive Toxicity Data

Oral Exposure Route If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium iodide (KI) (5 - 10%) CAS#: 7681-11-0	Human TD∟∘	2700 mg/kg	39 weeks	Specific Developmental Abnormalities Endocrine System	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium iodide (KI) (5 - 10%) CAS#: 7681-11-0	Human TD∟∘	3240 mg/kg	39 weeks	Effects on Newborn Other neonatal measures or effects Physical Specific Developmental Abnormalities Endocrine system	RTECS (Registry of Toxic Effects of Chemical Substances)

Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

12. ECOLOGICAL INFORMATION

Ecotoxicity

Product Ecological Data

EN / AGHS Page 12/18

Product Name Total Chlorine Buffer Solution



Product Code(s) 2263511 Issue Date 17-Apr-2018

Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 3.2 Page 13/18

Aquatic toxicity

FishNo data availableCrustaceaNo data availableAlgaeNo data available

Ingredient Ecological Data

Aquatic toxicity

Fish		If a	vailable, see i	ngredient data l	pelow
Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Sodium hydroxide (1 - 5%) CAS#: 1310-73-2	96 hours	Oncorhynchus mykiss	LC50	45.4 mg/L	IUCLID (The International Uniform Chemical Information Database)
Decyl phenoxybenzenedisul fonic acid, disodium salt (<1%) CAS#: 36445-71-3	96 hours	None reported	LC50	3 mg/L	No information available
Sodium sulfite (<0.1%) CAS#: 7757-83-7	96 hours	Leuciscus idus	LC50	170 mg/L	OECD (Organization for Economic Co-operation and Development)
Crustacea		lf a	vailable see i	ngredient data l	pelow

Crustacea II avaliable, see ingredient data be					DEIOW
Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Sodium hydroxide (1 - 5%) CAS#: 1310-73-2	48 Hours	Daphnia sp.	EC50	40.4 mg/L	IUCLID (The International Uniform Chemical Information Database)
Sodium sulfite (<0.1%) CAS#: 7757-83-7	48 Hours	Daphnia magna	EC50	18 mg/L	OECD (Organization for Economic Co-operation and Development)

Algae		If available, see ingredient data below				
Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data	
Sodium sulfite (<0.1%) CAS#: 7757-83-7	None reported	Chlamydomonas reinhardtii	EC50	63 mg/L	OECD (Organization for Economic Co-operation and Development)	

Other Information

Persistence and degradability

Product Biodegradability Data No data available.

Ingredient Biodegradability Data

Chemical name	Test method	Biodegradation	Exposure time	Results
Potassium iodide (KI) (5 - 10%) CAS#: 7681-11-0	Inorganic Salt	None reported	None reported	Not readily biodegradable
Sodium hydroxide (1 - 5%) CAS#: 1310-73-2	None reported	None reported	None reported	Readily biodegradable

EN / AGHS Page 13/18



Product Code(s) 2263511 Issue Date 17-Apr-2018

Version 3.2

Product Name Total Chlorine Buffer Solution

Revision Date 17-Apr-2018

Page 14/18

Bioaccumulation

Product Bioaccumulation Data

No data available.

Partition Coefficient (n-octanol/water) Not applicable

Ingredient Bioaccumulation Data

Chemical name	Test method	Exposure time	Species	Bioconcentrat ion factor (BCF)	Results
Potassium iodide (KI) (5 - 10%) CAS#: 7681-11-0	None reported	None reported	None reported	None reported	Not determined

Mobility

Soil Organic Carbon-Water Partition Coefficient

Not applicable

Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Other adverse effects

Contains a substance with an endocrine-disrupting potential.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused

products

Dispose of in accordance with local regulations. Dispose of waste in accordance with

environmental legislation.

Contaminated packaging

Do not reuse empty containers.

US EPA Waste Number

D002

Special instructions for disposal

Work in an approved fume hood. Dilute to 3 to 5 times the volume with cold water. Adjust to a pH between 6 and 9 with an acid, such as sulfuric or citric. Open cold water tap completely, slowly pour the reacted material to the drain. Allow cold water to run for 5

minutes to completely flush the system.

14. TRANSPORT INFORMATION

U.S. DOT

UN/ID no UN1824

Proper shipping name Sodium Hydroxide Solution

Hazard Class 8 **Packing Group** Ш **Emergency Response Guide** 154

Number

TDG

EN / AGHS Page 14/18

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application

E-114 of 208



Product Code(s) 2263511 Product Name Total Chlorine Buffer Solution

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 3.2 Page 15/18

UN/ID no UN1824

Proper shipping name Sodium Hydroxide Solution

Hazard Class 8
Packing Group

IATA

UN/ID no UN1824

Proper shipping name Sodium Hydroxide Solution

Hazard Class 8
Packing Group II
ERG Code 154

IMDG

UN/ID no UN1824

Proper shipping name Sodium Hydroxide Solution

Hazard Class 8
Packing Group ||

Note: No special precautions necessary.

Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is not in a reagent set or kit, the classification given above applies.

if the item is not in a reagent set of kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories

TSCA Complies DSL/NDSL Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EINECS/ELINCS Complies **ENCS** Does not comply **IECSC** Complies **KECL** Complies Complies **PICCS TCSI** Complies **AICS** Complies NZIoC Does not comply

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substances Inventory

AICS - Australian Inventory of Chemical Substances

NZIOC - New Zealand Inventory of Chemicals

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

EN / AGHS Page 15/18



Product Code(s) 2263511 Product Name Total Chlorine Buffer Solution

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 3.2 Page 16/18

SARA 311/312 Hazard Categories

Acute health hazard Yes
Chronic Health Hazard Yes
Fire hazard No
Sudden release of pressure hazard No
Reactive Hazard No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sodium hydroxide 1310-73-2	1000 lb	÷-	-	Х

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

Chemical name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Sodium hydroxide	1000 lb	(=)	RQ 1000 lb final RQ
1310-73-2			RQ 454 kg final RQ

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Sodium hydroxide 1310-73-2	Х	Х	Х

U.S. EPA Label Information

Chemical name	FIFRA	FDA
Potassium iodide (KI)	180.0940	21 CFR 184.1634
Sodium hydroxide	180.0910	21 CFR 184.1763
Decyl phenoxybenzenedisulfonic acid, disodium	180.0910	
salt		
Tetrasodium EDTA	180.0910	¥
Benzenesulfonic acid, oxybis[decyl-, disodium	180.0910	-
salt		
Sodium sulfite	180.0910	21 CFR 182.3798

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

EN / AGHS	Page 16/18



Product Code(s) 2263511 Issue Date 17-Apr-2018

Version 3.2

Product Name Total Chlorine Buffer Solution

Revision Date 17-Apr-2018

Page 17 / 18

Special Comments

None

Additional information

Global Automotive Declarable Substance List (GADSL)

Chemical name	Global Automotive Declarable Substance List Classifications	Global Automotive Declarable Substance List Thersholds
Sodium sulfite 7757-83-7	Prohibited Substance (LR) Declarable Substance (LR)	0.0 %

NFPA and HMIS Classifications

NFPA	Health hazards - 3	Flammability - 0	Instability - 0	Physical and Chemical Properties -
HMIS	Health hazards - 3	Flammability - 0	Physical Hazards - 0	Personal protection - X
		0.000	45	- See section 8 for more
				information

Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH Immediately Dangerous to Life or Health

ACGIH (American Conference of Governmental Industrial Hygienists)

NDF no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)

MAC Maximum Allowable Concentration Ceiling Ceiling Limit Value

X Listed Vacated These values have no official status. The only

binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state

regulations.

SKN*Skin designationSKN+Skin sensitizationRSP+Respiratory sensitization**Hazard DesignationCCarcinogenRReproductive toxicant

M mutagen

Prepared By Hach Product Compliance Department

 Issue Date
 17-Apr-2018

 Revision Date
 17-Apr-2018

Revision Note None

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

EN / AGHS Page 17/18



Product Name Total Chlorine Buffer Solution Revision Date 17-Apr-2018 Page 18 / 18

HACH COMPANY©2018

End of Safety Data Sheet

EN / AGHS Page 18/18



HACH 2297255





SAFETY DATA SHEET

Issue Date 12-Oct-2016 Revision Date 17-Apr-2018 Version 4.4 Page 1 / 14

1. IDENTIFICATION

Product identifier

Product Name DPD Compound for Free and Total Chlorine Analyzers

Other means of identification

 Product Code(s)
 2297255

 Safety data sheet number
 M01127

Recommended use of the chemical and restrictions on use

Recommended Use Restricted to professional users.

Uses advised against Consumer use

Restrictions on use For Laboratory Use Only.

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

Emergency telephone number

+1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity - Oral	Category 4
Skin corrosion/irritation	Category 1
Serious eye damage/eye irritation	Category 1
Chronic aquatic toxicity	Category 3

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Signal word - Danger



EN / AGHS Page 1/14



Product Code(s) 2297255

Issue Date 12-Oct-2016

Product Name DPD Compound for Free and Total Chlorine

Analyzers

Revision Date 17-Apr-2018

Page 2/14

Hazard statements

Version 4.4

H302 - Harmful if swallowed

H314 - Causes severe skin burns and eye damage

H412 - Harmful to aquatic life with long lasting effects

Precautionary statements

P270 - Do not eat, drink or smoke when using this product

P501 - Dispose of contents/ container to an approved waste disposal plant

P260 - Do not breathe dust/fume/gas/mist/vapors/spray

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting

P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower

P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P310 - Immediately call a POISON CENTER or doctor/physician

P363 - Wash contaminated clothing before reuse

P405 - Store locked up

P273 - Avoid release to the environment

Other Hazards Known

Harmful to aquatic life

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Chemical FamilyConfidential.Chemical natureConfidential.

Percent ranges are used where confidential product information is applicable.

Chemical name	CAS No.	Percent Range	HMRIC#
Salt of N,N-Diethyl-p-Phenylenediamine	=	100%	~

EN / AGHS Page 2/14



Analyzers

Issue Date 12-Oct-2016 Revision Date 17-Apr-2018

Version 4.4 Page 3/14

4. FIRST AID MEASURES

Description of first aid measures

General advice Show this safety data sheet to the doctor in attendance. Immediate medical attention is

required.

Inhalation Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical

attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. Get immediate medical

advice/attention.

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep

eye wide open while rinsing. Do not rub affected area. Remove contact lenses, if present

and easy to do. Continue rinsing. Get immediate medical advice/attention.

Skin contact Wash off immediately with soap and plenty of water while removing all contaminated

clothes and shoes. Get immediate medical advice/attention.

Ingestion Do NOT induce vomiting. Clean mouth with water and drink afterwards plenty of water.

Never give anything by mouth to an unconscious person. Get immediate medical

advice/attention.

Self-protection of the first aider Ensure that medical personnel are aware of the material(s) involved, take precautions to

protect themselves and prevent spread of contamination. Avoid contact with skin, eyes or clothing. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation.

Most important symptoms and effects, both acute and delayed

Symptoms Burning sensation.

Indication of any immediate medical attention and special treatment needed

Note to physicians Product is a corrosive material. Use of gastric lavage or emesis is contraindicated.

Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood

pressure may occur with moist rales, frothy sputum, and high pulse pressure.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media Use extinguishing measures that are appropriate to local circumstances and the

surrounding environment.

Unsuitable Extinguishing Media Caution: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the

chemical

The product causes burns of eyes, skin and mucous membranes. Thermal decomposition

can lead to release of irritating gases and vapors.

Hazardous combustion products Carbon dioxide (CO2). Carbon monoxide

Special protective equipment for

fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout

gear.

6. ACCIDENTAL RELEASE MEASURES

EN / AGHS Page 3/14



Analyzers

Issue Date 12-Oct-2016 Revision Date 17-Apr-2018

Version 4.4 Page 4/14

U.S. Notice Only persons properly qualified to respond to an emergency involving hazardous

substances may respond to a spill according to federal regulations (OSHA 29 CFR

1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Outside of the US, only persons properly qualified according to state or local regulations

should respond to a spill involving chemicals.

Personal precautions, protective equipment and emergency procedures

Personal precautions Attention! Corrosive material. Avoid contact with skin, eyes or clothing. Ensure adequate

ventilation. Use personal protective equipment as required. Evacuate personnel to safe

areas. Keep people away from and upwind of spill/leak.

Other Information Refer to protective measures listed in Sections 7 and 8.

Environmental precautions

Environmental precautions Prevent further leakage or spillage if safe to do so. Should not be released into the

environment. Do not allow to enter into soil/subsoil. Prevent product from entering drains.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Pick up and transfer to properly labeled containers.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

Reference to other sections See section 8 for more information. See section 13 for more information.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with

skin, eyes or clothing. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation. Do not eat, drink or smoke when using this product. Take off contaminated

clothing and wash before reuse.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Keep out of the reach

of children. Protect from moisture. Store locked up. Store away from other materials.

Flammability class Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines This product, as supplied, does not contain any hazardous materials with occupational

exposure limits established by the region specific regulatory bodies

Appropriate engineering controls

Engineering Controls Showers

EN / AGHS Page 4/14



Analyzers

Issue Date 12-Oct-2016 Revision Date 17-Apr-2018

Version 4.4 Page 5/14

> Eyewash stations Ventilation systems.

Individual protection measures, such as personal protective equipment

No protective equipment is needed under normal use conditions. If exposure limits are Respiratory protection

exceeded or irritation is experienced, ventilation and evacuation may be required.

Hand Protection Wear suitable gloves. Impervious gloves.

Eye/face protection Face protection shield.

Skin and body protection Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron.

Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Do **General Hygiene Considerations**

not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product.

Environmental exposure controls Local authorities should be advised if significant spillages cannot be contained. Do not

allow into any sewer, on the ground or into any body of water.

Thermal hazards None under normal processing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state

Solid

powder white **Appearance** Color Odor None Odor threshold

Not applicable

Property Values Remarks • Method

164.24 g/mole Molecular weight

рΗ 5% Solution

180 °C / 356 °F Melting point/freezing point Boiling point / boiling range No data available Evaporation rate Not applicable Vapor pressure Not applicable Vapor density (air = 1) Not applicable

Specific gravity (water = 1 / air = 1) 1.226

Partition Coefficient (n-octanol/water) Partition coefficient Soil Organic Carbon-Water Partition

Coefficient

No data available

Autoignition temperature No data available No data available Decomposition temperature Dynamic viscosity Not applicable

EN / AGHS Page 5/14



Analyzers

Issue Date 12-Oct-2016 Revision Date 17-Apr-2018

Version 4.4 Page 6/14

Kinematic viscosity Not applicable

Solubility(ies)

Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Completely soluble	> 10000 mg/L	25 °C / 77 °F

Solubility in other solvents

Chemical Name	Solubility classification	<u>Solubility</u>	Solubility Temperature
None reported	No information available	No data available	No information available

Other Information

Metal Corrosivity

 Steel Corrosion Rate
 Not applicable

 Aluminum Corrosion Rate
 Not applicable

Volatile Organic Compounds (VOC) Content

This Product is by Weight 100% an Individual Pure Chemical Substance

Chemical name	CAS No.	Volatile organic compounds (VOC) content	CAA (Clean Air Act)
Salt of	1.T.	Not applicable	=
N,N-Diethyl-p-Phenylenediamine		60 57	

Explosive properties

Upper explosion limit No data available Lower explosion limit No data available

Flammable properties

Flash point Not applicable

Flammability Limit in Air

Upper flammability limit:
Lower flammability limit:
No data available
No data available

Oxidizing properties
No data available.

Bulk density
No data available

Particle Size No information available

Particle Size Distribution No information available

10. STABILITY AND REACTIVITY

Reactivity
Not applicable.

Chemical stability

Stability Stable under normal conditions.

EN / AGHS Page 6/14



Analyzers

Revision Date 17-Apr-2018

Version 4.4 Page 7/14

Explosion data

Issue Date 12-Oct-2016

Sensitivity to Mechanical Impact None Sensitivity to Static Discharge None.

Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing.

Hazardous polymerization

Hazardous polymerization does not occur.

Conditions to avoid

Conditions to avoid Exposure to air or moisture over prolonged periods.

Incompatible materials

Incompatible materials Acids. Bases. Oxidizing agent.

Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information

Inhalation Corrosive by inhalation. Inhalation of corrosive fumes/gases may cause coughing, choking,

headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs.

Pulmonary edema can be fatal.

Eye contact Causes burns. Corrosive to the eyes and may cause severe damage including blindness.

Causes serious eye damage. May cause irreversible damage to eyes.

Skin contact May cause irritation.

Ingestion Causes burns. Ingestion causes burns of the upper digestive and respiratory tracts. May

cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung

damage if swallowed. May be fatal if swallowed and enters airways.

Symptoms Redness. Burning. May cause blindness. Coughing and/ or wheezing.

Aggravated Medical Conditions Eye disorders.

Toxicologically synergistic None known.

products

Toxicokinetics, metabolism and This Product is by Weight 100% an Individual Pure Chemical Substance.

distribution

Product Acute Toxicity Data This Product is by Weight 100% an Individual Pure Chemical

Substance

Oral Exposure Route
Dermal Exposure Route
If available, see ingredient data below
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
If available, see ingredient data below
Inhalation (Gas) Exposure Route
If available, see ingredient data below
Inhalation (Gas) Exposure Route
If available, see ingredient data below

Unknown Acute Toxicity

EN / AGHS Page 7/14



Analyzers

Issue Date 12-Oct-2016 Revision Date 17-Apr-2018

Version 4.4 Page 8/14

0% of the mixture consists of ingredient(s) of unknown toxicity.

Acute Toxicity Estimations (ATE)

Not applicable

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)	No information available
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	No information available
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

Ingredient Acute Toxicity Data

Oral Exposure Route			4	If available, see data below	
Chemical name	Endpoint	Reported	Exposure	Toxicological effects	Key literature references and
	type	dose	time	8000	sources for data
Salt of	Rat	695 mg/kg	None	None reported	Outside testing
N,N-Diethyl-p-Phenyl	LD ₅₀		reported		
enediamine			100		
(100%)					
CAS#: -					

Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route
Dermal Exposure Route
If available, see ingredient data below
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
If available, see ingredient data below
Inhalation (Gas) Exposure Route
If available, see ingredient data below
Inhalation (Gas) Exposure Route
If available, see ingredient data below

Ingredient Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Aspiration toxicity

If available, see data below

Kinematic viscosity Not applicable

Product Skin Corrosion/Irritation Data

This Product is by Weight 100% an Individual Pure Chemical Substance. If available, see ingredient data below.

Ingredient Skin Corrosion/Irritation Data

If available, see data below

Product Serious Eye Damage/Eye Irritation Data

This Product is by Weight 100% an Individual Pure Chemical Substance. If available, see ingredient data below.

Ingredient Eye Damage/Eye Irritation Data

No data available

Sensitization Information

Product Sensitization Data

Skin Sensitization Exposure Route This Product is by Weight 100% an Individual Pure Chemical

EN / AGHS Page 8/14



Analyzers

Issue Date 12-Oct-2016 Revision Date 17-Apr-2018 Page 9/14

Version 4.4

Substance. If available, see ingredient data below.

This Product is by Weight 100% an Individual Pure Chemical Respiratory Sensitization Exposure Route

Substance. If available, see ingredient data below.

Ingredient Sensitization Data

Skin Sensitization Exposure Route If available, see data below. Respiratory Sensitization Exposure Route If available, see data below.

Chronic Toxicity Information

Product Specific Target Organ Toxicity Repeat Dose Data

Oral Exposure Route If available, see ingredient data below. **Dermal Exposure Route** If available, see ingredient data below. Inhalation (Dust/Mist) Exposure Route If available, see ingredient data below. If available, see ingredient data below. Inhalation (Vapor) Exposure Route Inhalation (Gas) Exposure Route If available, see ingredient data below.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

If available, see data below **Oral Exposure Route Dermal Exposure Route** If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below If available, see data below Inhalation (Gas) Exposure Route

Product Carcinogenicity Data

Oral Exposure Route If available, see ingredient data below **Dermal Exposure Route** If available, see ingredient data below Inhalation (Dust/Mist) Exposure Route If available, see ingredient data below Inhalation (Vapor) Exposure Route If available, see ingredient data below Inhalation (Gas) Exposure Route If available, see ingredient data below

Ingredient Carcinogenicity Data

Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
Salt of	121	<u>-</u>	=	=	72
N,N-Diethyl-p-Phenylenedi					
amine					

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply
NTP (National Toxicology Program)	Does not apply
OSHA (Occupational Safety and Health Administration of the US Department of	Does not apply
Labor)	900v III.

If available, see data below **Oral Exposure Route Dermal Exposure Route** If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below If available, see data below Inhalation (Vapor) Exposure Route Inhalation (Gas) Exposure Route If available, see data below

Product Germ Cell Mutagenicity invitro Data

This Product is by Weight 100% an Individual Pure Chemical Substance. If available, see ingredient data below.

Ingredient Germ Cell Mutagenicity invitro Data

No data available

Product Germ Cell Mutagenicity invivo Data

Oral Exposure Route If available, see ingredient data below **Dermal Exposure Route** If available, see ingredient data below

Page 9/14 EN / AGHS



Analyzers

Issue Date 12-Oct-2016 Revision Date 17-Apr-2018

Version 4.4 Page 10/14

Inhalation (Dust/Mist) Exposure Route If available, see ingredient data below Inhalation (Vapor) Exposure Route If available, see ingredient data below Inhalation (Gas) Exposure Route If available, see ingredient data below

Ingredient Germ Cell Mutagenicity invivo Data

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route Inhalation (Vapor) Exposure Route If available, see data below If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Reproductive Toxicity Data

If available, see ingredient data below Oral Exposure Route **Dermal Exposure Route** If available, see ingredient data below Inhalation (Dust/Mist) Exposure Route If available, see ingredient data below Inhalation (Vapor) Exposure Route If available, see ingredient data below Inhalation (Gas) Exposure Route If available, see ingredient data below

Ingredient Reproductive Toxicity Data Oral Exposure Route

If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

12. ECOLOGICAL INFORMATION

Harmful to aquatic life with long lasting effects **Ecotoxicity**

Product Ecological Data This Product is by Weight 100% an Individual Pure Chemical

Substance

Aquatic toxicity

If available, see ingredient data below Fish Crustacea If available, see ingredient data below Algae If available, see ingredient data below

Ingredient Ecological Data

Aquatic toxicity

Fish No data available

Crustacea If available, see ingredient data below

Chemical n	ame	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Salt of N,N-Diethyl-p- enediami (100%) CAS#:	ne	48 Hours	Daphina magna	EC50	10.8 mg/L	Internal Data

No data available Algae

Other Information

Persistence and degradability

Product Biodegradability Data

This Product is by Weight 100% an Individual Pure Chemical Substance.

Ingredient Biodegradability Data

EN / AGHS Page 10/14



Product Code(s) 2297255

Issue Date 12-Oct-2016

Version 4.4

Product Name DPD Compound for Free and Total Chlorine

Analyzers

Revision Date 17-Apr-2018

Page 11 / 14

Chemical name	Test method	Biodegradation	Exposure time	Results
Salt of N,N-Diethyl-p-Phenyl enediamine (100%) CAS#: -	None reported	None reported	None reported	Not determined

Bioaccumulation

Product Bioaccumulation Data

This Product is by Weight 100% an Individual Pure Chemical Substance.

Partition Coefficient (n-octanol/water)

Partition coefficient

Ingredient Bioaccumulation Data

Chemical name	Test method	Exposure time	Species	Bioconcentrat ion factor (BCF)	Results
Salt of N,N-Diethyl-p-Phenyl enediamine (100%) CAS#: -	None reported	None reported	None reported	None reported	Not determined

Mobility

Soil Organic Carbon-Water Partition Coefficient

No data available

Water solubility

Water so	lubility classification	Water solubility	Water Solubility Temperature
Coi	mpletely soluble	> 10000 mg/L	25 °C / 77 °F

Other adverse effects

No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused products

Dispose of in accordance with local regulations. Dispose of waste in accordance with

environmental legislation.

Contaminated packaging Do not reuse empty containers.

US EPA Waste Number Not applicable, D002

14. TRANSPORT INFORMATION					
U.S. DOT	Not regulated				
EN / AGHS		Page 11 / 14			



Analyzers

Issue Date 12-Oct-2016 Revision Date 17-Apr-2018

Version 4.4 Page 12/14

 IATA
 Not regulated

 IMDG
 Not regulated

 Not regulated

 Not regulated

Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods.

If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories

TSCA Complies DSL/NDSL Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EINECS/ELINCS Complies **ENCS** Complies **IECSC** Complies Complies **KECL** Complies **PICCS TCSI** Complies **AICS** Complies NZIoC Complies

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substances Inventory

AICS - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

Acute health hazard Yes
Chronic Health Hazard Yes
Fire hazard No
Sudden release of pressure hazard No
Reactive Hazard No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

EN / AGHS Page 12/14



Analyzers

Revision Date 17-Apr-2018

Page 13/14

CERCLA

Version 4.4

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

US State Regulations

Issue Date 12-Oct-2016

California Proposition 65

This product does not contain any Proposition 65 chemicals

IMERC: Not applicable

U.S. State Right-to-Know Regulations

U.S. EPA Label Information

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Special Comments

None

Additional information

Global Automotive Declarable Substance List (GADSL)

Not applicable

NFPA and HMIS Classifications

NFPA	Health hazards - 2	Flammability - 0	Instability - 0	Physical and Chemical Properties -
HMIS	Health hazards - 1	Flammability - 0	Physical Hazards - 0	Personal protection - X - See section 8 for more information

Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH Immediately Dangerous to Life or Health

ACGIH (American Conference of Governmental Industrial Hygienists)

NDF no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)

MAC Maximum Allowable Concentration Ceiling Ceiling Limit Value

X Listed Vacated These values have no official status. The only

binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that

EN / AGHS Page 13/14



Analyzers

Issue Date 12-Oct-2016 Revision Date 17-Apr-2018

Version 4.4 Page 14/14

some reference state regulations of these "liberated" exposure limits in their state

regulations.

SKN* Skin designation SKN+ Skin sensitization
RSP+ Respiratory sensitization ** Hazard Designation
C Carcinogen R Reproductive toxicant

M mutagen

Prepared By Hach Product Compliance Department

 Issue Date
 12-Oct-2016

 Revision Date
 17-Apr-2018

Revision Note SDS sections updated

2

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY©2018

End of Safety Data Sheet

EN / AGHS Page 14/14



HACH 2314011





SAFETY DATA SHEET

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018 Version 2.5 Page 1 / 15

1. IDENTIFICATION

Product identifier

Product Name Free Chlorine Indicator Solution for CL-17 Analyzer

Other means of identification

 Product Code(s)
 2314011

 Safety data sheet number
 M00598

 UN/ID no
 UN2586

Recommended use of the chemical and restrictions on use

Recommended Use Laboratory reagent. Determination of Free Chlorine.

Uses advised against None. Restrictions on use None.

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

Emergency telephone number

+1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Corrosive to metals	Category 1
Skin corrosion/irritation	Category 1
Serious eve damage/eve irritation	Category 1

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Signal word - Danger

EN / AGHS Page 1/15



Product Code(s) 2314011

Issue Date 17-Apr-2018 Version 2.5

Product Name Free Chlorine Indicator Solution for CL-17 Analyzer Revision Date 17-Apr-2018

Page 2/15



Hazard statements

H290 - May be corrosive to metals

H314 - Causes severe skin burns and eye damage

Precautionary statements

P260 - Do not breathe dust/fume/gas/mist/vapors/spray

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting
P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower

P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P310 - Immediately call a POISON CENTER or doctor/physician

P363 - Wash contáminated clothing before reuse

P405 - Store locked up

P501 - Dispose of contents/ container to an approved waste disposal plant

P234 - Keep only in original container

P390 - Absorb spillage to prevent material damage

Other Hazards Known

May be harmful if swallowed

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable

Mixture

Percent ranges are used where confidential product information is applicable.

	Chemical name	CAS No.	Percent Range	HMRIC #	
Tol	uene, 4-sulfonic acid, monohydrate	6192-52-5	5-10%	. 4	

EN / AGHS Page 2/15



Analyzer

Revision Date 17-Apr-2018 Issue Date 17-Apr-2018 Version 2.5

Page 3/15

4. FIRST AID MEASURES

Description of first aid measures

Show this safety data sheet to the doctor in attendance. Immediate medical attention is General advice

Inhalation Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical

attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. Get immediate medical

advice/attention

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Remove contact lenses, if present and easy to do. Continue rinsing. Keep eye wide open

while rinsing. Do not rub affected area. Get immediate medical advice/attention.

Skin contact Wash off immediately with soap and plenty of water while removing all contaminated

clothes and shoes. Get immediate medical advice/attention.

Ingestion Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth

to an unconscious person. Do NOT induce vomiting. Get immediate medical

advice/attention.

Avoid contact with skin, eyes or clothing. Ensure that medical personnel are aware of the Self-protection of the first aider

material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid direct contact with skin. Use barrier to give mouth-to-mouth

resuscitation.

Most important symptoms and effects, both acute and delayed

Symptoms 5 4 1 Burning sensation.

Indication of any immediate medical attention and special treatment needed

Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Note to physicians

Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood

pressure may occur with moist rales, frothy sputum, and high pulse pressure.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media Use extinguishing measures that are appropriate to local circumstances and the

surrounding environment

Unsuitable Extinguishing Media Caution: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the chemical

The product causes burns of eyes, skin and mucous membranes. Thermal decomposition

can lead to release of irritating gases and vapors.

Hazardous combustion products This material will not burn.

Special protective equipment for

fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout

6. ACCIDENTAL RELEASE MEASURES

EN / AGHS Page 3/15



Analyzer

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.5 Page 4/15

U.S. Notice Only persons properly qualified to respond to an emergency involving hazardous

substances may respond to a spill according to federal regulations (OSHA 29 CFR

1910.120(a)(v)) and per your company's emergency response plan and

guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations

should respond to a spill involving chemicals.

Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal

protective equipment as required. Attention! Corrosive material. Evacuate personnel to

safe areas. Keep people away from and upwind of spill/leak.

Other Information Refer to protective measures listed in Sections 7 and 8.

Environmental precautions

Environmental precautions Prevent further leakage or spillage if safe to do so. Should not be released into the

environment. Do not allow to enter into soil/subsoil. Prevent product from entering drains.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Pick up and transfer to properly labeled containers.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

Reference to other sections See section 8 for more information. See section 13 for more information.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with

skin, eyes or clothing. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation. Do not eat, drink or smoke when using this product. Take off contaminated

clothing and wash before reuse.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from

moisture. Store locked up. Keep out of the reach of children. Store away from other

materials.

Flammability class Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines This product, as supplied, does not contain any hazardous materials with occupational

exposure limits established by the region specific regulatory bodies

EN / AGHS Page 4/15



Analyzer

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.5 Page 5/15

Appropriate engineering controls

Engineering Controls Showers

Eyewash stations Ventilation systems.

Individual protection measures, such as personal protective equipment

Respiratory protection No protective equipment is needed under normal use conditions. If exposure limits are

exceeded or irritation is experienced, ventilation and evacuation may be required.

Hand Protection Wear suitable gloves. Impervious gloves.

Eyelface protection Face protection shield.

Skin and body protection Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron.

General Hygiene Considerations Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this

product. Regular cleaning of equipment, work area and clothing is recommended. Avoid contact with skin, eyes or clothing. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Contaminated work clothing should not be allowed out of the workplace. Wash hands before breaks and immediately after handling the product.

Environmental exposure controls Local authorities should be advised if significant spillages cannot be contained. Do not

allow into any sewer, on the ground or into any body of water.

Thermal hazards None under normal processing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state Liquid

Appearance aqueous solution Color colorless

Odor Irritating Odor threshold No data available

Property Values Remarks • Method

Molecular weight No data available

pH 0.34

Melting point/freezing point $\,$ -3 $\,^{\circ}\text{C}$ / 27 $\,^{\circ}\text{F}$

Boiling point / boiling range ~ 101 °C / 214 °F Estimation based on theoretical

calculation

Evaporation rate 0.8 (water = 1)

Vapor pressure 17.327 mm Hg / 2.31 kPa at 20 °C / 68 °F Estimation based on theoretical

calculation

Vapor density (air = 1) 0.62

Specific gravity (water = 1 / air = 1) 1.027

Partition Coefficient (n-octanol/water)

Soil Organic Carbon-Water Partition

Coefficient

Not applicable

Autoignition temperature No data available

EN / AGHS Page 5/15



Analyzer

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018 Version 2.5

Page 6/15

Decomposition temperature No data available

Dynamic viscosity ~ 1.5 cP (mPa s) at 20 °C / 68 °F Kinematic viscosity ~ 1.461 cSt (mm2/s) at 20 °C / 68 °F

Solubility(ies)

Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 ℃ / 77 °F

Solubility in other solvents

Chemical Name Solubility classification		<u>Solubility</u>	Solubility Temperature
Acid Soluble		> 1000 mg/L	25 °C / 77 °F
Aqueous alkaline solutions	Soluble	> 1000 mg/L	25 °C / 77 °F
Ethyl alcohol	Soluble	> 1000 mg/L	25 °C / 77 °F
Ether	Soluble	> 1000 mg/L	25 °C / 77 °F

Other Information

Metal Corrosivity

Classified as corrosive to metal according to GHS criteria

Steel Corrosion Rate **Aluminum Corrosion Rate** 52.07 mm/yr / 2.05 in/yr

Volatile Organic Compounds (VOC) Content

Chemical name	CAS No.	Volatile organic compounds (VOC) content	CAA (Clean Air Act)
Toluene, 4-sulfonic acid, monohydrate	6192-52-5	Not applicable	

Explosive properties

Upper explosion limit No data available Lower explosion limit No data available

Flammable properties

Flash point No data available

Flammability Limit in Air

Upper flammability limit: No data available Lower flammability limit: No data available

Oxidizing properties No data available.

Bulk density Not applicable

Particle Size No information available Particle Size Distribution No information available

Page 6/15 EN / AGHS



Analyzer

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.5 Page 7/15

10. STABILITY AND REACTIVITY

Reactivity

Not applicable.

Chemical stability

Stability Stable under normal conditions

Explosion data

Sensitivity to Mechanical Impact None Sensitivity to Static Discharge None.

Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing

Hazardous polymerization

None under normal processing.

Conditions to avoid

Conditions to avoid Exposure to air or moisture over prolonged periods.

Incompatible materials

Incompatible materials Oxidizing agent. Acids. Bases.

Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information

Corrosive by inhalation. Inhalation of corrosive fumes/gases may cause coughing, choking, Inhalation

headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs.

Pulmonary edema can be fatal.

Eye contact Causes burns. Corrosive to the eyes and may cause severe damage including blindness.

Causes serious eye damage. May cause irreversible damage to eyes.

Skin contact May cause irritation.

Causes burns. Ingestion causes burns of the upper digestive and respiratory tracts. May Ingestion

cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung

damage if swallowed. May be fatal if swallowed and enters airways.

Redness. Burning. May cause blindness. Coughing and/ or wheezing Symptoms 5 4 1

Aggravated Medical Conditions Eye disorders. Skin disorders. Respiratory disorders.

Toxicologically synergistic

None known.

products

Toxicokinetics, metabolism and See ingredients information below.

distribution

Product Acute Toxicity Data

Oral Exposure Route No data available

EN / AGHS Page 7/15



Analyzer

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.5 Page 8/15

Dermal Exposure RouteNo data availableInhalation (Dust/Mist) Exposure RouteNo data availableInhalation (Vapor) Exposure RouteNo data availableInhalation (Gas) Exposure RouteNo data available

Unknown Acute Toxicity

0.01% of the mixture consists of ingredient(s) of unknown toxicity.

Acute Toxicity Estimations (ATE)

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)	4,073.00 mg/kg
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	No information available
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

Ingredient Acute Toxicity Data

Oral Exposure Route				If available, see data below		
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data	
Toluene, 4-sulfonic acid, monohydrate (5 - 10%) CAS#: 6192-52-5	Rat	400 mg/kg	None reported	None reported	HSDB (Hazardous Substances Data Bank)	
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data	
Toluene, 4-sulfonic acid, monohydrate (5 - 10%)	Mouse	735 mg/kg	None reported	None reported	HSDB (Hazardous Substances Data Bank)	

Dermal Exposure Ro	ute			If available, see data below	
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Toluene, 4-sulfonic acid, monohydrate (5 - 10%) CAS#: 6192-52-5	Rabbit	> 2000 mg/kg	None reported	None reported	No information available

Inhalation (Dust/Mist) Exposure Route If available, see data below							
Endpoint	Reported	Exposure	Toxicological effects	Key literature references and			
type	dose	time		sources for data			
Rat	> 25 mg/L	None	None reported	No information available			
LC50	===	reported	·				
	Endpoint type Rat	Endpoint type Reported dose Rat > 25 mg/L	Endpoint type Reported dose Exposure time Rat > 25 mg/L None	Endpoint type Reported dose Exposure time Toxicological effects Rat > 25 mg/L None None reported			

Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Specific Target Organ Toxicity Single Exposure Data

Oral Exposure RouteNo data availableDermal Exposure RouteNo data availableInhalation (Dust/Mist) Exposure RouteNo data availableInhalation (Vapor) Exposure RouteNo data availableInhalation (Gas) Exposure RouteNo data available

Ingredient Specific Target Organ Toxicity Single Exposure Data

 Oral Exposure Route
 If available, see data below

 Dermal Exposure Route
 If available, see data below

EN / AGHS Page 8/15



Analyzer

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.5 Page 9/15

 Inhalation (Dust/Mist) Exposure Route
 If available, see data below

 Inhalation (Vapor) Exposure Route
 If available, see data below

 Inhalation (Gas) Exposure Route
 If available, see data below

Aspiration toxicity
If available, see data below
Kinematic viscosity

~ 1.461 cSt (mm²/s)

Product Skin Corrosion/Irritation Data

No data available.

Ingredient Skin Corrosion/Irritation Data

If available, see data below

Product Serious Eye Damage/Eye Irritation Data

No data available.

Ingredient Eye Damage/Eye Irritation Data

No data available

Sensitization Information

Product Sensitization Data

Skin Sensitization Exposure Route
Respiratory Sensitization Exposure Route
No data available.
No data available.

Ingredient Sensitization Data

Skin Sensitization Exposure Route If available, see data below. Respiratory Sensitization Exposure Route If available, see data below.

Chronic Toxicity Information

Product Specific Target Organ Toxicity Repeat Dose Data

 Oral Exposure Route
 No data available.

 Dermal Exposure Route
 No data available.

 Inhalation (Dust/Mist) Exposure Route
 No data available.

 Inhalation (Vapor) Exposure Route
 No data available.

 Inhalation (Gas) Exposure Route
 No data available.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Carcinogenicity Data

 Oral Exposure Route
 No data available

 Dermal Exposure Route
 No data available

 Inhalation (Dust/Mist) Exposure Route
 No data available

 Inhalation (Vapor) Exposure Route
 No data available

 Inhalation (Gas) Exposure Route
 No data available

Ingredient Carcinogenicity Data

Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
Toluene, 4-sulfonic acid,	6192-52-5	-	.=	=	i.=
monohydrate					

Legend

EN / AGHS	Page 9/15



Analyzer

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.5 Page 10/15

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply
NTP (National Toxicology Program)	Does not apply
OSHA (Occupational Safety and Health Administration of the US Department of	Does not apply
Labor)	600 U

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Germ Cell Mutagenicity invitro Data

No data available.

Ingredient Germ Cell Mutagenicity invitro Data

No data available

Product Germ Cell Mutagenicity invivo Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
No data available
No data available
No data available

Ingredient Germ Cell Mutagenicity invivo Data

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Reproductive Toxicity Data

 Oral Exposure Route
 No data available

 Dermal Exposure Route
 No data available

 Inhalation (Dust/Mist) Exposure Route
 No data available

 Inhalation (Vapor) Exposure Route
 No data available

 Inhalation (Gas) Exposure Route
 No data available

Ingredient Reproductive Toxicity Data

Oral Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

12. ECOLOGICAL INFORMATION

Ecotoxicity Not considered to be harmful to aquatic life

Product Ecological Data

Aquatic toxicity

Fish No data available Crustacea No data available Algae No data available

Ingredient Ecological Data

Aquatic toxicity

EN / AGHS Page 10 / 15



Product Code(s) 2314011 Issue Date 17-Apr-2018 Product Name Free Chlorine Indicator Solution for CL-17

Analyzer

Revision Date 17-Apr-2018

Page 11 / 15

Version 2.5

risn	isn It available, see ingredient data below				pelow
Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Toluene, 4-sulfonic acid, monohydrate (5 - 10%) CAS#: 6192-52-5	96 hours	Oncorhynchus mykiss	LC50	60 mg/L	IPCS INCHEM (International Programme on Chemical Safety)

Crustacea Algae If available, see ingredient data below If available, see ingredient data below

Other Information

Persistence and degradability

Product Biodegradability Data

No data available.

Ingredient Biodegradability Data

	Chemical name	Test method	Biodegradation	Exposure time	Results
a	oluene, 4-sulfonic acid, monohydrate (5 - 10%) CAS#: 6192-52-5	None reported	94%	21 days	Readily biodegradable

Bioaccumulation

Product Bioaccumulation Data

No data available.

Partition Coefficient (n-octanol/water)

Not applicable

Ingredient Bioaccumulation Data

Chemical name	Test method	Exposure time	Species	Bioconcentrat ion factor (BCF)	Results
Toluene, 4-sulfonic acid, monohydrate (5 - 10%) CAS#: 6192-52-5	None reported	None reported	None reported	None reported	Not determined

Mobility

Soil Organic Carbon-Water Partition Coefficient

Not applicable

Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Other adverse effects

No information available.

EN / AGHS Page 11 / 15



Analyzer

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.5 Page 12/15

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused

products

Dispose of in accordance with local regulations. Dispose of waste in accordance with

environmental legislation.

Contaminated packaging Do not reuse empty containers.

US EPA Waste Number D002

Special instructions for disposal Work in an approved fume hood. Dilute material with excess water making a weaker than

5% solution. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. If permitted by regulation. Open cold water tap completely, slowly pour the reacted material to the drain. Allow cold water to run for 5 minutes to completely flush the system. Check with local municipal and state authorities and waste contractors for pertinent

local information regarding the proper disposal of chemicals.

14. TRANSPORT INFORMATION

U.S. DOT

UN/ID no UN2586

Proper shipping name Alkylsulfonic acids, liquid

Hazard Class 8

Packing Group

Description UN2586, Alkyl sulfonic acids, liquid, 8, III

Emergency Response Guide 153

Number

TDG

UN/ID no UN2586

Proper shipping name Arylsulphonic Acid, Liquid

Hazard Class 8
Packing Group

Description UN2586, Alkylsulfonic acids, liquid, 8, III

IATA

UN2586

Proper shipping name Alkylsulphonic acids, liquid

Hazard Class 8
Packing Group III
ERG Code 8L
Special precautions for user A803

Description UN2586, Alkylsulphonic acids, liquid, 8, III

IMDG

UN/ID no UN2586

Proper shipping name
Proper shipping name
Alkylsulphonic acids, liquid
Arylsulphonic Acid, Liquid

 Hazard Class
 8

 Packing Group
 III

 EmS-No
 F-A, S-B

Description UN2586, Alkylsulphonic acids, liquid, 8, III

Note: No special precautions necessary.

Additional information

EN / AGHS Page 12/15



Analyzer

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.5 Page 13/15

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods.

If the item is not in a reagent set or kit, the classification given above applies

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply

15. REGULATORY INFORMATION

National Inventories

TSCA Complies DSL/NDSL Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EINECS/ELINCS Complies Complies **FNCS IECSC** Complies **KECL** Complies **PICCS** Complies **TCSI** Complies AICS Complies NZIoC Complies

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substances Inventory AICS - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

Acute health hazard Yes
Chronic Health Hazard Yes
Fire hazard No
Sudden release of pressure hazard No
Reactive Hazard No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

EN / AGHS Page 13/15



Analyzer

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018 Version 2.5

Page 14/15

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

U.S. EPA Label Information

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Special Comments

None

Additional information

Global Automotive Declarable Substance List (GADSL)

Not applicable

NFPA and HMIS Classifications

NFPA	Health hazards - 3	Flammability - 0	Instability - 0	Physical and Chemical Properties -
HMIS	Health hazards - 3	Flammability - 0	Physical Hazards - 0	Personal protection - X - See section 8 for more information

Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH Immediately Dangerous to Life or Health

ACGIH ACGIH (American Conference of Governmental Industrial Hygienists)

NDF no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)

MAC Maximum Allowable Concentration Ceiling Ceiling Limit Value

Χ Listed Vacated These values have no official status. The only

binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state

regulations.

SKN* Skin designation SKN+ Skin sensitization RSP+ Hazard Designation Respiratory sensitization R C Carcinogen Reproductive toxicant

М mutagen

Hach Product Compliance Department Prepared By

EN / AGHS Page 14/15



Analyzer

Issue Date 17-Apr-2018 Revision Date 17-Apr-2018 Version 2.5

Page 15 / 15

Issue Date 17-Apr-2018 **Revision Date** 17-Apr-2018

Revision Note None

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY@2018

End of Safety Data Sheet

EN / AGHS Page 15/15



HACH 2314111





SAFETY DATA SHEET

1. IDENTIFICATION

Product identifier

Product Name Free Chlorine Buffer for CL-17 Analyzer

Other means of identification

 Product Code(s)
 2314111

 Safety data sheet number
 M00599

Recommended use of the chemical and restrictions on use

Recommended Use Laboratory reagent. Determination of Free Chlorine.

Uses advised against None Restrictions on use None

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

Emergency telephone number

+1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Not a dangerous substance or mixture according to the Globally Harmonized System (GHS)

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Hazard statements

The product contains no substances which at their given concentration, are considered to be hazardous to health

Other Hazards Known

May be harmful if swallowed

3. COMPOSITION/INFORMATION ON INGREDIENTS

EN / AGHS Page 1/12



Product Code(s) 2314111 Issue Date 17-Apr-2018

Version 2.1

Product Name Free Chlorine Buffer for CL-17 Analyzer **Revision Date** 17-Apr-2018

Page 2/12

Substance Not applicable

Mixture

4. FIRST AID MEASURES

Description of first aid measures

General advice No hazards which require special first aid measures. Use first aid treatment according to

the nature of the injury.

Inhalation Remove to fresh air.

Eye contact Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids.

Consult a physician.

Skin contact Wash skin with soap and water.

Ingestion Clean mouth with water and drink afterwards plenty of water.

Most important symptoms and effects, both acute and delayed

Symptoms See Section 11 for additional Toxicological Information.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media Use extinguishing measures that are appropriate to local circumstances and the

surrounding environment.

Unsuitable Extinguishing Media Caution: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the

chemical

No information available.

Hazardous combustion products Carbon monoxide, Carbon dioxide.

Special protective equipment for

fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout

gear.

6. ACCIDENTAL RELEASE MEASURES

U.S. Notice Only persons properly qualified to respond to an emergency involving hazardous

substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines (procedures. See Section 13. Special Instructions for disposal assistance

guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Outside of the US, only persons properly qualified according to state or local regulations

should respond to a spill involving chemicals.

Personal precautions, protective equipment and emergency procedures

Personal precautions Ensure adequate ventilation.

EN / AGHS Page 2/12



Product Code(s) 2314111 Issue Date 17-Apr-2018 Version 2.1 Product Name Free Chlorine Buffer for CL-17 Analyzer

Revision Date 17-Apr-2018

Page 3/12

Environmental precautions

Environmental precautions See Section 12 for additional ecological information.

Methods and material for containment and cleaning up

Methods for containmentPrevent further leakage or spillage if safe to do so.Methods for cleaning upPick up and transfer to properly labeled containers.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

Reference to other sections See section 8 for more information. See section 13 for more information.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place.

Flammability class Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines This product, as supplied, does not contain any hazardous materials with occupational

exposure limits established by the region specific regulatory bodies

Appropriate engineering controls

Engineering Controls Showers

Eyewash stations Ventilation systems.

Individual protection measures, such as personal protective equipment

exceeded or irritation is experienced, ventilation and evacuation may be required.

Hand Protection Wear suitable gloves.

Eye/face protection Wear safety glasses with side shields (or goggles).

Skin and body protection No special protective equipment required.

General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practice.

Environmental exposure controls Local authorities should be advised if significant spillages cannot be contained. Do not

allow into any sewer, on the ground or into any body of water.

Thermal hazards None under normal processing.

EN / AGHS _______ Page 3/12



Product Code(s) 2314111 Issue Date 17-Apr-2018 Version 2.1

Product Name Free Chlorine Buffer for CL-17 Analyzer Revision Date 17-Apr-2018

Page 4/12

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state

Liquid

Appearance

aqueous solution

Color

vellow

Bland

Values

Odor threshold No data available

Molecular weight No data available

рΗ

Odor

Property

7.06

Melting point/freezing point Boiling point / boiling range

-65 °C / -85 °F 99 °C / 210 °F 0.53 (water = 1)

Evaporation rate Vapor pressure

22.427 mm Hg / 2.99 kPa at 25 °C / 77 °F

Estimation based on theoretical

Remarks • Method

calculation

Vapor density (air = 1) 0.62 (air = 1)

Specific gravity (water = 1 / air = 1) Partition Coefficient (n-octanol/water)

Not applicable

Soil Organic Carbon-Water Partition

Not applicable

1.21

Coefficient

No data available Autoignition temperature No data available Decomposition temperature No data available Dynamic viscosity

Kinematic viscosity

No data available

Solubility(ies) Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Solubility in other solvents

Chemical Name	Solubility classification	Solubility	Solubility Temperature
Acid	Soluble	> 1000 mg/L	25 °C / 77 °F

Other Information

Metal Corrosivity

Steel Corrosion Rate No data available No data available **Aluminum Corrosion Rate**

Volatile Organic Compounds (VOC) Content

EN / AGHS Page



Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.1 Page 5/12

Explosive properties

Upper explosion limit No data available Lower explosion limit No data available

Flammable properties

Flash point No data available

Flammability Limit in Air

Upper flammability limit:
Lower flammability limit:
No data available
No data available

Oxidizing properties
No data available.

Bulk density Not applicable

Particle Size No information available

Particle Size Distribution No information available

10. STABILITY AND REACTIVITY

Reactivity
Not applicable.

Chemical stability

Stability Stable under normal conditions

Explosion data

Sensitivity to Mechanical Impact None Sensitivity to Static Discharge None.

Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing.

Hazardous polymerization
None under normal processing.

Conditions to avoid

Conditions to avoid None known based on information supplied.

Incompatible materials

Incompatible materials Strong oxidizing agents, strong acids, and strong bases.

Hazardous Decomposition Products

Heating to decomposition releases toxic fumes of carbon monoxide and carbon dioxide.

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information

 Inhalation
 No known effect based on information supplied.

 Eye contact
 No known effect based on information supplied.

 Skin contact
 No known effect based on information supplied.

 Ingestion
 No known effect based on information supplied.

EN / AGHS Page 5/12



Product Code(s) 2314111 Issue Date 17-Apr-2018 Product Name Free Chlorine Buffer for CL-17 Analyzer

Revision Date 17-Apr-2018

Page 6/12

Symptoms No information available.

Aggravated Medical Conditions None known.

Toxicologically synergistic None known.

products

Version 2.1

Toxicokinetics, metabolism and No information available.

distribution

Product Acute Toxicity Data

Oral Exposure Route

Dermal Exposure Route

Inhalation (Dust/Mist) Exposure Route

Inhalation (Vapor) Exposure Route

Inhalation (Gas) Exposure Route

No data available

No data available

No data available

No data available

Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

Acute Toxicity Estimations (ATE)

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)	2,870.00 mg/kg
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	No information available
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

Ingredient Acute Toxicity Data

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
No data available
No data available
No data available

Ingredient Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Aspiration toxicity

No data available

Product Skin Corrosion/Irritation Data

No data available.

Ingredient Skin Corrosion/Irritation Data

If available, see data below

Product Serious Eye Damage/Eye Irritation Data

EN / AGHS	Page 6	3/12
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Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.1 Page 7/12

No data available.

Ingredient Eye Damage/Eye Irritation Data

No data available

Sensitization Information

Product Sensitization Data

Skin Sensitization Exposure Route
Respiratory Sensitization Exposure Route
No data available.
No data available.

Ingredient Sensitization Data

 Skin Sensitization Exposure Route
 If available, see data below.

 Respiratory Sensitization Exposure Route
 If available, see data below.

Chronic Toxicity Information

Product Specific Target Organ Toxicity Repeat Dose Data

 Oral Exposure Route
 No data available.

 Dermal Exposure Route
 No data available.

 Inhalation (Dust/Mist) Exposure Route
 No data available.

 Inhalation (Vapor) Exposure Route
 No data available.

 Inhalation (Gas) Exposure Route
 No data available.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Carcinogenicity Data

 Oral Exposure Route
 No data available

 Dermal Exposure Route
 No data available

 Inhalation (Dust/Mist) Exposure Route
 No data available

 Inhalation (Vapor) Exposure Route
 No data available

 Inhalation (Gas) Exposure Route
 No data available

Ingredient Carcinogenicity Data

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply
NTP (National Toxicology Program)	Does not apply
OSHA (Occupational Safety and Health Administration of the US Department of	Does not apply
Labor)	

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Germ Cell Mutagenicity invitro Data

No data available.

Ingredient Germ Cell Mutagenicity invitro Data

No data available

Product Germ Cell Mutagenicity invivo Data

EN / AGHS Page 7/12

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application

E-157 of 208



Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.1 Page 8/12

Oral Exposure RouteNo data availableDermal Exposure RouteNo data availableInhalation (Dust/Mist) Exposure RouteNo data availableInhalation (Vapor) Exposure RouteNo data availableInhalation (Gas) Exposure RouteNo data available

Ingredient Germ Cell Mutagenicity invivo Data

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Reproductive Toxicity Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
No data available
No data available
No data available

Ingredient Reproductive Toxicity Data

Oral Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

12. ECOLOGICAL INFORMATION

Ecotoxicity Not considered to be harmful to aquatic life

Product Ecological Data

Aquatic toxicity

Fish No data available Crustacea No data available Algae No data available

Ingredient Ecological Data

Aquatic toxicity

FishNo data availableCrustaceaNo data availableAlgaeNo data available

Other Information

Persistence and degradability

Product Biodegradability Data

No data available.

Ingredient Biodegradability Data

Bioaccumulation

Product Bioaccumulation Data

No data available.

EN / AGHS Page 8/12



Issue Date 17-Apr-2018 Revision Date 17-Apr-2018

Version 2.1 Page 9/12

Partition Coefficient (n-octanol/water)

Not applicable

Ingredient Bioaccumulation Data

Mobility

Soil Organic Carbon-Water Partition Coefficient Not applicable

Water solubility

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Other adverse effects

No information available

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused

products

Dispose of in accordance with local regulations. Dispose of waste in accordance with

environmental legislation.

Contaminated packaging Do not reuse empty containers.

Special instructions for disposal Open cold water tap completely, slowly pour the material to the drain.

14. TRANSPORT INFORMATION

U.S. DOT Not regulated

TDG Not regulated

IATA Not regulated

IMDG Not regulated

Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods.

If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories

TSCA Complies Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EN / AGHS Page 9/12



Product Code(s) 2314111 Issue Date 17-Apr-2018

Version 2.1

NZIoC

Product Name Free Chlorine Buffer for CL-17 Analyzer

Revision Date 17-Apr-2018

Page 10/12

EINECS/ELINCS

ENCS

Does not comply

IECSC

KECL

PICCS

Does not comply

Complies

Complies

Does not comply

Complies

Does not comply

TCSI

AICS

Does not comply

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

Does not comply

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substances Inventory

AICS - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

Acute health hazard Yes
Chronic Health Hazard No
Fire hazard No
Sudden release of pressure hazard No
Reactive Hazard No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

U.S. EPA Label Information

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

EN / AGHS Page 10/12



Product Code(s) 2314111 Issue Date 17-Apr-2018 Version 2.1

Revision Date 17-Apr-2018

Product Name Free Chlorine Buffer for CL-17 Analyzer

Page 11 / 12

Special Comments

Non

Additional information

Global Automotive Declarable Substance List (GADSL)

Not applicable

NFPA and HMIS Classifications

NFPA	Health hazards - 0	Flammability - 0	Instability - 0	Physical and Chemical
			1200	Properties -
HMIS	Health hazards - 0	Flammability - 0	Physical Hazards - 0	Personal protection - X
				- See section 8 for more
				information

Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH Immediately Dangerous to Life or Health

ACGIH (American Conference of Governmental Industrial Hygienists)

NDF no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)

MAC Maximum Allowable Concentration Ceiling Ceiling Limit Value

X Listed Vacated These values have no official status. The only

binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state

regulations.

SKN*Skin designationSKN+Skin sensitizationRSP+Respiratory sensitization**Hazard DesignationCCarcinogenRReproductive toxicant

M mutagen

Prepared By Hach Product Compliance Department

 Issue Date
 17-Apr-2018

 Revision Date
 17-Apr-2018

Revision Note None

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

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EN / AGHS Page 11 / 12



Product Code(s) 2314111 Issue Date 17-Apr-2018 Version 2.1

Product Name Free Chlorine Buffer for CL-17 Analyzer **Revision Date** 17-Apr-2018 **Page** 12 / 12

End of Safety Data Sheet

EN / AGHS Page 12/12



HACH 2756549





SAFETY DATA SHEET

Issue Date 31-Aug-2016 Revision Date 29-Dec-2017 Version 3.1 Page 1/14

1. IDENTIFICATION

Product identifier

Product Name pH Storage Solution

Other means of identification

 Product Code(s)
 2756549

 Safety data sheet number
 M01702

Recommended use of the chemical and restrictions on use

Recommended Use Laboratory reagent. Electrode storage solution.

Uses advised against None.
Restrictions on use None.

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

Emergency telephone number

+1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Not a dangerous substance or mixture according to the Globally Harmonized System (GHS)

Hazards not otherwise classified (HNOC)

Not applicable

<u>Label elements</u>

Hazard statements

The product contains no substances which at their given concentration, are considered to be hazardous to health

Other Information

Not applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

EN / AGHS Page 1/14



Product Name pH Storage Solution **Revision Date** 29-Dec-2017

Page 2/14

Substance Not applicable

Mixture

Percent ranges are used where confidential product information is applicable.

Chemical r	name	CAS No.	Percent Range	HMRIC#
Phosphoric acid, pota	ssium salt (1:1)	7778-77-0	<1%	-
Sodium phospha	ate dibasic	7558-79-4	<0.1%	=
Glutaralde	hyde	111-30-8	<0.1%	
Chemical name	CAS No.	Weight-%		
Phosphoric acid, potassium salt (1:1)	7778-77-0	0.34		

4. FIRST AID MEASURES

Description of first aid measures

General advice No hazards which require special first aid measures. Use first aid treatment according to

the nature of the injury.

Inhalation Remove to fresh air.

Eye contact Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids.

Consult a physician.

Skin contact Wash skin with soap and water.

Ingestion Clean mouth with water and drink afterwards plenty of water.

Most important symptoms and effects, both acute and delayed

Symptoms See Section 11 for additional Toxicological Information.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media Use extinguishing measures that are appropriate to local circumstances and the

surrounding environment.

Unsuitable Extinguishing Media Caution: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the

chemical

No information available.

Hazardous combustion products This material will not burn.

Special protective equipment for

fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout

gear.

EN / AGHS Page 2/14



Product Name pH Storage Solution Revision Date 29-Dec-2017 Page 3 / 14

6. ACCIDENTAL RELEASE MEASURES

U.S. Notice Only persons properly qualified to respond to an emergency involving hazardous

substances may respond to a spill according to federal regulations (OSHA 29 CFR

1910.120(a)(v)) and per your company's emergency response plan and

guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations

should respond to a spill involving chemicals.

Personal precautions, protective equipment and emergency procedures

Personal precautions Ensure adequate ventilation.

Environmental precautions

Environmental precautions See Section 12 for additional ecological information.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Pick up and transfer to properly labeled containers.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

Reference to other sections See section 8 for more information. See section 13 for more information.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place.

Flammability class Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Glutaraldehyde	Ceiling: 0.05 ppm	(vacated) Ceiling: 0.2 ppm	Ceiling: 0.2 ppm
CAS#: 111-30-8		(vacated) Ceiling: 0.8 mg/m ³	Ceiling: 0.8 mg/m ³

Appropriate engineering controls

Engineering Controls Showers

Eyewash stations Ventilation systems.

Individual protection measures, such as personal protective equipment

EN / AGHS Page 3/14



Product Code(s) 2756549 Product Name pH Storage Solution Issue Date 31-Aug-2016 Revision Date 29-Dec-2017

Version 3.1

Page 4/14

Respiratory protection No protective equipment is needed under normal use conditions. If exposure limits are

exceeded or irritation is experienced, ventilation and evacuation may be required.

Hand Protection Wear suitable gloves.

Wear safety glasses with side shields (or goggles). Eye/face protection

Skin and body protection No special protective equipment required.

General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practice.

Environmental exposure controls Local authorities should be advised if significant spillages cannot be contained. Do not

allow into any sewer, on the ground or into any body of water.

Thermal hazards None under normal processing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state

Molecular weight

Liquid

aqueous solution **Appearance** clear

Color colorless

Odor Odorless Odor threshold No data available

Values Property No data available

pH

~ -49 °C / -56 °F Melting point/freezing point

Estimation based on theoretical

Remarks • Method

calculation

Boiling point / boiling range ~ 113 °C / 235 °F

Estimation based on theoretical

calculation

Evaporation rate 0.87 (water = 1) Estimation based on theoretical

calculation

16.502 mm Hg / 2.2 kPa at 20 °C / 68 °F Vapor pressure

Estimation based on theoretical

calculation

Vapor density (air = 1) 0.62

Specific gravity (water = 1 / air = 1) 1.15 Estimation based on theoretical

calculation

Partition Coefficient (n-octanol/water)

Soil Organic Carbon-Water Partition

Not applicable

Coefficient

Not applicable No data available

Autoignition temperature

No data available

Decomposition temperature

No data available

Dynamic viscosity Kinematic viscosity

No data available

Solubility(ies)

EN / AGHS Page 4/14



Product Name pH Storage Solution **Revision Date** 29-Dec-2017

Page 5/14

Water solubility

Water solubility classification	Water solubility_	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Solubility in other solvents

	Chemical Name_	Solubility classification	Solubility	Solubility Temperature
-	Acid	Soluble	> 1000 mg/L	25 °C / 77 °F

Other Information

Metal Corrosivity

Steel Corrosion Rate
Aluminum Corrosion Rate

No data available No data available

Volatile Organic Compounds (VOC) Content

See ingredients information below

Chemical name	CAS No.	Volatile organic compounds (VOC) content	CAA (Clean Air Act)
Phosphoric acid, potassium salt (1:1)	7778-77-0	No data available	2
Sodium phosphate dibasic	7558-79-4	No data available	<u>=</u>
Glutaraldehyde	111-30-8	No data available	=

Explosive properties

Upper explosion limitNo data availableLower explosion limitNo data available

Flammable properties

Flash point No data available
Method No information available

Flammability Limit in Air

Upper flammability limit:
Lower flammability limit:
No data available
No data available

Oxidizing properties
No data available.

Bulk density Not applicable

Particle Size No information available
Particle Size Distribution No information available

10. STABILITY AND REACTIVITY

Reactivity
Not applicable.

Chemical stability

Stability Stable under normal conditions.

Explosion data

EN / AGHS Page 5/14



Product Name pH Storage Solution Revision Date 29-Dec-2017 Page 6 / 14

Sensitivity to Mechanical Impact None Sensitivity to Static Discharge None.

Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing.

Hazardous polymerization

None under normal processing.

Conditions to avoid

Conditions to avoid None known based on information supplied.

Incompatible materials

Incompatible materials Strong oxidizing agents, strong acids, and strong bases.

Hazardous Decomposition Products

Chlorides. Potassium oxide.

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information

Inhalation No known effect based on information supplied.

Eye contact No known effect based on information supplied.

Skin contact No known effect based on information supplied.

Ingestion No known effect based on information supplied.

Symptoms No information available.

Aggravated Medical Conditions None known. Toxicologically synergistic None known.

products

Toxicokinetics, metabolism and See ingredients information below.

distribution

Chemical name	Toxicokinetics, metabolism and distribution	
Sodium phosphate	Phosphates are widely utilized by cells for metabolism of proteins, fats and carbohydrates.	
dibasic		
(<0.1%)		
CAS#: 7558-79-4		

Product Acute Toxicity Data

Oral Exposure Route

Dermal Exposure Route

Inhalation (Dust/Mist) Exposure Route

Inhalation (Vapor) Exposure Route

Inhalation (Gas) Exposure Route

No data available

No data available

No data available

No data available

Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

Acute Toxicity Estimations (ATE)

The following values are calculated based on chapter 3.1 of the GHS document

EN / AGHS Page 6/14



Product Name pH Storage Solution **Revision Date** 29-Dec-2017

Page 7/14

ATEmix (oral)	13,347.00 mg/kg
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	No information available
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

Ingredient Acute Toxicity	Data
---------------------------	------

Oral Exposure Route				If available, see data below	
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Phosphoric acid, potassium salt (1:1) (<1%) CAS#: 7778-77-0	Mouse LD50	1700 mg/kg	None reported	None reported	IUCLID (The International Uniform Chemical Information Database)
Glutaraldehyde (<0.1%) CAS#: 111-30-8	Rat LD50	134 mg/kg	None reported	None reported	GESTIS (Information System on Hazardous Substances of the German Social Accident Insurance)
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sodium phosphate dibasic (<0.1%) CAS#: 7558-79-4	Rat LD50	17000 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)

Dermal Exposure Ro	ute			If available, see data below	
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Glutaraldehyde (<0.1%) CAS#: 111-30-8	Rabbit LD50	594 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Phosphoric acid, potassium salt (1:1) (<1%) CAS#: 7778-77-0	Rabbit LD50	> 4640 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)
Inhalation (Dust/Mist) Exposure R	oute		If available, see data below	-

initialation (Dusbinist) Exposure Route				ii available, see aata belevv		
ĺ	Chemical name	Endpoint	Reported	Exposure	Toxicological effects	Key literature references and
ı		type	dose	time	200.5	sources for data
ſ	Glutaraldehyde	Rat	0.48 mg/L	4 hours	None reported	IUCLID (The International
ı	(<0.1%)	LC50	1		70	Uniform Chemical Information
l	CAS#: 111-30-8					Database)

Inhalation (Vapor) Exposure Route Inhalation (Gas) Exposure Route

If available, see data below If available, see data below

Product Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route

Dermal Exposure Route

Inhalation (Dust/Mist) Exposure Route

No data available
Inhalation (Gas) Exposure Route
No data available
No data available

Ingredient Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

EN / AGHS Page 7/14



Product Name pH Storage Solution Revision Date 29-Dec-2017 Page 8 / 14

Aspiration toxicity

No data available

Product Skin Corrosion/Irritation Data

No data available.

Ingredient Skin Corrosion/Irritation Data

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sodium phosphate dibasic (<0.1%) CAS#: 7558-79-4	Standard Draize Test	Rabbit	500 mg	24 hours	Skin irritant	RTECS (Registry of Toxic Effects of Chemical Substances)
Glutaraldehyde (<0.1%) CAS#: 111-30-8	Standard Draize Test	Human	6 mg	72 hours	Corrosive to skin	RTECS (Registry of Toxic Effects of Chemical Substances)

Product Serious Eye Damage/Eye Irritation Data

No data available.

Ingredient Eye Damage/Eye Irritation Data

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sodium phosphate dibasic (<0.1%) CAS#: 7558-79-4	Standard Draize Test	Rabbit	500 mg	24 hours	Eye irritant	RTECS (Registry of Toxic Effects of Chemical Substances)

Sensitization Information

Product Sensitization Data

Skin Sensitization Exposure Route
Respiratory Sensitization Exposure Route
No data available.
No data available.

Ingredient Sensitization Data

Skin Sensitization Exposure Route If available, see data below. Respiratory Sensitization Exposure Route If available, see data below.

Chronic Toxicity Information

Product Specific Target Organ Toxicity Repeat Dose Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available.
No data available.
No data available.
No data available.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

Oral Exposure Route
Dermal Exposure Route
If available, see data below
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Vapor) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route
If available, see data below
Inhalation (Gas) Exposure Route

Product Carcinogenicity Data

 Oral Exposure Route
 No data available

 Dermal Exposure Route
 No data available

EN / AGHS Page 8/14



Product Name pH Storage Solution **Revision Date** 29-Dec-2017

Page 9/14

 Inhalation (Dust/Mist) Exposure Route
 No data available

 Inhalation (Vapor) Exposure Route
 No data available

 Inhalation (Gas) Exposure Route
 No data available

Ingredient Carcinogenicity Data

Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
Phosphoric acid,	7778-77-0	-	-	-	54
potassium salt (1:1)					
Sodium phosphate dibasic	7558-79-4	E 0	(8)	ē .	[H
Glutaraldehyde	111-30-8	띹	12	9	82

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply
NTP (National Toxicology Program)	Does not apply
OSHA (Occupational Safety and Health Administration of the US Department of	Does not apply
Labor)	500 50

Oral Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Germ Cell Mutagenicity invitro Data

No data available.

Ingredient Germ Cell Mutagenicity invitro Data

If available, see data below

Product Germ Cell Mutagenicity invivo Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
Inhalation (Gas) Exposure Route
No data available

Ingredient Germ Cell Mutagenicity invivo Data

Oral Exposure Route If available, see data below Dermal Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

Product Reproductive Toxicity Data

Oral Exposure Route
Dermal Exposure Route
Inhalation (Dust/Mist) Exposure Route
Inhalation (Vapor) Exposure Route
Inhalation (Gas) Exposure Route
No data available
No data available
No data available
No data available

Ingredient Reproductive Toxicity Data

Oral Exposure Route If available, see data below Inhalation (Dust/Mist) Exposure Route If available, see data below Inhalation (Vapor) Exposure Route If available, see data below Inhalation (Gas) Exposure Route If available, see data below

12. ECOLOGICAL INFORMATION

EN / AGHS Page 9/14



Revision Date 29-Dec-2017 Page 10 / 14

Product Name pH Storage Solution

Ecotoxicity

Product Ecological Data

Aquatic toxicity

FishNo data availableCrustaceaNo data availableAlgaeNo data available

Ingredient Ecological Data

Aquatic toxicity

If available, see ingredient data below Fish Chemical name Key literature references and Exposure **Species** Endpoint Reported time type dose sources for data Glutaraldehyde 96 hours None reported 3.5 mg/L NIH (National Institutes of Health) LC₅₀ (<0.1%)CAS#: 111-30-8

If available, see ingredient data below Crustacea Chemical name Exposure **Species** Endpoint Reported Key literature references and sources for data time dose type Glutaraldehyde 48 Hours None reported 0.75 mg/L GESTIS (Information System on EC₅₀ (<0.1%)Hazardous Substances of the CAS#: 111-30-8 German Social Accident Insurance)

Algae No data available

Other Information

Persistence and degradability

Product Biodegradability Data

No data available.

Ingredient Biodegradability Data

Chemical name	Test method	Biodegradation	Exposure time	Results
Potassium chloride (10 - 20%) CAS#: 7447-40-7	Inorganic Salt	None reported	None reported	Not readily biodegradable

Bioaccumulation

Product Bioaccumulation Data

No data available.

Partition Coefficient (n-octanol/water) Not applicable

Ingredient Bioaccumulation Data

Mobility

Soil Organic Carbon-Water Partition Coefficient Not applicable

Water solubility

EN / AGHS Page 10/14



Product Name pH Storage Solution Revision Date 29-Dec-2017 Page 11 / 14

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Other adverse effects

No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused products

Dispose of in accordance with local regulations. Dispose of waste in accordance with

environmental legislation.

Contaminated packaging Do not reuse empty containers.

Special instructions for disposal

Check with local municipal and state authorities and waste contractors for pertinent local

information regarding the proper disposal of chemicals.

14. TRANSPORT INFORMATION

 U.S. DOT
 Not regulated

 TDG
 Not regulated

 IATA
 Not regulated

 IMDG
 Not regulated

Note: No special precautions necessary.

Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods.

If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply

15. REGULATORY INFORMATION

National Inventories

TSCA Complies
DSL/NDSL Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EINECS/ELINCS Complies Complies **ENCS IECSC** Complies Complies KECL **PICCS** Complies TCSI Complies Complies AICS **NZIoC** Complies

EN / AGHS Page 11 / 14



Product Name pH Storage Solution Revision Date 29-Dec-2017

Page 12/14

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substances Inventory

AICS - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

Acute health hazard	No
Chronic Health Hazard	No
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sodium phosphate dibasic 7558-79-4	5000 lb	-	-	Х

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

Chemical name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Sodium phosphate dibasic	5000 lb		RQ 5000 lb final RQ
7558-79-4			RQ 2270 kg final RQ

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Sodium phosphate dibasic	X	X	X
7558-79-4			
Glutaraldehyde 111-30-8	Х	Х	X

EN / AGHS	Page 12/14



Product Name pH Storage Solution **Revision Date** 29-Dec-2017

Page 13 / 14

U.S. EPA Label Information

Chemical name	FIFRA	FDA	
Phosphoric acid, potassium salt (1:1)	180.0920	ě	
Sodium phosphate dibasic	180.0910	21 CFR 182.1778,21 CFR 182.6290,21 CFR 182.6778,21 CFR 182.8778	

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Special Comments

None

Additional information

Global Automotive Declarable Substance List (GADSL)

Chemical name	Global Automotive Declarable Substance List Classifications	Global Automotive Declarable Substance List Thersholds
Glutaraldehyde 111-30-8	Declarable Substance (LR) Prohibited Substance (LR)	0.0 %

NFPA and HMIS Classifications

NFPA	Health hazards - 0	Flammability - 0	Instability - 0	Physical and Chemical
				Properties -
HMIS	Health hazards - 0	Flammability - 0	Physical Hazards - 0	Personal protection - X
			**	- See section 8 for more
				information

Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH Immediately Dangerous to Life or Health

ACGIH (American Conference of Governmental Industrial Hygienists)

NDF no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)

MAC Maximum Allowable Concentration Ceiling Ceiling Limit Value

X Listed Vacated These values have no official status. The only binding levels of contaminants are those

listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state

regulations.

SKN* Skin designation SKN+ Skin sensitization
RSP+ Respiratory sensitization ** Hazard Designation
C Carcinogen R Reproductive toxicant
M mutagen

Prepared By Hach Product Compliance Department

EN / AGHS Page 13/14



Product Code(s) 2756549 Issue Date 31-Aug-2016

Version 3.1

Product Name pH Storage Solution Revision Date 29-Dec-2017

Page 14/14

Issue Date 31-Aug-2016 **Revision Date** 29-Dec-2017

Revision Note None

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY©2017

End of Safety Data Sheet

EN / AGHS Page 14/14



WEST C-358P INHIBITOR





HMIS RATING: HEALTH 2 FLAMMABILITY 0 REACTIVITY 0 OTHER C

WEST C-358P Inhibitor

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: WEST C-358P Cooling Tower Inhibitor

PRODUCT DESCRIPTION: An aqueous corrosion and scale inhibitor. This product is designed

specifically for the control of corrosion and mineral scales in open

circulating cooling water systems.

MANUFACTURER:

24 HR. EMERGENCY TELEPHONE NUMBER

Water & Energy Systems Technology, Inc.

Chem-Tel (U.S.): (800) 255-3924

13109 Arctic Circle

Cnem-Tel (U.S.): (800) 25

Santa Fe Springs, CA 92801 Customer Service: (562) 921-5191

2. COMPOSITION / INFORMATION ON INGREDIENTS

EXPOSURE LIMITS

Chemical NameCAS#OSHA PELACGIH TLVPotassium Hydroxide1310-58-32 mg/m³ ceiling2 mg/m³ ceiling

Azole Salts ---- Not Established

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

PHYSICAL APPEARANCE: Yellow liquid, bland odor.

IMMEDIATE CONCERNS: Substance may be harmful if swallowed. Poses little or no immediate hazard.

POTENTIAL HEALTH EFFECTS

EYES: Corrosive to the eyes and may cause severe damage including blindness.

SKIN: Substance may cause slight skin irritation.

SKIN ABSORPTION: Contact causes severe skin irritation and possible burns.

INGESTION: Harmful if swallowed. Results in severe burning and injury.

INHALATION: Harmful if inhaled. Mists may cause damage to the upper respiratory tract and even the lung tissue proper.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: None Known.

ACUTE EFFECTS: Multiple small burns can result from exposure.

SUBCHRONIC/CHRONIC TOXICITY

CHRONIC: Death may occur if penetration into vital areas occurs. Scarring may so constrict or destroy damaged tissue that extensive corrective surgery may be required.

CARCINOGENICITY: This product's ingredients are not found in the Federal or Cal OSHA, NTP, IARC lists of suspected cancer causing agents.

Page 1 of 4

Water & Energy Systems Technology, Inc. 13109 Arctic Circle – Santa Fe Springs, CA 90670 - Telephone (562) 921-5191



WEST C-358P Inhibitor

4. FIRST AID MEASURES

EYES: Flush eye with water for 15 minutes. Get medical attention.

SKIN: Immediately remove clothing under safety shower. Flush skin with large amounts of soap and

water. Wash clothing separately before reuse.

INGESTION: If swallowed, do NOT induce vomiting. Give victim large quantities of water. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person. **INHALATION:** Remove to fresh air. If not breathing, give artificial respiration. Get immediate medical attention.

5. FIRE FIGHTING MEASURES

FLASHPOINT AND METHOD: Not Applicable AUTOIGNITION TEMPERATURE: Not Applicable

EXPLOSION HAZARDS: No unusual fire or explosion hazards **FIRE FIGHTING PROCEDURES:** No special fire fighting procedures

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILL: Clean up spills immediately, observing precautions in Protective Equipment section. Flush with a water spray. Pick up wash liquid with absorbent or vacuum and place in a disposable container.

LARGE SPILL: Large spills should be handled according to a predetermined plan.

ENVIRONMENTAL PRECAUTIONS

WATER SPILL: Do not flush to sewer.

7. HANDLING AND STORAGE

GENERAL PROCEDURES: Use with adequate ventilation. Follow all MSDS/label precautions even after container is emptied because they may retain product residues.

Contents may develop pressure upon prolonged storage. Loosen closure cautiously before opening.

Always add water with constant stirring to avoid generation of excessive amounts of heat.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Local exhaust ventilation may be necessary to control any air contaminants to within their PELs (TLVs) during the use of this product.

PERSONAL PROTECTION

EYES AND FACE: Wear safety glasses with side shields (or goggles) and a face shield. **SKIN:** Nitrile rubber, PVC or Neoprene gloves are suitable protective materials. **RESPIRATORY:** NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. **PROTECTIVE CLOTHING:** Where splashing is possible, full chemically resistant protective clothing, rubber apron and boots are required.

WORK HYGIENIC PRACTICES: Do not get in eyes, on skin, or on clothing.

Page 2 of 4



WEST C-358P Inhibitor

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: Liquid ODOR: Bland odor. COLOR: Amber or yellow

pH: 12.0

PERCENT VOLATILE: None VAPOR DENSITY: Not determined BOILING POINT: >212°F

BOILING POINT: >212°F EVAPORATION RATE: <1 SPECIFIC GRAVITY: 1.124 WATER SOLUBILITY: Soluble

EVAPORATION RATE: <1 (butyl acetate = 1)

10. STABILITY AND REACTIVITY

STABLE: YES

HAZARDOUS POLYMERIZATION: NO

CONDITIONS TO AVOID: Generation of heat by reaction with water or acids.

HAZARDOUS DECOMPOSITION: Carbon monoxide, carbon dioxide, ammonia, and oxides of nitrogen. **INCOMPATIBLE MATERIALS:** Acids, oxidizing materials, halogen compounds, copper, zinc and

galvanized metals.

11. TOXICOLOGICAL INFORMATION

CARCINOGENICITY COMMENTS: This product's ingredients are not found in the Federal or Cal OSHA, NTP, IARC lists of suspected cancer causing agents.

Note: California employers using Cal OSHA regulated carcinogens must register with Cal OSHA.

12. ECOLOGICAL INFORMATION

No data is available at this time regarding the environmental impacts of this product.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Dispose of all wastes in accordance with federal, state, and local regulations.

Page 3 of 4



WEST C-358P Inhibitor

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION)

PROPER SHIPPING NAME: CAUSTIC ALKALI LIQUID, N.O.S. PRIMARY HAZARD CLASS/DIVISION: 8 UN/NA NUMBER: UN 1719 PACKING GROUP: II

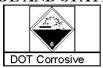
LABEL: Corrosive - 8

NAERG: 154

OTHER SHIPPING INFORMATION: CONTAINS (POTASSIUM HYDROXIDE, LIQUID)

15. REGULATORY INFORMATION

DOT LABEL SYMBOL AND STATEMENT OF HAZARD:



SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)
FIRE: NO PRESSURE GENERATING: NO REACTIVITY: NO ACUTE: NO CHRONIC: NO

16. OTHER INFORMATION

DATE PREPARED: 7/14/2010

MSDS No: C358P

MANUFACTURER DISCLAIMER: The information contained herein is provided in good faith and believed to be correct as of the date hereof. However, WEST, Inc. makes no representation as to the comprehensiveness or accuracy of the information. It is expected that individuals receiving the information will exercise their independent judgement in determining its appropriateness for a particular purpose. Accordingly, WEST, Inc. will not be responsible for damages of any kind resulting from the use of or reliance upon such information. No representations, or warranties, either expressed or implied, of merchantability fitness for a particular purpose or of any other nature are made hereunder with respect to the information set fourth herein or to the product to which the information refers.

Page 4 of 4



WEST C-825





HMIS RATING:
HEALTH 2
FLAMMABILITY 0
REACTIVITY 0
OTHER B

WEST C-825

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: WEST C-825

MANUFACTURER:

Water & Energy Systems Technology, Inc. 13109 Arctic Circle

Santa Fe Springs, CA 92801 Customer Service: (562) 921-5191

24 HR. EMERGENCY TELEPHONE NUMBER

Chem-Tel (U.S.): (800) 255-3924

2. COMPOSITION / INFORMATION ON INGREDIENTS

EXPOSURE LIMITS

Chemical NameCAS#OSHA PELACGIH TLVSodium bisulfate7681-38-1Not DeterminedNot Determined

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION: May cause severe irritation to eyes. May be irritating to respiratory tract.

PHYSICAL APPEARANCE: Clear colorless liquid, odorless POTENTIAL HEALTH EFFECTS

Signs and Symptoms of Acute Overexposure: Contact with mist, or vapor may cause skin irritation. Contact with eyes will cause immediate pain. May be corrosive to corneal tissue. May cause irritation to nose and throat. May be corrosive to esophagal linings and mucous membranes if ingested.

Signs and Symptoms of Chronic overexposure: Repeated exposure may cause chronic bronchitis or respiratory inflammation. Repeated or extended skin contact may be corrosive. Repeated eye contact may cause conjunctivitis and photosensitization

Medical Conditions Generally Aggravated by Exposure: No Data Available

4. FIRST AID MEASURES

Inhalation: Remove victim to fresh air. Get prompt medical attention

Ingestion: Do not induce vomiting. Give victim large amounts of milk or water to drink. Get victim to hospital promptly.

Skin Contact: Remove contaminated clothing and footwear. Wash skin for 15 minutes with soap and water. Wash clothing before reuse. If irritation persists, get medical attention.

Eye Contact: Immediately flush eyes with water for 15 minutes. Forcibly hold eyelids apart to ensure complete irrigation of eye and eyelid tissue. Do not allow victim to rub or keep eyes closed. Get immediate medical attention.

Note to Physician: Treat symptomatically. No specific antidote.

Page 1 of 4

Water & Energy Systems Technology, Inc. 13109 Arctic Circle – Santa Fe Springs, CA 90670 - Telephone (562) 921-5191



WEST C-825

5. FIRE FIGHTING MEASURES

FIRE

Flash point: Not Applicable

Autoignition temperature: Not Applicable Flammable limits in air % by volume:

lel: ND; uel: ND

UNUSUAL FIRE OR EXPLOSION HAZARDS

Not Combustable.

FIRE EXTINGUISHING MEDIA

Not combustible. Use extinguishing method suitable for surrounding fire.

SPECIAL FIRE FIGHTING PRECEDURES:

None

HAZARDOUS DECOMPOSITION MATERIALS (Under Fire Conditions):

Sulfur dioxide and/or sulfur trioxide may be released in fire, if water is allowed to evaporate. Wear SCBA if in fire situation.

6. ACCIDENTAL RELEASE MEASURES

Evacuation Procedures and Safety:

Ventilate closed spaces before entering. Wear appropriate protective gear for situation. See Personal Protection information in Section 8.

Containment of Spill:

Follow procedure described below under Cleanup and Disposal of Spill

Cleanup and Disposal of Spill:

Scrape up and place in appropriate closed container (see Section 7: Handling and Storage). Collect washings for disposal. Decontaminate tools and equipment following cleanup. Clean up residual material by washing area with water. Avoid creation of dusty conditions.

Environmental and Regulatory Reporting:

Do not flush to drain. If spilled on the ground, the affected area should be scraped clean placed in an appropriate container for disposal. Prevent material form entering public sewer system or any waterways. Large spills should be handled according to a predetermined plan. For assistance in developing a plan contact with the WEST Inc. using the Customer Service phone number in Section 1.

7. HANDLING AND STORAGE

GENERAL PROCEDURES:

Protect against physical damage. Normal precautions common to safe manufacturing practice should be followed in handling and storage. Do not get in eyes. Do not breathe dusts. Avoid direct or prolonged contact with skin. Containers of this material may be hazardous when empty since they retain product residues; observe all warnings and precautions listed for the product. Store in an area that is cool, dry, well-ventilated

FOR INDUSTRY USE ONLY.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Introductory Remarks:

These recommendations provide general guidance for handling this product. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. While developing safe handling procedures, do not overlook the need to clean equipment and piping systems for maintenance and repairs. Waste resulting from these procedures should be handled in accordance with Section 13: Disposal Considerations.

Page 2 of 4



WEST C-825

OSHA Final PELs: NDA OSHA Vacated PELs: NDA

Engineering Controls:

Where engineering controls are indicated by use conditions or a potential for excessive exposure exists, the following traditional exposure control techniques may be used to effectively minimize employee exposures.

Respiratory Protection:

When respirators re required, select NIOSH/MSHA approved equipment based on actual or potential airborne concentrations and in accordance with the latest OSHA standard (29 CFR 1910.134) and/or ANSI Z88.2 recommendations. Under normal conditions, in the absence of other airborne contaminants, the following devices should provide protection from this material up to the conditions specified by OSHA/ANSI: Air-purifying (half-mask / full-face) respirator with cartridges / canister approved for use against dusts, mists and fumes.

Eye/Face Protection:

Eye and face protection requirements will vary dependent upon work environment conditions and material handling practices. Appropriate ANSI Z87 approved equipment should be selected for the particular use intended for this material. It is generally regarded as good practice to wear a minimum of safety glasses with side shields when working in industrial environments.

Skin Protection:

Skin contact should be minimized through use of gloves and suitable long-sleeved clothing (i.e., shirts and pants). Consideration must be given both to durability as well as permeation resistance.

Work Practice Controls:

Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material:

- Do not store, use, and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored.
- Wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics, or using the toilet.
- 3) Wash exposed skin promptly to remove accidental splashes of contact with this material.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation*, *A Manual of Recommended Practices*, most recent edition, for details.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Clear Colorless Liquid

 Odor:
 Odorless

 Solubility:
 Water-soluble

 Specific Gravity:
 1.147 at 20°C (68 F)

pH: 1.0-2.0
Boiling Point: ~212 ⁰F
Melting Point: Not Applicable
Vapor Density (Air=1): Not Applicable
Vapor Pressure (kPa): Not Applicable

10. STABILITY AND REACTIVITY

Stability: Product is stable under normal conditions of storage and handling.

Hazardous Decomposition Products: Sulphur dioxide and sulphur trioxide gases.

Hazardous Polymerization: will not occur.

Incompatibility: Strong oxidizers, nitric acid, chlorine. Solution is acidic and reacts with bases.

Conditions to Avoid: Incompatible substances.

Page 3 of 4



WEST C-825

11. TOXICOLOGICAL INFORMATION

Toxicological Data:

Considered GRAS by FDA. Carcinogenicity: Sodium bisulfate and water are not listed by ACGIH, IARC, NIOSH, NTR, or OSHA

12. ECOLOGICAL INFORMATION

Ecotoxicological Information:

No data found for product.

Chemical Fate Information:

No data found for product.

13. DISPOSAL CONSIDERATIONS

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. State and local disposal regulations may differ from federal disposal regulations. Empty containers may contain residues. Thoroughly clean empty container, then offer for recycling, reuse or disposal in accordance with federal, state and local requirements.

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION)

DOT Proper Shipping Name: CORROSIVE LIQUID, N.O.S., 8,UN1760, PG III

CONTAINS (INORGANIC ACID SOLUTION)

DOT Hazard Class: 8 (Corrosive)

UN Number: 1760

15. REGULATORY INFORMATION

TSCA: All chemical ingredients are listed on TSCA inventory, with no special reporting regulations CERCLA Reportable Quantity: Not subject to CERCLA reporting SARA TITLE III:

Section 302/304 Extremely Hazardous Substances: None

Section 311 Hazard Categorization: Acute Health

Section 313 Toxic Chemicals: NDA

Not subject to Proposition 65 labeling requirements (California)

CAA: Ingredients not listed as hazardous pollutants under CAA

OSHA: None of the ingredients are considered Extremely Hazardous by OSHA.

16. OTHER INFORMATION

DATE PREPARED: 2/23/2011

MSDS No: C-825

MANUFACTURER DISCLAIMER: The information contained herein is provided in good faith and believed to be correct as of the date hereof. However, WEST, Inc. makes no representation as to the comprehensiveness or accuracy of the information. It is expected that individuals receiving the information will exercise their independent judgement in determining its appropriateness for a particular purpose. Accordingly, WEST, Inc. will not be responsible for damages of any kind resulting from the use of or reliance upon such information. No representations, or warranties, either expressed or implied, of merchantability fitness for a particular purpose or of any other nature are made hereunder with respect to the information set fourth herein or to the product to which the information refers.

Page 4 of 4



WEST R-630





HMS RATING: HEALTH 1 FLAMMABILITY 0 REACTIMTY 0 OTHER C

Safety Data Sheet WEST R-630

SECTION 1: Identification

1.1 Product identifier

Product name WEST R-630 Sulfite

Product number R-630

1.2 Recommended use An aqueous solution of sodium and potassium sulfites, bisulfites and

metabisulfites designed specifically for halogen removal in process water

systems.

1.3 Supplier's details

Signal word

Name Water & Energy Systems Technology, Inc.

Address 13109 Arctic Cr.

Santa Fe Springs, CA 90670

Telephone (562) 921-5191

Emergency phone number(s) Chem-Tel (U.S.): (800) 255-3924

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

GHS classification in accordance with OSHA (29 CFR 1910.1200)

Warning

- Skin corrosion/irritation (chapter 3.2), Cat. 3
- Eye damage/irritation (chapter 3.3), Cat. 2B

2.2 GHS label elements, including precautionary statements

1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	
Hazard statement(s)	
H316	Causes mild skin irritation
H320	Causes eye irritation
Precautionary statement(s)	
P332+P313	If skin irritation occurs: Get medical advice/attention.
P264	Wash hands thoroughly after handling.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P337+P313	If eye irritation persists: Get medical advice/attention.

SECTION 3: Composition/information on ingredients

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 1 of 6



Safety Data Sheet WEST R-630

3.1 Mixtures

This product does not contain any hazardous materials under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

Trade secret statement (OSHA 1910.1200(i))

Specific chemical identity and/or exact percentage of composition has been withheld as a trade secret.

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

General advice Avoid contact with skin, eyes and clothing. Wash hands before breaks and

immediately after handling the product.

If inhaled Remove to fresh air. If not breathing, give artificial respiration. Get immediate

medical attention.

In case of skin contact Immediately remove clothing under safety shower. Flush skin with large

amounts of soap and water. Wash clothing separately before reuse.

In case of eye contact Flush eye with water for 15 minutes. Get medical attention.

If swallowed Do NOT induce vomiting. Give victim large quantities of water. Call a

physician or poison control center immediately.

Personal protective equipment for first-aid responders

No data available.

4.2 Most important symptoms/effects, acute and delayed

No data available.

4.3 Indication of immediate medical attention and special treatment needed, if necessary

No data available.

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

No data available.

5.2 Specific hazards arising from the chemical

No data available.

5.3 Special protective actions for fire-fighters

No special fire fighting procedures.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Wear appropriate personal protective equipment as specified in Section 8.

6.2 Environmental precautions

Do not flush to sewer.

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 2 of 6



Safety Data Sheet **WEST R-630**

Methods and materials for containment and cleaning up

No data available.

SECTION 7: Handling and storage

Precautions for safe handling

Use with adequate ventilation. Follow all SDS/label precautions even after container is emptied because they may retain product residues.

Conditions for safe storage, including any incompatibilities

Contents may develop pressure upon prolonged storage. Loosen closure cautiously before opening.

SECTION 8: Exposure controls/personal protection

Control parameters

No exposure limits noted for ingredient(s).

Appropriate engineering controls

Local exhaust ventilation may be necessary to control any air containments to within their PELs (TLVs) during the use of this product.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear safety glasses with side shields (or goggles) and a face shield.

Skin protection

Nitrile rubber, PVC, or Neoprene gloves are suitable protective materials.

Body protection

Where splashing is possible, full chemically resistant protective clothing, rubber apron and boots are required.

Respiratory protection

NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited.

Thermal hazards

No data available.

Environmental exposure controls

No data available.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance/form Clear pink liquid Odor No appreciable odor. Odor threshold No data available. ~6.5

No data available. Melting point/freezing point

Initial boiling point and boiling range 212 F

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 3 of 6

LA-UR-19-22215



Safety Data Sheet WEST R-630

No data available.

No data available. Flash point Evaporation rate <1 (butvl acetate = 1) Flammability (solid, gas) No data available. Vapor pressure No data available. Vapor density No data available. Relative density 1.251 Solubility(ies) Water Soluble Partition coefficient: n-octanol/water No data available. No data available. Auto-ignition temperature Decomposition temperature No data available. No data available. Viscosity No data available. Explosive properties

SECTION 10: Stability and reactivity

10.1 Reactivity

No data available.

Oxidizing properties

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available.

10.4 Conditions to avoid

Generation of heat by reaction with water or acids.

10.5 Incompatible materials

Acids, oxidizing materials, halogen compounds, copper, zinc and galvanized metals.

10.6 Hazardous decomposition products

Carbon monoxide, carbon dioxide, ammonia, and oxides of nitrogen.

SECTION 11: Toxicological information

Information on toxicological effects

Acute toxicity

No data available.

Skin corrosion/irritation

No data available.

Serious eye damage/irritation

No data available.

Respiratory or skin sensitization

No data available.

Germ cell mutagenicity

No data available.

Carcinogenicity

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 4 of 6



Safety Data Sheet WEST R-630

This product's ingredients are not found in the federal or Cal OSHA NTP, or IARC lists of suspected cancer causing agents.

Reproductive toxicity

No data available.

STOT-single exposure

No data available.

STOT-repeated exposure

No data available.

Aspiration hazard

No data available.

SECTION 12: Ecological information

Toxicity

No data available.

Persistence and degradability

No data available.

Bioaccumulative potential

No data available.

Mobility in soil

No data available.

Results of PBT and vPvB assessment

No data available.

SECTION 13: Disposal considerations

Disposal of the product

Dispose of all waste in accordance with federal, state, and local regulations.

Disposal of contaminated packaging

Dispose of as unused product.

Waste treatment

No data available.

Sewage disposal

No data available.

SECTION 14: Transport information

DOT (US)

Proper Shipping Name: D.O.T. NONREGULATED WATER TREATMENT LIQUID COMPOUND

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 5 of 6



Safety Data Sheet WEST R-630

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)
FIRE: NO PRESSURE GENERATING: NO REACTIVITY: NO ACUTE: YES CHRONIC: NO

SECTION 16: Other information

Further information/disclaimer

The information contained herein is provided in good faith and believed to be correct as of the date hereof. WEST, Inc. makes no representation as to the comprehensiveness or accuracy of the information. It is expected that the individuals receiving the information will exercise their independent judgment in determining its appropriateness for a particular purpose. Accordingly, WEST, Inc. will not be responsible for damages of any kind resulting in the use of or reliance upon such information. No representations, or warranties, either expressed or implied, of merchantability fitness for a particular purpose or of any other nature are made hereunder with respect to the information set fourth herein or to the product to which the information refers.

Version: 1.0, Date of issue: 2015-05-19, Printed on: 2015-05-20, p. 6 of 6



BRIGHT DYES FLT YELLOW/GREEN LIQUID





Safety Data Sheet

Issue Date: 04-Oct-2013 Revision Date: 06-Feb-2017 Version Number: 1.1

1. Identification

Product Identifiers

Product Name: Bright Dyes® FLT Yellow/Green Liquid

Product Number: 106001

Recommended Use & Restrictions on Use

Water tracing & leak detection dye

Manufacturer/Supplier

Kingscote Chemicals, Inc. 3334 South Tech Blvd. Miamisburg, OH 45342

U.S.A.

Emergency Telephone Number

Company Telephone Number: (937) 886-9100

Emergency Telephone (24 hr): INFOTRAC (800) 535-5053 (North America)

+1-352-323-3500 (International)

2. Hazards Identification

Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least

15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs:

Get medical advice/attention.

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek

medical attention immediately.

Page 1 of 6



Revision Date: 06-Feb-2017

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give

anything by mouth to an unconscious person. Get medical attention if large

quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation.

Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the

system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media

Water spray (fog). Carbon dioxide (CO2). Dry chemical. Regular foam.

Unsuitable Extinguishing Media

Not determined

Specific Hazards Arising from the Chemical

Product is not flammable. Burning/combustion may produce oxides of carbon and nitrogen (NOx).

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or

groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area

with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices.

Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing

should be thoroughly washed before reuse.

Page 2 of 6



Revision Date: 06-Feb-2017

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry, and well-

ventilated area. Keep from freezing.

Incompatible Materials Acids.

8. Exposure Controls / Personal Protection

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection Goggles.

Skin & Body Protection Rubber gloves. Suitable protective clothing.

Respiratory Protection No protection is ordinarily required under normal conditions of use.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practices.

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

 Physical State
 Liquid
 Odor
 None apparent

 Appearance
 Yellow/green liquid
 Odor Threshold
 Not determined

 Color
 Yellow/green

 Property
 Values

 pH
 >8.0

 Melting/Freezing Point
 "32° F

 Boiling Point/Range
 "212° F

 Flash Point
 Not applicable

Evaporation Rate 1.8

Flammability (solid, gas)
Upper Flammability Limits
Lower Flammability Limits
Vapor Pressure
Vapor Density
Relative Density
Liquid – not applicable
Not applicable
Not applicable
0.6
Not applicable

Relative Density
Specific Gravity
Solubility
Partition Coefficient
Auto-ignition Temperature
Decomposition Temperature
Viscosity
Not applicable
Not determined
Not determined
Not determined
Not determined
Not determined

Page 3 of 6



Revision Date: 06-Feb-2017

10. Stability and Reactivity

Reactivity

Not reactive under normal conditions.

Chemical Stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials

Acids. Strong oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation Avoid breathing vapors or mists.

Ingestion Do not ingest.

Skin Contact May cause an allergic skin reaction.

Eye Contact Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure

May cause an allergic skin reaction.

Numerical Measures of Toxicity

Not determined

Symptoms Associated with Exposure

See Section 4 of this SDS for symptoms.

Carcinogenicity

NTP None

IARC None

OSHA None

Page 4 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Liquid

12. Ecological Information

Ecotoxicity

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Not available

Persistence/Degradability

Not determined

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. Disposal Considerations

Waste Disposal Methods

Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

Note

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

OMDG Not regulated

15: Regulatory Information

International Inventories

TASCA This product is not subject to TSCA 12(b) reporting requirements.

U.S. Federal Regulations

CERCLA This material, as supplied, does not contain any substances regulated as

hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Page 5 of 6



Revision Date: 06-Feb-2017

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization

Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of

Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants

pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable

state right-to-know regulations.

16: Other Information

HMIS Health Hazards 1	Flammability O	Instability O	Special Hazards Not determined
NFPA Health Hazards 1	Flammability O	Physical Hazards O	Personal Protection B
Issue Date	04-Oct-2013		
Revision Date	06-Feb-2017		
Revision Note	Content Review		

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Page 6 of 6



BRIGHT DYES FLT YELLOW/GREEN TABLETS





Safety Data Sheet

Issue Date: 09-Nov-2013 Revision Date: 06-Feb-2017 Version Number: 2.1

1. Identification

Product Identifiers

Product Name: Bright Dyes® FLT Yellow/Green Tablet

Product Number: 101101

Recommended Use & Restrictions on Use

Water tracing & leak detection dye

Manufacturer/Supplier

Kingscote Chemicals, Inc. 3334 South Tech Blvd. Miamisburg, OH 45342

U.S.A.

Emergency Telephone Number

Company Telephone Number: (937) 886-9100

Emergency Telephone (24 hr): INFOTRAC (800) 535-5053 (North America)

+1-352-323-3500 (International)

2. Hazards Identification

Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least

15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs:

Get medical advice/attention.

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek

medical attention immediately.

Page 1 of 6



Revision Date: 06-Feb-2017

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give

anything by mouth to an unconscious person. Get medical attention if large

quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation.

Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the

system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media

Water spray (fog). Carbon dioxide (CO2). Dry chemical.

Unsuitable Extinguishing Media

Not determined

Specific Hazards Arising from the Chemical

Remote possibility of dust explosion. Burning may produce oxides of carbon and nitrogen (NOx).

<u>Protective Equipment and Precautions for Firefighters</u>

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or

groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area

with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices.

Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing

should not be allowed out of the workplace.

Page 2 of 6



Revision Date: 06-Feb-2017

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry, and well-

ventilated area. Store away from heat, sparks, open flame or any other

ignition source.

Incompatible Materials Bromine trifluoride. Lithium. Strong acids, bases, and oxidizing agents.

8. Exposure Controls / Personal Protection

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection Avoid contact with eyes.

Skin & Body Protection Rubber gloves. Suitable protective clothing.

Respiratory Protection Use NIOSH-approved dust mask if dusty conditions exist.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practices.

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

Values

Physical StateSolidOdorNone apparentAppearanceOrange tabletOdor ThresholdNot determined

Color Orange

Property

pН Not applicable **Melting/Freezing Point** Not applicable **Boiling Point/Range** Not applicable Not applicable **Flash Point Evaporation Rate** Not applicable Flammability (solid, gas) Not flammable **Upper Flammability Limits** Not applicable **Lower Flammability Limits** Not applicable **Vapor Pressure** Not applicable Not applicable Vapor Density **Relative Density** Not applicable **Specific Gravity** Not applicable

Solubility Highly soluble in water with small amounts of insoluble residue

 Partition Coefficient
 Not determined

 Auto-ignition Temperature
 Not determined

 Decomposition Temperature
 Not determined

 Viscosity
 Not determined

Page 3 of 6



Revision Date: 06-Feb-2017

10. Stability and Reactivity

Reactivity

Not reactive under normal conditions.

Chemical Stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials

Bromine trifluoride. Lithium. Strong acids, bases, and oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation Avoid inhalation of dust.

Ingestion Do not ingest.

Skin Contact May cause an allergic skin reaction.

Eye Contact Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure

May cause an allergic skin reaction.

Numerical Measures of Toxicity

Not determined

Symptoms Associated with Exposure

See Section 4 of this SDS for symptoms.

Carcinogenicity

NTP None

IARC None

OSHA None

Page 4 of 6



Revision Date: 06-Feb-2017

12. Ecological Information

Ecotoxicity

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Not available

Persistence/Degradability

This product is biodegradable.

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. Disposal Considerations

Waste Disposal Methods

Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

<u>Note</u>

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

OMDG Not regulated

15: Regulatory Information

International Inventories

Not determined

U.S. Federal Regulations

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Page 5 of 6



Revision Date: 06-Feb-2017

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization

Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of

Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants

pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable

state right-to-know regulations.

	16: Other	Information	
HMIS Health Hazards 1	Flammability O	Instability O	Special Hazards Not determined
<u>NFPA</u> Health Hazards 1	Flammability O	Physical Hazards O	Personal Protection B
Issue Date	09-Nov-2013		
Revision Date	06-Feb-2017		
Revision Note	Content Review		

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet



Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application Outfall 04A022 Fact Sheet

Science and Technology Operations (STO) TA-3-66 Cooling Water and Roof Drains





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Table of Contents

1.0	OUTFALL LOCATION [Section I]	5
2.0	FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]	5
2.1	Process Schematic and Water Balance [II.A]	5
2.2	Water Treatment Processes [II.B]	5
2.3	Discharge Rate and Frequency [II.C]	6
3.0	PRODUCTION [Section III]	7
4.0	IMPROVEMENTS [Section IV]	7
5.0	INTAKE AND EFFLUENT CHARACTERISTICS [Section V]	7
5.1	Analytical Data [V.A, B, and C]	7
5.2	Potential Pollutants [V.D]	7
6.0	POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]	7
7.0	BIOLOGICAL TOXICITY TESTING DATA [Section VII]	8
8.0	CONTRACT ANALYSIS INFORMATION [Section VIII]	8
ATTAC	HMENT A: Location Map for Outfall 04A022	1
ATTAC	HMENT B: Process Schematic and Water Balance	1
ATTAC	HMENT C: Photographs	1
ATTAC	HMENT D: Summary Discharge Monitoring Report October 2014 – September 2018	1
۸ΤΤ۸	HMENT E: Safety Data Sheets	1

List of Tables

- 1 Sources for Discharges to Outfall 04A022
- 2 Wastewater Treatment Codes Assigned to Outfall 04A022
- 3 List of Treatment Chemicals used in the Operations that Contribute to the Outfall
- 5 Flow Rates and Frequencies for Discharges to Outfall 04A022
- 7 Potential Pollutants by Source for Outfall 04A022
- 8 List of Independent Laboratories Used for NPDES Water Analysis



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INDUSTRIAL AND SANITARY OUTFALLS 2019 NPDES PERMIT RE-APPLICATION OUTFALL 04A022 FACT SHEET

1.0 OUTFALL LOCATION [Section I]

Outfall ID No.:	04A022	Outfall Location:	Technical Area 3
Category:	04A, Potential Treated Once Through	Originating Structure	TA-3-66
	Cooling Water and Storm water from Roof Drains	for the Discharge:	
Flow Type:	Intermittent	Receiving Stream:	Mortandad Canyon, Water Quality Segment 20.6.4.128 NMAC
Longitude:	106° 18′ 58″ W	Latitude:	35° 52′ 17″ N

2.0 FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]

Outfall 04A022 is located at TA-3 and discharges to Mortandad Canyon, Water Quality Segment 20.6.4.128 NMAC. Based upon dye testing, historical building drain information, process equipment observations, and best engineering judgement it has been determine that Outfall 04A022 discharges treated once through cooling water and storm water from TA-3-66. These types of discharges are not consistent with the 04A category and it is recommended that the outfall category be revised to 03A. Attachment A provides a location map. Table 1 identifies the discharge source, the source location, and source composition.

	Table 1 Sources for Discharges to Outfall 04A022						
TA	Building	Type	Transportation Mode (Piping, Truck etc.)	Discharge Source	Source Composition		
3	66	Cooling	Piping	Once Through Cooling Water	Treated Once Through Cooling Water Potentially from the Circulating Tank/Sump and/or the Air Washers (not routine)		
3	66	Cooling	Piping	Emergency Cooling Water	Treated Emergency Cooling Water from the Foundry (not routine)		
3	66	Storm Water	Piping	Area J and K Roof Drains	Storm water		

2.1 Process Schematic and Water Balance [II.A]

A process schematic line drawing that shows the route taken by water from intake to the discharge at Outfall 04A022 is provided in Attachment B. This drawing includes all operations that contribute cooling water, and storm water to the discharge at the outfall. A water balance is also provided on the process schematic with average flows for the cooling tower intakes and blowdown. The water balance is based upon actual data collected from cooling tower operations personnel and the flow meter/totalizer associated with the outfall.

2.2 Water Treatment Processes [II.B]

Outfall 04A022 receives the following discharges:

- Treated once through cooling water potentially from the facility circulating water tank/sump overflow located in the basement of TA-3-66 and/or from the facility Air Washers located in the TA-3-66 mezzanine (overflows when the building cooling demand is high and the units are set to "sustain" (not routine)).
- Emergency treated once through cooling water from the foundry cooling system.
- Storm water from the TA-3-66 Area J and K roof drains.

The cooling and storm water from TA-3-66 is de-chlorinated using de-chlorination tablets that are located at the outfall where it daylights and discharges to the environment. Table 2 identifies the waste water treatment codes associated with the



water treatment system. Attachment C provides photographs of the outfall, cooling towers, and the wastewater treatment equipment.

Table 2					
	Wastewater Treatment Codes Assigned to Outfall 04A022				
Treatment Code	Treatment Code Description Justification				
2-E	De-Chlorination	Chlorine Scavenger Chemicals are Added			
2-L	Reduction	Chemicals that are Corrosion Inhibitors are Added			

The water treatment processes identified in Table 2 utilize chemicals to monitor the water quality in the cooling tower, control corrosion, limit biological growth, and de-chlorinate blowdown prior to discharge. Table 3 provides a list of the chemicals used to treat the water in the cooling towers.

Table 3 List of Treatment Chemicals used in the Operations that Contribute to the Outfall						
Source	Chemical Name Reason for Use		Toxic Pollutant and/or Hazardous Substances Table 2C-3 or 2C-4			
TA-3-66 Treated Once	Formula 2011	Corrosion Inhibitor	Phosphonobutane Tricarboxylic acid	NA		
Through Cooling Water			Phosophineocarboxylic Acid Polymer	NA		
Potentially from the			Benzotriazole	NA		
Circulating Tank/Sump and/or the Air Washers	Formula 314-T	Corrosion Inhibitor	I-Bromo-3-Chloro-5,5-Dimethyl Hydantoin (chlorine source)	2C-4		
(not routine)	Vita-D-Chlor Tablets	De-Chlorination	Ascorbic Acid	NA		
	Bright Dyes FLT	Water Line & Drain	NA	NA		
	Yellow/Green Liquid	Tracing Dye				
	Bright Dyes FLT	Water Line & Drain	NA	NA		
	Yellow/Green Tablet	Tracing Dye				
TA-3-66 Emergency	Formula 2011	Corrosion Inhibitor	Phosphonobutane Tricarboxylic acid	NA		
Treated Once Through			Phosophineocarboxylic Acid Polymer	NA		
Cooling Water from the			Benzotriazole	NA		
Foundry (not routine)	Vita-D-Chlor Tablets	De-Chlorination	Ascorbic Acid	NA		
	Bright Dyes FLT	Water Line & Drain	NA	NA		
	Yellow/Green Liquid	Tracing Dye				
	Bright Dyes FLT	Water Line & Drain	NA	NA		
	Yellow/Green Tablet	Tracing Dye				
TA-3-66 Storm Water Area	NA	NA	NA	NA		
J and K Roof Drains	Bright Dyes FLT	Water Line & Drain	NA	NA		
	Yellow/Green Liquid	Tracing Dye				
	Bright Dyes FLT	Water Line & Drain	NA	NA		
	Yellow/Green Tablet	Tracing Dye				

2.3 Discharge Rate and Frequency [II.C]

The discharge rates and frequencies for Outfall 04A022 are provided in Table 4.

Table 4 Flow Rates and Frequencies for Discharges to Outfall 04A022							
	Frequency		Flow Rate	es and Volur	nes		
Source ^a	Days/Week	Months	Average (MGD)	Maximum (MGD)	Average Volume (GPD)	Maximum Volume (GPD)	Duration (days)
TA-3-66 Treated Once Through Cooling Water Potentially from the Circulating Tank/Sump and/or the Air Washers (not routine)	7.0	12.0	0.0010	0.014	1,020	14,400	365



Table 4 Flow Rates and Frequencies for Discharges to Outfall 04A022							
	Frequency		Flow Rate	es and Volur	nes		
Source ^a	Days/Week	Months	Average (MGD)	Maximum (MGD)	Average Volume (GPD)	Maximum Volume (GPD)	Duration (days)
TA-3-66 Emergency Treated Once Through Cooling Water from the Foundry (not routine)	0.4	0.7	0.0010	0.028	1,008	28,000	22
TA-3-66 Area J and K Roof Drain Storm Water	0.9	1.6	0.0014	0.007	1,413	6,894	49

a. Calculated between October 2017 and September 2018.

GPD = gallons per day; MGD = million gallons per day

3.0 PRODUCTION [Section III]

Section III is not applicable to Outfall 04A022.

4.0 IMPROVEMENTS [Section IV]

Section IV is not applicable to Outfall 04A022.

5.0 INTAKE AND EFFLUENT CHARACTERISTICS [Section V]

5.1 Analytical Data [V.A, B, and C]

The analytical results provided for the Outfall 04A022 Permit Reapplication on the Form 2C were provided from the following sources:

- Samples collected on August 20, 2018 and shipped to an independent laboratory for analysis.
- Field samples collected and analyzed on August 20, 2018 for temperature, residual chlorine, and pH.
- Field samples collected and analyzed on January 23, 2019 for sulfite.
- DMR Summary for Outfall 04A022 from October 2014 to September 2018 (Attachment D).
- Hardness = 44.5 mg/L (CaCO₃)

5.2 Potential Pollutants [V.D]

The treatment chemicals associated with the cooling system water treatment system and the use of potable makeup water constitute the pollutant load of the discharge to Outfall 04A022. Table 5 identifies the Table 2C-3 and 2C-4 pollutants by discharge source. It also identifies those pollutants (if any) that were detected in the analytical results from the samples collected for the 2019 Permit Renewal Application.

Table 5 Potential Pollutants by Source for Outfall 04A022					
Source	POTENTIAL Toxic Pollutant and/or Haz Substances Table 2C-3 o	ardous	Blowdown Analytical Data Results		
TA-3-66 Treated Once Through Cooling Water Potentially from the Circulating Tank/Sump and/or the Air Washers	chlorine	2C-4	Residual Chlorine = 0		

The safety data sheets associated with the chemicals used to treat the cooling water are provided in Attachment E.

6.0 POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]

Section VI is not applicable to Outfall 04A022.



7.0 BIOLOGICAL TOXICITY TESTING DATA [Section VII]

Section VII is not applicable to Outfall 04A022.

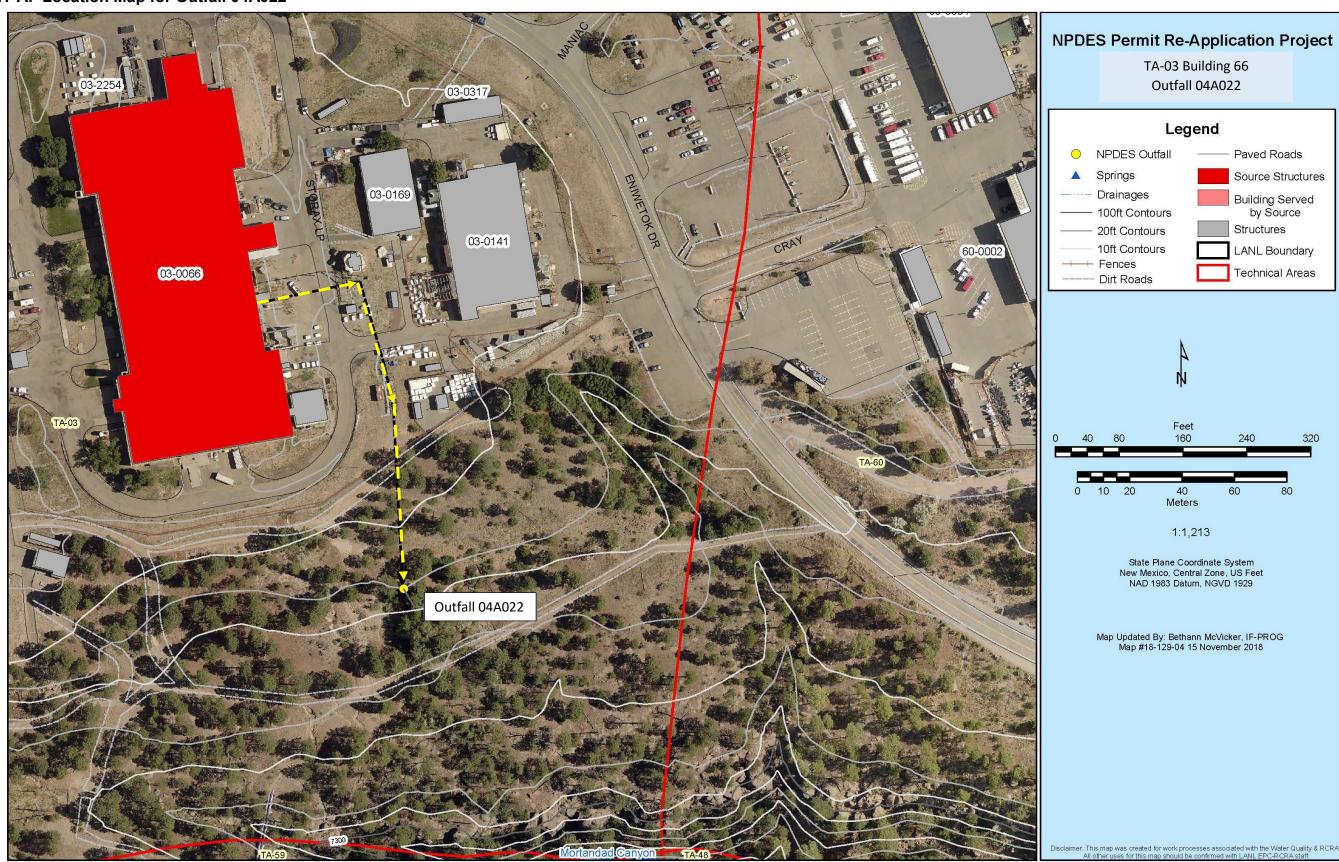
8.0 CONTRACT ANALYSIS INFORMATION [Section VIII]

Samples from the outfall were collected on August 20, 2018 for the Form 2C constituents required by the permit application forms. These samples were submitted to independent laboratories as summarized in Table 8.

Table 8 List of Independent Laboratories Used for NPDES Water Analysis					
Laboratory Name	Address and Contact Info	Parameters			
GEL Laboratories LLC	2040 Savage Road Charleston SC 29407 (843) 556-8171	Biological Oxygen Demand, General Chemistry, Pesticides, Polychlorinated Biphenyls, Radiochemistry, Semi-volatile Organic Compounds, Total Metals, Total Suspended Solids, Volatile Organic Compounds			
New Mexico Water Testing Laboratory, Inc.	401 North Coronado Ave Espanola, NM 87532 (505) 929-4545	E.coli			
Cape Fear Analytical LLC	3306 Kitty Hawk Road Suite 120 Wilmington, NC 28405 (910) 795-0421	TCDD (Dioxin)			

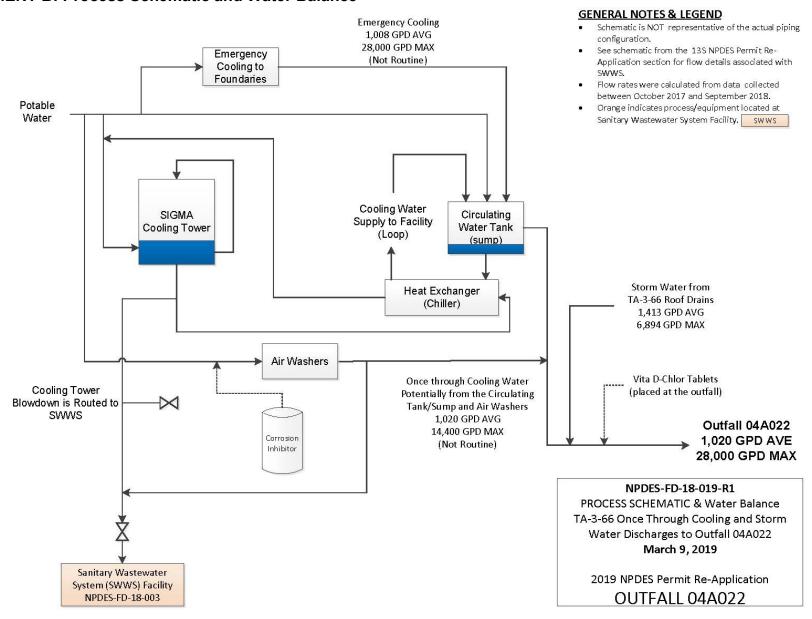
EPA ID No. NM0890010515

ATTACHMENT A: Location Map for Outfall 04A022





ATTACHMENT B: Process Schematic and Water Balance





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EPA ID No. NM0890010515

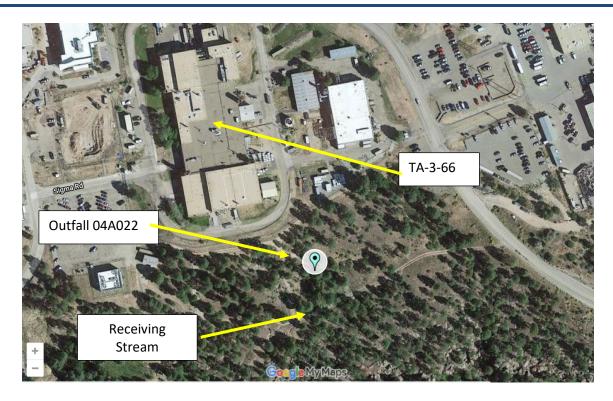
ATTACHMENT C: Photographs

Photograph ID No.	Photograph Title
NPDES-04A022-18-001	Outfall 04A022 - Location
NPDES-04A022-18-002	Outfall 04A022 - Discharge Location
NPDES-04A022-18-003	Outfall 04A022 - Receiving Stream Ephemeral Reach of Mortandad Canyon, Water Quality Segment Number 20.6.4.128 NMAC
NPDES-04A022-18-004	Outfall 04A022 - Heat Exchanger in TA-3-66 Basement
NPDES-04A022-18-005	Outfall 04A022 - Cooling Water Reservior/Sump in TA-3-66 Basement
NPDES-04A022-18-006	Outfall 04A022 - Chemical Treatment for Heat Exchanger/Cooling System at TA-3-66
NPDES-04A022-18-007	Outfall 04A022 - Roof Drains that Discharge to the Outfall
NPDES-04A022-18-008	Outfall 04A022 - Air Washers at TA-3-66
NPDES-04A022-18-009	Outfall 04A022 - Overflow Piping from Air Washers at TA-3-66
NPDES-04A022-18-0010	Outfall 04A022 - Chemical Treatment at Air Washers
NPDES-04A022-18-0011	Outfall 04A022 - De-Chlorination Tablets Located at the Outfall



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Photograph - NPDES-04A022-18-001 Outfall 04A022 - Location



Photograph - NPDES-04A022-18-002 Outfall 04A022 Discharge Location





Photograph - NPDES-04A022-18-003
Outfall 04A022 - Receiving Stream Ephemeral Reach of Mortandad Canyon,
Water Quality Segment Number 20.6.4.128 NMAC



Photograph - NPDES-04A022-18-004
Outfall 04A022 - Heat Exchanger in TA-3-66 Basement





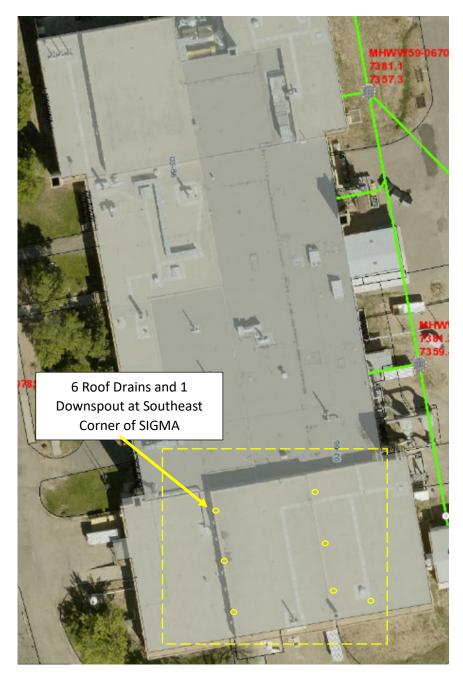


Photograph - NPDES-04A022-18-005
Outfall 04A022 - Cooling Water Reservior/Sump in TA-3-66 Basement



Photograph - NPDES-04A022-18-006
Outfall 04A022 Chemical Treatment for Heat Exchanger/Cooling System at TA-3-66





Photograph - NPDES-04A022-18-007
Outfall 04A022 - Roof Drains that Discharge to the Outfall
(Reference Characterization Report No. 53)





Photograph - NPDES-04A022-18-008
Outfall 04A022 - Air Washers at TA-3-66
(Reference July 2018 Flows Observed When System was Set to Sustain Instead of Demand)



Photograph - NPDES-04A022-18-009
Outfall 04A022 - Overflow Piping from Air Washers at TA-3-66
(Reference July 2018 Flows Observed When System was Set to Sustain Instead of Demand)





Photograph - NPDES-04A022-18-010
Outfall 04A022 - Chemical Treatment at Air Washers



Photograph - NPDES-04A022-18-011
Outfall 04A022 - De-Chlorination Tablets Located at the Outfall

ATTACHMENT D: Summary Discharge Monitoring Report October 2014 – September 2018

					Quantity o	r Loading		Quality or Concentration									
OUTFALL			Monitoring		Quantity 5			Quality of						Number of			
No.	Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples		Notes	
04A022	TA3-66	2014	Oct	Flow (Totalized Est.)	0.000123	0.000130	MGD							31	Daily	Required by Permit	
04A022	TA3-66	2014	Nov	Flow (Totalized Est.)	0.000089	0.000101	MGD							30	Daily	Required by Permit	
04A022	TA3-66	2014	Dec	Flow (Totalized Est.)	0.000214	0.003600	MGD							31	Daily	Required by Permit	
04A022	TA3-66	2015	Jan	Flow (Totalized Est.)	0.000101	0.000101	MGD							31	Daily	Required by Permit	
04A022	TA3-66	2015	Feb	Flow (Totalized Est.)	0.000101	0.000101	MGD							28	Daily	Required by Permit	
04A022	TA3-66	2015	Mar	Flow (Totalized Est.)	0.000101	0.000101	MGD							31	Daily	Required by Permit	
04A022	TA3-66	2015	Apr	Flow (Totalized Est.)	0.000101	0.000101	MGD							30	Daily	Required by Permit	
04A022	TA3-66	2015	May	Flow (Totalized Est.)	0.005598	0.017280	MGD							25	Daily	Required by Permit	
04A022	TA3-66	2015	Jun	Flow (Totalized Est.)	0.032832	0.043200	MGD							10	Daily	Required by Permit	
04A022	TA3-66	2015	Jul	Flow (Totalized Est.)	0.021600	0.028800	MGD							2	Daily	Required by Permit	
04A022	TA3-66	2015	Aug	Flow (Totalized Est.)	0.007200	0.007200	MGD							1	Daily	Required by Permit	
04A022	TA3-66	2015	Sept	Flow (Totalized Est.)	****	****	MGD							0	Daily	Required by Permit	
04A022	TA3-66	2015	Oct	Flow (Totalized Est.)	0.012000	0.012000	MGD							1	Daily	Required by Permit	
04A022	TA3-66	2015	Nov	Flow (Totalized Est.)	0.000645	0.000720	MGD							2	Daily	Required by Permit	
04A022	TA3-66	2015	Dec	Flow (Totalized Est.)	0.001014	0.001440	MGD							24	Daily	Required by Permit	
04A022	TA3-66	2016	Jan	Flow (Totalized Est.)	0.000892	0.001440	MGD							31	Daily	Required by Permit	
04A022	TA3-66	2016	Feb	Flow (Totalized Est.)	0.000819	0.001440	MGD							29	Daily	Required by Permit	
04A022	TA3-66	2016	Mar	Flow (Totalized Est.)	0.000790	0.001008	MGD							31	Daily	Required by Permit	
04A022	TA3-66	2016	Apr	Flow (Totalized Est.)	0.000758	0.001008	MGD							30	Daily	Required by Permit	
04A022	TA3-66	2016	May	Flow (Totalized Est.)	0.000720	0.000720	MGD							31	Daily	Required by Permit	
04A022	TA3-66	2016	Jun	Flow (Totalized Est.)	0.000588	0.000720	MGD							30	Daily	Required by Permit	
04A022	TA3-66		Jul	Flow (Totalized Est.)	0.000564	0.000700	MGD							31	Daily	Required by Permit	
04A022	TA3-66	2016	Aug	Flow (Totalized Est.)	0.000581	0.000720	MGD							31	Daily	Required by Permit	
04A022	TA3-66	2016	Sept	Flow (Totalized Est.)	0.000720	0.000720	MGD							30	Daily	Required by Permit	
04A022	TA3-66	2016	Oct	Flow (Totalized Est.)	0.000720	0.000720	MGD							31	Daily	Required by Permit	
04A022	TA3-66	2016		Flow (Totalized Est.)	0.000720		MGD							30	Daily	Required by Permit	
04A022	TA3-66	+		Flow (Totalized Est.)	0.000720	0.000720	MGD							31	Daily	Required by Permit	
04A022	TA3-66		Jan	Flow (Totalized Est.)	0.000720	0.000720	MGD							31	Daily	Required by Permit	
04A022	TA3-66	2017	Feb	Flow (Totalized Est.)	0.003559	0.005760	MGD							28	Daily	Required by Permit	
04A022	TA3-66	2017	Mar	Flow (Totalized Est.)	0.000720	0.000720	MGD							31	Daily	Required by Permit	
04A022	TA3-66	2017	Apr	Flow (Totalized Est.)	0.000720	0.000720	MGD							30	Daily	Required by Permit	
04A022	TA3-66	2017	May	Flow (Totalized Est.)	0.000720	0.000720	MGD							31	Daily	Required by Permit	
04A022	TA3-66	2017	Jun	Flow (Totalized Est.)	0.000720	0.000720	MGD							30	Daily	Required by Permit	
04A022	TA3-66	2017	Jul	Flow (Totalized Est.)	0.000720	0.000720	MGD							31	Daily	Required by Permit	
04A022	TA3-66	2017	Aug	Flow (Totalized Est.)	0.000720	0.000720	MGD							31	Daily	Required by Permit	
04A022	TA3-66	+	Sept	Flow (Totalized Est.)	0.005400	0.028800	MGD							30	Daily	Required by Permit	
04A022	TA3-66	2017	Oct	Flow (Totalized Est.)	0.000720	0.000720	MGD							31	Daily	Required by Permit	
04A022	TA3-66	+	Nov	Flow (Totalized Est.)	0.000720	0.000720	MGD							30	Daily	Required by Permit	



Quantity or Loading							Quality or C	`ancontration								
					Quantity of	Loading		Quality or C	Concentration							
OUTFALL	TA -		Monitoring											Number		
No.	Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	of Samples	Frequency	Notes
04A022	TA3-66	2017	Dec	Flow (Totalized Est.)	0.000720	0.000720	MGD	IVIIIIII	Average	Widaiiidiii	Offics	T CITITE LITTLE	Onics	31	Daily	Required by Permit
04A022	TA3-66		Jan	Flow (Totalized Est.)	0.000720	0.000720	MGD							31	Daily	Required by Permit
04A022	TA3-66	2018	Feb	Flow (Totalized Est.)	0.000720	0.000720	MGD							28	Daily	Required by Permit
04A022	TA3-66	2018	Mar	Flow (Totalized Est.)	0.000720	0.000720	MGD							31	Daily	Required by Permit
04A022	TA3-66	2018	Apr	Flow (Totalized Est.)	0.000720	0.000720	MGD							30	Daily	Required by Permit
04A022	TA3-66	2018	May	Flow (Totalized Est.)	0.000720	0.000720	MGD							31	Daily	Required by Permit
04A022	TA3-66	2018	Jun	Flow (Totalized Est.)	0.000720	0.000720	MGD							30	Daily	Required by Permit
04A022	TA3-66	2018	Jul	Flow (Totalized Est.)	0.004250	0.014400	MGD							31	Daily	Required by Permit
04A022	TA3-66	2018	Aug	Flow (Totalized Est.)	0.000720	0.000072	MGD							31	Daily	Required by Permit
04A022	TA3-66	2018	_	Flow (Totalized Est.)	0.000720	0.000720	MGD							30	Daily	Required by Permit
	L	<u> </u>	•	Flow (Totalized Est.)		Daily	/ Average		0.001272					1,281	•	, , ,
				Flow (Totalized Est.)	Maxi	imum 30 Day			0.032832					1,281		
				Flow (Totalized Est.)		Daily N	/laximum			0.043200				1,281		
04A022	TA3-66	2014	Oct	рН				7.8	****	8.0	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Required by Permit
04A022	TA3-66	2014	Nov	pH				7.8	****	8.1	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2014	Dec	рН				7.4	****	8.0	S.U.	6.0 - 9.0	S.U.	6.0	Weekly	Required by Permit
04A022	TA3-66	2015	Jan	рН				7.9	****	8.1	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2015	Feb	рН				7.9	****	8.0	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2015	Mar	рН				7.9	****	8.1	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Required by Permit
04A022	TA3-66	2015	Apr	рН				8.1	***	8.2	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2015	May	рН				7.6	****	8.1	S.U.	6.0 - 9.0	S.U.	3.0	Weekly	Required by Permit
04A022	TA3-66	2015	Jun	рН				7.4	****	7.7	S.U.	6.0 - 9.0	S.U.	3.0	Weekly	Required by Permit
04A022	TA3-66	2015	Jul	рH				7.5	****	7.6	S.U.	6.0 - 9.0	S.U.	2.0	Weekly	Required by Permit
04A022	TA3-66	2015	Aug	рH				7.4	****	7.4	S.U.	6.0 - 9.0	S.U.	1.0	Weekly	Required by Permit
04A022	TA3-66	2015	Sept	рН				****	****	****	S.U.	6.0 - 9.0	S.U.	0.0	Weekly	Required by Permit
04A022	TA3-66	2015	Oct	рН				7.2	****	7.2	S.U.	6.0 - 9.0	S.U.	1.0	Weekly	Required by Permit
04A022	TA3-66	2015	Nov	pH				7.7	****	8.0	S.U.	6.0 - 9.0	S.U.	2.0	Weekly	Required by Permit
04A022	TA3-66	2015	Dec	pH				7.9	****	8.1	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2016	Jan	pH				8.0	****	8.1	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2016	Feb	pH				8.1	***	8.1	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2016	Mar	рH				8.0	****	8.2	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Required by Permit
04A022	TA3-66	2016	Apr	рH				7.6	****	8.1	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2016	May	рH				7.8	****	8.1	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Required by Permit
04A022	TA3-66	2016	Jun	рН				8.0	****	8.1	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2016	Jul	рН				7.8	****	8.1	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Required by Permit
04A022	TA3-66	2016	Aug	рН				7.8	****	8.2	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2016	Sept	рН				7.8	****	8.2	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2016	Oct	рН				8.0	****	8.1	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2016	Nov	рН				7.9	****	8.1	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Required by Permit
04A022	TA3-66	2016	Dec	рН				8.0	****	8.1	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit



Quantity or Loading							Quality or (Concentration								
					, , .									Number		
OUTFALL	TA -		Monitoring											of		
No.	Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency	Notes
04A022	TA3-66	2017	Jan	рH				7.9	****	8.0	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2017	Feb	рH				7.7	****	8.2	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2017	Mar	рH				7.8	****	8.1	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Required by Permit
04A022	TA3-66	2017	Apr	pH				7.9	****	7.9	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2017	May	pH				7.7	****	8.0	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Required by Permit
04A022	TA3-66	2017	Jun	рH				7.8	****	7.9	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2017	Jul	pH				7.7	****	8.0	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2017	Aug	pH				8.0	****	8.1	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Required by Permit
04A022	TA3-66	2017	Sept	рH				7.0	****	8.2	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2017	Oct	pH				8.1	****	8.2	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Required by Permit
04A022	TA3-66	2017	Nov	рH				7.4	****	8.1	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2017	Dec	pH				7.8	****	8.0	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2018	Jan	рH				7.5	****	8.0	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Required by Permit
04A022	TA3-66	2018	Feb	рH				7.6	****	7.9	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2018	Mar	рH				7.7	***	7.9	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2018	Apr	рH				7.4	***	8.0	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2018	May	рH				7.5	***	7.8	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Required by Permit
04A022	TA3-66	2018	Jun	рH				7.3	***	7.9	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2018	Jul	рH				7.8	***	7.9	S.U.	6.0 - 9.0	S.U.	5.0	Weekly	Required by Permit
04A022	TA3-66	2018	Aug	рН				7.3	***	7.8	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
04A022	TA3-66	2018	Sept	рH				7.6	***	7.6	S.U.	6.0 - 9.0	S.U.	4.0	Weekly	Required by Permit
				рН		Daily I	Minimum	7						191		
				рН	Max	cimum 30 Day	Average		8.16					191		
				рН		Daily N	Maximum			8.2				191		
04A022	TA3-66	2014		Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	5	Weekly	Required by Permit
04A022	TA3-66	2014	Nov	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4	Weekly	Required by Permit
04A022	TA3-66	2014	Dec	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	6	Weekly	Required by Permit
04A022	TA3-66	2015	Jan	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4	Weekly	Required by Permit
04A022	TA3-66	2015	Feb	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4	Weekly	Required by Permit
04A022	TA3-66	2015	Mar	Total Residual Chlorine				****	***	0	mg/L	0.011	mg/L	5	Weekly	Required by Permit
04A022	TA3-66	2015	Apr	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	4	Weekly	Required by Permit
04A022	TA3-66	2015	May	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	3	Weekly	Required by Permit
04A022	TA3-66	2015	Jun	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	3	Weekly	Required by Permit
04A022	TA3-66	2015	Jul	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	2	Weekly	Required by Permit
04A022	TA3-66	2015	Aug	Total Residual Chlorine				****	****	0	mg/L	0.011	mg/L	1	Weekly	Required by Permit
04A022	TA3-66	2015	Sept	Total Residual Chlorine				****	****	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2015	Oct	Total Residual Chlorine				****	****	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2015	Nov	Total Residual Chlorine				****	****	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2015	Dec	Total Residual Chlorine				****	****	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2016	Jan	Total Residual Chlorine				****	****	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit





					Quantity or Loading Quality o				Concentration							
					, , , , , ,									Number		
OUTFALL	TA -		Monitoring											of		
No.	Bldg.	Year	Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Samples	Frequency	Notes
04A022	TA3-66	2016	Feb	Total Residual Chlorine				****	****	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2016	Mar	Total Residual Chlorine				****	****	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2016	Apr	Total Residual Chlorine				***	***	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2016	May	Total Residual Chlorine				****	***	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2016	Jun	Total Residual Chlorine				****	****	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2016	Jul	Total Residual Chlorine				****	****	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2016	Aug	Total Residual Chlorine				****	****	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2016	Sept	Total Residual Chlorine				****	****	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2016	Oct	Total Residual Chlorine				****	****	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2016	Nov	Total Residual Chlorine				****	****	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2016	Dec	Total Residual Chlorine				****	****	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2017	Jan	Total Residual Chlorine				****	****	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2017	Feb	Total Residual Chlorine				****	****	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2017	Mar	Total Residual Chlorine				****	****	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2017	Apr	Total Residual Chlorine				****	****	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2017	May	Total Residual Chlorine				****	****	***	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2017	Jun	Total Residual Chlorine				****	****	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2017	Jul	Total Residual Chlorine				****	***	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2017	Aug	Total Residual Chlorine				****	***	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2017	Sept	Total Residual Chlorine				****	***	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2017	Oct	Total Residual Chlorine				****	***	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2017	Nov	Total Residual Chlorine				***	***	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2017	Dec	Total Residual Chlorine				***	***	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2018	Jan	Total Residual Chlorine				***	***	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2018	Feb	Total Residual Chlorine				***	***	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2018	Mar	Total Residual Chlorine				***	***	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2018	Apr	Total Residual Chlorine				***	***	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2018	May	Total Residual Chlorine				****	***	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2018	Jun	Total Residual Chlorine				****	***	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2018	Jul	Total Residual Chlorine				****	***	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2018	Aug	Total Residual Chlorine				****	***	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
04A022	TA3-66	2018	Sept	Total Residual Chlorine				****	***	****	mg/L	0.011	mg/L	0	Weekly	Required by Permit
				Total Residual Chlorine		Daily	/ Average		0					41		
				Total Residual Chlorine	Max	imum 30 Day	Average		0					41		
				Total Residual Chlorine		Daily N	Naximum			0				41		
04A022	TA3-66	2014	Dec	Total Suspended Solids				****	1.2	1.2	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit
04A022	TA3-66	2015	Mar	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit
04A022	TA3-66	2015	Jun	Total Suspended Solids				****	0.9	0.9	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit
04A022	TA3-66	2015	Sept	Total Suspended Solids				****	1.1	1.1	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit
04A022	TA3-66	2015	Dec	Total Suspended Solids				****	<0.885	1.2	mg/L	30 - 100	mg/L	2	Quarterly	Required by Permit



			Quantity or Loading					Quality or Concentration									
OUTFALL No.	TA - Bldg.	Year	Monitoring Period	Parameter	Average	Maximum	Units	Minimum	Average	Maximum	Units	Permit Limit	Units	Number of Samples	Frequency	Notes	
04A022	TA3-66	2016	Mar	Total Suspended Solids	2.0			****	1.8	1.8	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit	
04A022	TA3-66	2016	Jun	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit	
04A022 04A022	TA3-66	2016 2016	Sept Dec	Total Suspended Solids Total Suspended Solids				****	<5.7 <0.826	<5.7 <0.826	mg/L mg/L	30 - 100 30 - 100	mg/L mg/L	1	Quarterly Quarterly	Required by Permit Required by Permit	
04A022	TA3-66	2017	Mar	Total Suspended Solids				****	13.4	13.4	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit	
04A022	TA3-66	2017	Jun	Total Suspended Solids				****	4.22	4.22	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit	
04A022	TA3-66	2017	Sept	Total Suspended Solids				****	<0.604	<0.638	mg/L	30 - 100	mg/L	2	Quarterly	Required by Permit	
04A022	TA3-66	2017	Dec	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit	
04A022	TA3-66	2018	Mar	Total Suspended Solids				****			mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit	
04A022	TA3-66	2018	Jun	Total Suspended Solids				****	2.8	2.8	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit	
04A022	TA3-66	2018	Sept	Total Suspended Solids				****	<0.57	<0.57	mg/L	30 - 100	mg/L	1	Quarterly	Required by Permit	
				Total Suspended Solids		Daily	/ Average		3.6					18			
				Total Suspended Solids	Max	imum 30 Day	Average		13.4					18			
	Total Suspended Solids				Daily N	Maximum			13.4				18				
04A022	TA3-66	2016	Sept	Aluminum, Total				****	<0.015	<0.015	mg/L	NA	NA	1	Term	Required by Permit	
				Aluminum, Total			/ Average	+						1			
				Aluminum, Total	Max	imum 30 Day			0					1			
	1	1		Aluminum, Total		Daily N	Naximum			0				1			
04A022	TA3-66	2015	Sept	Copper, Dissolved				****	0.01310	0.01310	mg/L	NA	NA	1	Term	Required by Permit	
04A022	TA3-66	2016	Sept	Copper, Dissolved				****	****	****	mg/L	NA	NA	0	Term	NA	
04A022	TA3-66	2017	Sept	Copper, Dissolved				****	0.05650	0.10000	mg/L	NA	NA	2	Term	NA	
04A022	TA3-66	2018	Sept	Copper, Dissolved				****	****	****	mg/L	NA	NA	0	Term	NA	
				Copper, Dissolved			Average		0.0348					0			
	Copper, Dissolved			• • •	Max	imum 30 Day			0.05650	0.40000				0			
04A022	TA3-66	2016	Cont	Cross Alpha		Daily	/laximum	***	0	0.10000	pCi/L	NA	NA	0	Term	Required by Dormit	
U4AUZZ	1 A3-00	2016	sept	Gross Alpha Gross Alpha		Daile	/ Average		U	U	pci/L	INA	INA	1 1	renn	Required by Permit	
				Gross Alpha	May	timum 30 Day			0					1			
				Gross Alpha	IVIdX		Maximum		U	0				1			
				GIUSS AIPIIA		Daily	viaxiiiiuiii			U				1			

ATTACHMENT E: Safety Data Sheets

List of Safety Data Sheets
Formula 211
Formula 314-T
Vita-D-Chlor Tablets
Bright Dyes FLT Yellow/Green Liquid
Bright Dyes FLT Yellow/Green Tablet



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FORMULA 2011



MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI, Canadian WHMIS Standards, Australian WorkSafe, Japanese Industrial Standard JIS Z 7250:2000, and European Directives

SECTION I - PRODUCT IDENTIFICATION

Product Name:

FORMULA 2011

Product Use:

COOLING WATER TREATMENT

UN NUMBER:

Not applicable

U.N. DANGEROUS GOOD CLASS/SUBSIDIARY RISK:

Not applicable

MANUFACTURER'S NAME: ADDRESS:

Garratt-Callahan Company

EMERGENCY PHONE:

50 Ingold Road, Burlingame, CA 94010-2206

North America: CHEMTREC: 1-800-424-9300 Outside North America: +1-703-527-3887

BUSINESS PHONE:

Product Information: 650-697-5811

MSDS Number:

SD2011 2/22/2011

DATE OF REVISION:

SECTION 2 - HAZARDS IDENTIFICATION

EU LABELING AND CLASSIFICATION: Components of this product have not been classified as defined by the European Economic Community Guidelines (EECC). This product has not been classified by the EECC.

EU CLASSIFICATION: Not classified.

EU RISK PHRASES: Not classified.

EU SAFETY PHRASES: Not classified.

DANGER! THIS PRODUCT IS A NON-FLAMMABLE, CLEAR LIGHT YELLOW LIQUID WITH SLIGHT ORGANIC ODOR. MAY CAUSE EYE AND SKIN IRRITATION. MAY CAUSE RESPIRATORY TRACT IRRITATION.

HEALTH EFFECTS AND RISKS FROM EXPOSURE:

ACUTE: Contact with skin and eyes will cause burning and irritation. Do not wear contact lenses when using this product. Ingestion will cause gastric distress and possible depression of the central nervous system.

CHRONIC: Repeated or prolonged exposure to this product can produce target organ damage. Repeated exposure of the eyes can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation can produce varying degrees of respiratory irritation or lung damage.

TARGET ORGANS:

ACUTE: Skin, eyes, respiratory system.

CHRONIC: Skin, respiratory system

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH HAZARD (BLUE)	Ī
FLAMMABILITY HAZARD (RED)	0
REACTIVITY HAZARD (YELLOW)	0

Hazard Scale 0=Minimal I=Slight

2=Moderate 3=Serious 4=Severe



WATER TREATMENT EXPERTISE SINCE 1904

FORMULA 2011

www.g-c.com

Page I of 5

SECTION 3 - COMPOSITION	SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS									
Hazardous Ingredients	CAS#	HAZARDOUS	EC#	ICSC#	WT %	Classification; Risk Phrases				
PHOSPHONOBUTANE TRICARBOXYLIC ACID	37971-36-1	YES	253-733-5	NE	< 5	Not classified				
monosodium phosphate	7558-80-7	YES	231-449-2	NE	< 5	Not classified				
BENZOTRIAZOLE	95-14-7	YES	202-394-1	1091	< 3	Not classified				
PHOSPHINOCARBOXYLIC ACID	71050-62-9	YES	NE	NE	1	Not classified				

NOTE: ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.I-2004 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR, EU Directives and the Japanese Industrial Standard JIS Z 7250: 2000. See Section 2 for full text of Risk Phrases and Safety Phrases.

SECTION 4 - FIRST AID MEASURES

Exposed individuals must be taken for medical attention if any adverse effect occurs. Take a copy of this MSDS to the health professional with the

SKIN EXPOSURE: If this product contaminates the skin, begin decontamination with running water and soap. Minimum flushing time is for 15 minutes. Remove exposed or contaminated clothing, taking care not to contaminate the eyes. The exposed individual must seek medical attention if

EYE EXPOSURE: If vapors, mists, or sprays are generated by this product and enter the eyes, open the exposed individual's eyes while under gently running water. Use sufficient force to open the eyelids. Have the exposed individual "roll" their eyes. Minimum flushing time is for 15 minutes. The exposed individual must seek immediate medical attention.

INHALATION: If vapors, mists, or sprays generated by this product are inhaled, remove exposed individual to fresh air. Remove or cover gross contamination to avoid exposure to rescuers.

INGESTION: Routine use of this product is not expected to cause any situation which could lead to ingestion. If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT ASSISTANCE INFORMATION. Exposed individual must seek immediate medical attention. Never induce vomiting or give diluents (milk or water) by mouth to someone who is unconscious, having convulsions, or unable to

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Skin and respiratory disorders, as well as conditions involving the "Target Organs" (see Section 2, Hazard Identification) which may be aggravated by prolonged exposures to this product. Exposed individual must seek immediate medical attention if any adverse effect occurs.

NOTES TO PHYSICIAN: Treat symptomatically. Treat symptoms as demonstrated by signs and distress in the patient.

SECTION 5 - FIRE FIGHTING MEASURES

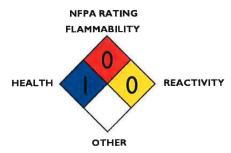
FIRE EXTINGUISHING MATERIALS:

Use media appropriate for the surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: No unusual hazards.

SPECIAL FIRE-FIGHTING PROCEDURES:

In case of fire wear full positive-pressure self-contained breathing apparatus and protective suit.



WATER TREATMENT EXPERTISE SINCE 1904

www.g-c.com FORMULA 2011

Page 2 of 5

SECTION 6 - ACCIDENTAL RELEASE MEASURES

WARNING: Any container expansion or rounding indicates pressure build-up. Use extreme caution. When opening, release pressure slowly through opening.

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by appropriately trained personnel using pre-planned procedures. Proper protective equipment should be used.

Small Spill: Mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Restrict access to the area. Provide adequate protective equipment and ventilation. Stop leak if without risk. Remove chemicals which can react with the spilled material. Add dry inert material to contain and absorb spilled material. Prevent entry into surface waters, sewers, basements or confined areas, dike if needed. Ensure that exposure to product is not at a concentration exceeding regulatory limits. Decontaminate the area thoroughly. Decontaminate all response equipment with soapy water before returning to service. Place all spill residue in a suitable container and seal. Dispose of in accordance with U.S. Federal, State, and local hazardous waste disposal regulations, those of Canada and its Provinces, those of Australia, Japan and EU Member States (see Section 13, Disposal Considerations), as appropriate.

SECTION 7 - HANDLING AND STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat, drink, smoke, or apply cosmetics while handling this product. Avoid breathing vapors or mists generated by this product. Use in a well-ventilated location. Remove contaminated clothing immediately.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Open containers slowly on a stable surface. Containers of this product must be properly labeled. Storage areas of this product should be clearly identified, well-illuminated, clear of obstruction and accessible only to trained and authorized personnel. Store containers in a cool, dry location, away from direct sunlight, at temperatures between 50°F - 100°F. Keep container tightly closed when not in use.

SECTION 8 - EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation. Ensure eyewash/safety shower station is available near where this product is used.

EXPOSURE LIMITS/GUIDELINES:

	SURE LIMITS IN AIR	
SIH TLV	OSHA PEL	0

CHEMICAL NAME	CAS#	ACGII TWA	STEL	OSHA PEL TWA	OTHER
PHOSPHONOBUTANE TRICARBOXYLIC ACID	37971-36-1	NE	NE	NE	NONE
MONOSODIUM PHOSPHATE	7558-80-7	NE	NE	NE	NONE
BENZOTRIAZOLE	95-14-7	NE	NE	NE	NONE
PHOSPHINOCARBOXYLIC ACID	71050-62-9	NE	NE	NE	NONE

NE = Not Established

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132 and 1910.138) or equivalent standard of Canada, European Standard DIN EN 374, Australian Standards, relevant Japanese Standards, or EU member states (including EN 149 for respiratory PPE, and EN 166 for face/eye protection). If necessary, refer to appropriate Standards of Canada, EU, Australia, or Japan.

RESPIRATORY PROTECTION: Maintain airborne contaminant concentrations below guidelines listed above, if applicable. If necessary, use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), equivalent U.S. State standards, Canadian CSA Standard Z94.4-93, the European Standard EN149, or EU member states. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under U.S. Federal OSHA's Respiratory Protection Standard (1910.134-1998) or the regulations of various U.S. States, Canada, EU Member States, or those of Japan. Air-purifying respirators with dust/mist/fume filters are recommended if operations may produce mists or sprays from this product.

EYE PROTECTION: Chemical safety goggles. A face shield may also be necessary. If necessary, refer to U.S. OSHA 29 CFR 1910.133, Canadian Standards, and the European Standard EN 166, Australian Standards, or relevant Japanese Standards.

SKIN PROTECTION: Use chemically-resistant, such as Butyl rubber, Nitrile or polyvinyl alcohol gloves when handling this product. If necessary, refer to U.S. OSHA 29 CFR 1910.138, the European Standard DIN EN 374, the appropriate Standards of Canada, Australian Standards, or relevant Japanese Standards. Use body protection appropriate for task (e.g. lab coat, overalls).

WATER TREATMENT EXPERTISE SINCE 1904

FORMULA 2011

www.g-c.com

Page 3 of 5

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE and COLOR: Clear light yellow liquid

Slight Organic ODOR:

VAPOR DENSITY (Air=10):

Not determined Not determined

MELTING/FREEZING POINT:

SPECIFIC GRAVITY@20°C (water=1): 2.0 - 4.0SOLUBILITY IN WATER: > 212 °F (100 °C) PARTITION COEFFICIENT (n-octanol/water) Not established

1.04 - 1.06 Complete

BOILING POINT: FLASHPOINT: EVAPORATION RATE (n-BuAc=1):

Non-flammable Not established

NA

AUTOIGNITION TEMPERATURE: DECOMPOSITION TEMPERATURE:

VAPOR PRESSURE, mm Hg @ 20°C :

Not established Not established

FLAMMABLE LIMITS (in air by volume, %): Not established

VISCOSITY:

Not established

SECTION 10 - STABILITY AND REACTIVITY

REACTIVITY: Not established

STABILITY: Stable

HAZARDOUS DECOMPOSITION: When heated to decomposition, product may emit toxic fumes of oxides of carbon, nitrogen, phosphorous and

HAZARDOUS POLYMERIZATION: Will not occur.

INCOMPATIBLE MATERIALS: Bases CONDITIONS TO AVOID: None known

SECTION 11 - TOXICOLOGICAL INFORMATION

SUSPECTED CANCER AGENT: The components of this product are not found on the following lists: FEDERAL OSHA Z. LIST, NTP, IARC, or CAL/OSHA and therefore are not considered to be, nor suspected to be, cancer-causing agents by these agencies.

BIOLOGICAL EXPOSURE INDICES: Currently, Biological Exposure Indices (BEIs) have not been determined for the components of this product.

SECTION 12 - ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: The components of this product will slowly degrade under ambient environmental conditions to other organic compounds. The following information is available for the main components of this product.

ECOLOGICAL DATA:

Fish: Flathead Minnow, LC50, 5359 ppm

Algae: No data available

Water Flea, LC50, Daphnia magna, 7071 ppm

BOD5 and COD: Material not expected to bioaccumulate.

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL: Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations, those of Canada, Australia, EU Member States and/or Japan, as appropriate.

SECTION 14 - TRANSPORTATION INFORMATION

US DOT - NOT REGULATED ICAO/IATA - NOT REGULATED IMO/IMDG - NOT REGULATED

> WATER TREATMENT EXPERTISE SINCE 1904 www.g-c.com

FORMULA 2011

Page 4 of 5

SECTION 15 - REGULATORY INFORMATION

United States and International Regulations

United States Regulations: U.S. SARA REPORTING REQUIREMENTS: The components of this product are subject to the reporting requirements of Sections 302, 304, and 313 of Title of the Superfund Amendments and Reauthorization Act, listed below:

CHEMICAL NAME

PHOSPHONOBUTANE

SARA 302 (40 CFR 355, Appendix A) - NO

TRICARBOXYLIC ACID

SARA 304 (40 CFR Table 302.4) - NO SARA 313 (40 CFR 372.65) - NO

MONOSODIUM PHOSPHATE

SARA 302 (40 CFR 355, Appendix A) - NO

SARA 304 (40 CFR Table 302.4) - NO

SARA 313 (40 CFR 372.65) - NO

BENZOTRIAZOLE

SARA 302 (40 CFR 355, Appendix A) - NO

SARA 304 (40 CFR Table 302.4) - NO

SARA 313 (40 CFR 372.65) - NO

PHOSPHINOCARBOXYLIC ACID

SARA 302 (40 CFR 355, Appendix A) - NO

SARA 304 (40 CFR Table 302.4) - NO SARA 313 (40 CFR 372.65) - NO

U.S. Regulations

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for the components of this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs (4,540 kg) therefore applies, per 40 CFR 370.20.U.S. CERCLA REPORTABLE QUANTITY (RQ): None

U.S. TSCA INVENTORY STATUS: The components of this product are listed on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS:

SARA Title 311/312, Hazard Category: Acute Health: NO; Chronic: YES; Fire: NO; Reactive: NO; Sudden Release of Pressure: NO

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No component of this product is on the Proposition 65 List.

International Regulations

CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: The components of this product are on the DSL or NDSL Inventories CANADIAN WHMIS CLASSIFICATION: Not classified.

This material or its components are listed (or considered as having been notified) on the European Inventory of Existing Chemical Substances

Other Inventory Lists:, Korea (TCCL), Australia (AISC), China (Draft), PICCS (Philippines-RA6969), Japan (ENCS METI/MOL).

SECTION 16 - OTHER INFORMATION

PREPARED BY: Garratt Callahan

Revision Date: February 22, 2011

Supercedes: June 6, 2008

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purpose or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose.

WATER TREATMENT EXPERTISE SINCE 1904

FORMULA 2011

www.g-c.com

Page 5 of 5

FORMULA 314 T





MATERIAL SAFETY DATA SHEET

SECTION I - PRODUCT IDENTIFICATION

PRODUCT NAME: FORMULA 314-T
PRODUCT USE: BIOCIDE
UN NUMBER: 1479

PROPER SHIPPING NAME: OXIDIZING SOLID, N.O.S., 5.1, PGII, (I-BROMO-3-CHLORO-5,5-

DIMETHYLHYDANTOIN)

MANUFACTURER'S NAME: Garratt-Callahan Company

ADDRESS: 50 Ingold Road, Burlingame, CA 94010-2206
EMERGENCY PHONE: North America: CHEMTREC: 1-800-424

North America: CHEMTREC: I-800-424-9300
Outside North America: +1-703-527-3887

BUSINESS PHONE: Product Information: 650-697-5811

MSDS NUMBER: SD3314
DATE OF REVISION: 3/6/2012

SECTION 2 - HAZARDS IDENTIFICATION

OXIDIZING SOLID, N.O.S. (I-BROMO-3-CHLORO-5,5-DIMETHYLHYDANTOIN), 5.1, PGII

EU LABELING AND CLASSIFICATION: This product meets the definition of the following hazard class as defined by the European Economic Community Guidelines.

EU CLASSIFICATION: [Xn] Harmful; [C] Corrosive

EU RISK PHRASES: R8: Contact with combustible material may cause fire; R31: Contact with acids liberates toxic gas; R34: Causes burns.

EU SAFETY PHRASES: S8: Keep container dry; S17: Keep away from combustible materials; S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice; S36: Wear suitable protective clothing; S37: Wear suitable gloves; S39: Wear eye/face protection; S41: In case of fire and/or explosion do not breath fumes; S45: In case of accident or if you feel unwell, seek medical advice immediately.

DANGER! THIS PRODUCT IS A NON-FLAMMABLE, WHITE TO OFF-WHITE TABLET WITH A FAINT HALOGEN ODOR. MAY CAUSE EYE AND SKIN BURNS. HARMFUL IF INGESTED OR SWALLOWED. MAY CAUSE RESPIRATORY TRACT IRRITATION.

HEALTH EFFECTS AND RISKS FROM EXPOSURE:

ACUTE: Contact with skin and eyes will cause burning and irritation. Do not wear contact lenses when using this product. Ingestion will cause gastric distress and possible depression of the central nervous system.

CHRONIC: Repeated or prolonged exposure to this product can produce target organ damage. Repeated exposure of the eyes can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation can produce varying degrees of respiratory irritation or lung damage.

TARGET ORGANS:

ACUTE: Skin, eyes respiratory system.

CHRONIC: Skin, respiratory system

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH HAZARD (BLUE)	3
FLAMMABILITY HAZARD (RED)	0
REACTIVITY HAZARD (YELLOW)	T

Hazard Scale
0=Minimal
1=Slight
2=Moderate
3=Serious
4=Severe
*=Chronic hazard



WATER TREATMENT EXPERTISE SINCE 1904

FORMULA 314-T

www.g-c.com

Page 1 of 5

CECTIONIS	COMPOSITION/INFORMATION ON INGREDIENTS
ISECTION S -	COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Ingredients

CAS#
EC# ICSC# WT%
GHS Hazard Statement

I-BROMO-3-CHLORO-5,5-DIMETHYLHYDANTOIN

16079-88-2
240-230-0
NE
96%
HAZARD CLASSIFICATION:
[Xn] HARMFUL, [C] CORROSIVE
RISK PHRASES: R8, R31, R34

SECTION 4 - FIRST AID MEASURES

Exposed individuals must be taken for medical attention if any adverse effect occurs. Take a copy of this MSDS to the health professional with the individual.

SKIN EXPOSURE: If this product contaminates the skin, begin decontamination with running water and soap. Minimum flushing time is for 15 minutes. Remove exposed or contaminated clothing, taking care not to contaminate the eyes. The exposed individual must seek medical attention if any adverse effect occurs.

EYE EXPOSURE: If vapors, mists, or sprays are generated by this product and enter the eyes, open the exposed individual's eyes while under gently running water. Use sufficient force to open the eyelids. Have the exposed individual "roll" their eyes. Minimum flushing time is for 15 minutes. The exposed individual must seek immediate medical attention.

INHALATION: If vapors, mists, or sprays generated by this product are inhaled, remove exposed individual to fresh air. Remove or cover gross contamination to avoid exposure to rescuers.

INGESTION: Routine use of this product is not expected to cause any situation which could lead to ingestion. If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT ASSISTANCE INFORMATION. Exposed individual must seek immediate medical attention. Never induce vomiting or give diluents (milk or water) by mouth to someone who is unconscious, having convulsions, or unable to swallow.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Skin and respiratory disorders, as well as conditions involving the "Target Organs" (see Section 2, Hazards Identification) which may be aggravated by prolonged exposures to this product. Exposed individual must seek immediate medical attention if any adverse effect occurs,

NOTES TO PHYSICIAN: Treat symptomatically. Treat symptoms as demonstrated by signs and distress in the patient.

SECTION 5 - FIRE FIGHTING MEASURES

FIRE EXTINGUISHING MATERIALS: Water spray, fog or mist. Alcohol resistant foam. Do not use ammonium-phosphate (ABC), other

dry chemical extinguishers or CO2.

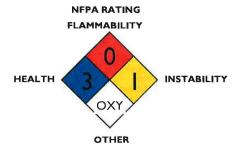
UNUSUAL FIRE AND EXPLOSION HAZARDS: Oxidizing material. Forms explosive mixtures with combustible organic or other easily oxidizable

materials. May release hydrogen bromide or bromine gas, nitrogen oxides, hydrogen chloride

when wet. Fire causes formation of toxic gases.

SPECIAL FIRE-FIGHTING PROCEDURES: Wear self-contained breathing apparatus and full protective gear. Keep run-off water out of

sewers and water sources. Dike for water control.



WATER TREATMENT EXPERTISE SINCE 1904

FORMULA 314-T www.g-c.com Page 2 of 5

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application

SECTION 6 - ACCIDENTAL RELEASE MEASURES

WARNING: Any drum expansion or rounding indicates pressure build-up. Use extreme caution. When opening, release pressure slowly through lifting edge of lid carefully.

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by appropriately trained personnel using pre-planned procedures. Proper protective equipment should be used.

Small Spill: Collect and place in an appropriate waste disposal container.

Large Spill: Non-flammable corrosive oxidizing solid. Restrict access to the area. Avoid contact with water. Provide adequate protective equipment and ventilation. Stop leak if without risk. Remove chemicals which can react with the spilled material. Use DRY earth sand or other non-combustible material to collect and dry product. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Prevent entry into surface waters, sewers, basements or confined areas, dike if needed. Decontaminate the area thoroughly. Decontaminate all response equipment with soapy water before returning to service. Place all spill residue in a suitable container and seal. Dispose of in accordance with U.S. Federal, State, and local hazardous waste disposal regulations, those of Canada and its Provinces, those of Australia, Japan and EU Member States (see Section 13, Disposal Considerations), as appropriate.

SECTION 7 - HANDLING AND STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat, drink, smoke, or apply cosmetics while handling this product. Avoid breathing vapors or mists generated by this product. Use in a well-ventilated location. Remove contaminated clothing immediately.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Open containers slowly on a stable surface. Containers of this product must be properly labeled. Storage areas of this product should be clearly identified, well-illuminated, clear of obstruction and accessible only to trained and authorized personnel. Store containers in a cool, dry location, away from direct sunlight, heat, sparks or open flame. Keep container tightly closed when not in use. Storage class: oxidizer storage.

SECTION 8 - EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation. Eyewash/safety shower station is recommended to be available near where this product is used.

EXPOSURE LIMITS/GUIDELINES:

E	ΧP	0	SUI	RE	LIN	11T:	S II	N.	ΑII	R

CHEMICAL NAME	CAS#	ACGII TWA		OSHA PEL TWA	OTHER
I-BROMO-3-CHLORO-5,5- DIMETHYL-HYDANTOIN	16079-88-2	NE	NE	NE	NONE

NE = Not Established

RESPIRATORY PROTECTION: Maintain airborne contaminant concentrations below guidelines listed above, if applicable. Air-purifying respirators with dust/mist/fume filters are recommended if operations may produce mists or sprays from this product.

EYE PROTECTION: Chemical safety goggles. A face shield may also be necessary.

SKIN PROTECTION: Use chemically-resistant gloves (rubber, neoprene or pvc) when handling this product. Wear apron or protective clothing in case of contact.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE and COLOR:	White to off-white tablet	VAPOR PRESSURE, mm Hg @ 20°C :	NA
ODOR:	Slight odor Halogen	VAPOR DENSITY (Air=I):	NA
pH:	3.5 @ 0.15%	SPECIFIC GRAVITY@20°C (water=1):	NA
MELTING/FREEZING POINT:	145-160°C	SOLUBILITY IN WATER:	Slightly
BOILING POINT:	NA	PARTITION COEFFICIENT(n-octanol/wat	er) Not established
FLASHPOINT:	Non-flammable	AUTOIGNITION TEMPERATURE:	NA
EVAPORATION RATE (n-BuAc=1):	NA	DECOMPOSITION TEMPERATURE:	Not established
FLAMMABLE LIMITS (in air by volume, %):	NA	VISCOSITY:	NA
		VOLATILE ORGANIC COMPOUNDS (%)	None

WATER TREATMENT EXPERTISE SINCE 1904

FORMULA 314-T

www.g-c.com

Page 3 of 5

SECTION 10 - STABILITY AND REACTIVITY

REACTIVITY: Not established

STABILITY: Stable under normal temperature condition. Avoid moisture.

HAZARDOUS DECOMPOSITION: Toxic gases/vapors/fumes of: Hydrogen Bromide, Bromine, Hydrogen chloride, chlorine, oxides of carbon,

Nitrogen.

HAZARDOUS POLYMERIZATION: Will not occur.

INCOMPATIBLE MATERIALS: Hydrocarbons, strong acids, strong alkalies, strong oxides, strong reducing agents.

CONDITIONS TO AVOID: Avoid contact with oxidizers or reducing agents. Avoid contact with acids and alkalies. Avoid heat, flames and other sources of ignition. Avoid moisture.

SECTION | | - TOXICOLOGICAL INFORMATION

1-BROMO-3-CHLORO-5.5-DIMETHYL-HYDANTOIN:

Oral: LD50: rats, 578 mg/kg Dermal: LD50: rabbits, 2000mg/kg

Toxicological Information: Ames test negative

Inhalation: May cause irritation to the respiratory system.

Carcinogenicity: None of the components of this product are listed by the NTP, IARC, or regulated by OSHA as carcinogens.

BIOLOGICAL EXPOSURE INDICES: Currently, Biological Exposure Indices (BEIs) have not been determined for the components of this product.

SECTION 12 - ECOLOGICAL INFORMATION

Environmental Fate:

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: Not determined

COD: 1.005 g/g. Material is expected to present a low bioaccumulation potential.

Environmental Toxicity: ECOLOGICAL DATA: Fish: LC50: 96 hr = .87 mg/l

Algae: No Data

Daphnia: LC50: 48 hr = .48 mg/l

Acute Toxicity: LC50: 96hours, 640 mg/l American Oyster.

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL: Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations, those of Canada, Australia, EU Member States and/or Japan, as appropriate. Absorb in vermiculite or dry sand.

SECTION 14 - TRANSPORTATION INFORMATION

DOT

Proper Shipping Name: OXIDIZING SOLID, N.O.S., 5.1, PGII, (I-BROMO-3-CHLORO-5,5-DIMETHYLHYDANTOIN)

Hazard Class: 5.1 UN No.: 1479 Packing Group: II

Transport Description: UN1479, OXIDIZING SOLID, N.O.S., 5.1, PGII, (I-BROMO-3-CHLORO-5,5-DIMETHYLHYDANTOIN)

ERG 140

IMDG/IMO Class: 5.1 Packing Group: II UN No.: 1479

IMO Labeling and Marking: 5.1

Proper Shipping Name: UN1479, OXIDIZING SOLID, N.O.S., 5.1, PGII, (I-BROMO-3-CHLORO-5,5-DIMETHYLHYDANTOIN)

IATA/ICAO Class: 5.1 Packing Group: II UN No.: 1479 IATA/ICAO Labeling: 5.1

Proper Shipping Name: UN1479, OXIDIZING SOLID, N.O.S., 5.1, PGII, (1-BROMO-3-CHLORO-5,5-DIMETHYLHYDANTOIN)

PRODUCT REQUIRES OXIDIZER LABEL

WATER TREATMENT EXPERTISE SINCE 1904

FORMULA 314-T www.g-c.com

Page 4 of 5

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application

SECTION 15 - REGULATORY INFORMATION

United States and International Regulations

United States Regulations: U.S. SARA REPORTING REQUIREMENTS: The components of this product are subject to the reporting as listed below, requirements of Sections 302, 304, and 313 of Title of the Superfund Amendments and Reauthorization Act:

CHEMICAL NAME

I-BROMO-3-CHLORO-5,5-DIMETHYL-

HYDANTOIN

SARA 302 (40CFR 355, APPENDIX A) - NO SARA 304 (40CFR TABLE 302.4) - NO SARA 313 (40CFR 372.65) - NO

U.S. Regulations

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for the components of this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs (4,540 kg) therefore applies, per 40 CFR 370.20.
U.S. CERCLA REPORTABLE QUANTITY (RQ): Not listed

U.S. TSCA INVENTORY STATUS: The components of this product are listed on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS:

SARA TITLE 311/312 HAZARD CATEGORY: ACUTE: YES CHRONIC: NO FIRE: YES REACTIVITY: NO

STATE REGULATIONS

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No component of this product is on the Proposition 65 List.

International Regulations

CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: The components of this product are on the DSL or NDSL Inventories

CANADIAN WHMIS CLASSIFICATION: CLASS D; Div2 Material causing other Toxic effects (Very Toxic)

CLASS E: Corrosive Material

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations.

This material or all of its components are listed on the Canadian Domestic Substances List (DSL).

This material or all of its components are listed (or considered as having been notified) on the European Inventory of Existing Chemical Substances.

Other Inventory Lists:, Korea (TCCL), Australia (AISC), China (Draft), PICCS (Philippines-RA6969), Japan (ENCS METI/MOL).

SECTION 16 - OTHER INFORMATION

Formula 314-T is registered with the NSF to the NSF International Registration Guidelines for Proprietary Substances and Nonfood Compounds for category codes G5, G7, etc.; with NSF Reg. No. 113139.

PREPARED BY: Garratt Callahan

REVISION DATE: March 06, 2012

SUPERCEDES: September 14, 2010

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purpose or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose.

WATER TREATMENT EXPERTISE SINCE 1904 www.g-c.com

FORMULA 314-T

Page 5 of 5

VITA-D-CHLOR TABLETS

VITA-D-CHLOR™ Tablets

Manufactured by: Integra Chemical Co 1216 6th Ave N Kent WA 98032 253,479,7000

SAFETY DATA SHEET

SDS Number: 26645, Revision 002 Revision date: July 7, 2017 Page 1 of 2

24 Hour Emergency Response: CHEMTREC 800-424-9300 (Outside USA: 703-527-3887)

1. IDENTIFICATION

Product name: Vita-D-Chlor™ Tablets

Chemical family: Organic acid

Product number: All Integra Chemical item numbers beginning with V325.50

Recommended use: Dechlorination

Restrictions on use: No information available

2. HAZARDS IDENTIFICATION

OSHA classification: Not a hazardous substance or mixture

Label elements & precautionary statements: Not applicable Hazards not otherwise classified: None identified

3. COMPOSITION/INFORMATION ON INGREDIENTS

None of the components of this product are hazardous materials.

4. FIRST AID PROCEDURES

Skin contact: Wash with soap and water. Seek medical attention if irritation develops. Eye contact: Flush eyes with plenty of water. If irritation persists, seek medical attention.

Inhalation: Remove to fresh air.

Ingestion: Do not induce vomiting. Rinse mouth. If adverse symptoms develop, seek medical attention.

5. FIRE-FIGHTING MEASURES

Extinguishing media: Water spray, carbon dioxide, dry chemical, or foam.

Special equipment/precautions: Use water to cool nearby containers and structures. Wear full protective equipment, including

suitable respiratory protection.

Specific hazards: As with most organic solids, combustion is possible at elevated temperatures.

Hazardous combustion products: Oxides of carbon (CO, CO,)

6. ACCIDENTAL RELEASE MEASURES

Spill procedures: Sweep or scoop into clean, dry disposal container. Wear suitable protective equipment. Flush spill area with water.

7. HANDLING AND STORAGE

Storage and handling: Store in a cool, dry, well-ventilated area away from incompatible materials. Keep containers tightly

closed and protect them from physical damage. Protect from direct light and minimize contact with air. Keep

material dry.

Incompatible materials: Incompatible with strong acids, strong bases, strong oxidizers

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

OSHA & ACGIH exposure limits: None established

Engineering controls: Use adequate general or local exhaust ventilation to keep fume and/or dust levels as low as

possible.

Respiratory protection: None needed unless use generates annoying or irritating dusts, mists or vapors. Use a NIOSH

approved respirator mask if necessary.

Skin & eye protective equipment: Safety glasses.

Facilities storing or utilizing this material should be equipped with an eyewash facility and safety shower. Always handle material in accordance with good chemical handling, industrial hygiene, and safety practices

9. PHYSICAL AND CHEMICAL PROPERTIES

Melting/freezing point:

25/8" tablets Not available Boiling point: Appearance: Flash point: Not available Slight citrus odor Odor: Evaporation rate: Not available Odor threshold: Not available Flammability: Not available pH (1% aqueous solution): 2 to 3

Not available

VITA-D-CHLOR™ Tablets

Manufactured by: Integra Chemical Co 1216 6th Ave N Kent WA 98032 253.479.7000

SAFETY DATA SHEET

SDS Number: 26645, Revision 002 Revision date: July 7, 2017 Page 2 of 2

24 Hour Emergency Response: CHEMTREC 800-424-9300 (Outside USA: 703-527-3887)

9. PHYSICAL AND CHEMICAL PROPERTIES continued

33g/100mL water @25°C Flammable or explosive Upper: Not available Solubility:

Limits (% by volume in air) Lower: Not available Partition coefficient: Not available Not available Not available Vapor pressure: Auto-ignition temperature: Vapor density: Not available Decomposition temperature: Not available Relative density: Not available Viscosity: Not available

10. STABILITY AND REACTIVITY

No information available

Stability Stable

Possibility of hazardous reactions: Hazardous polymerization will not occur

Conditions to avoid: Exposure to light, air, moisture and high temperatures Incompatibles: Incompatible with strong acids, strong bases, strong oxidizers

Oxides of carbon (CO, CO,) Decomposition products:

11. TOXICOLOGICAL INFORMATION

Effects of overexposure:

Inhalation: Inhalation may irritate the nose, throat and upper respiratory tract.

Skin contact: Excessive contact may cause skin irritation.

Eye contact: Contact may cause eye irritation.

Ingestion: Ingestion of small amounts is not likely to produce harmful effects.

Chronic effects: Chronic ingestion of large quantities may cause gastrointestinal effects including nausea, diarrhea, urine

acidification, oxalate and uric crystallization in the bladder and kidneys, decreased reaction times, psychomotor

coordination

Target organs: None identified Additional effects: No information available

Reproductive effects: None identified

No listings by NTP, IARC, or OSHA Carcinogenicity:

Toxicity data: No information available

12. ECOLOGICAL INFORMATION

No information available

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all local, state and federal regulations.

14. TRANSPORTATION INFORMATION

Material is not classified as a dangerous good via either ground or air transportation.

15. REGULATORY INFORMATION

All components are listed in the United States TSCA inventory.

This product is not controlled under WHMIS

16. OTHER INFORMATION

OSHA SDS #: 26645, rev 002; July 7, 2017

The information presented above is offered for informational purposes only. This SDS, and the associated product, is intended for use only by technically qualified persons, and at their own discretion and risk. Since conditions and manner of use are outside the control of Integra Chemical Company, we make no warranties, either expressed or implied, and assume no liability in connection with any use of the information.

Bright Dyes® FLT Yellow/Green Liquid





Safety Data Sheet

Issue Date: 04-Oct-2013 Revision Date: 06-Feb-2017 Version Number: 1.1

1. Identification

Product Identifiers

Product Name: Bright Dyes® FLT Yellow/Green Liquid

Product Number: 106001

Recommended Use & Restrictions on Use

Water tracing & leak detection dye

Manufacturer/Supplier

Kingscote Chemicals, Inc. 3334 South Tech Blvd. Miamisburg, OH 45342

U.S.A.

Emergency Telephone Number

Company Telephone Number: (937) 886-9100

Emergency Telephone (24 hr): INFOTRAC (800) 535-5053 (North America)

+1-352-323-3500 (International)

2. Hazards Identification

Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least

 ${\bf 15\ minutes.\ If\ eye\ irritation\ persists:\ Get\ medical\ advice/attention.}$

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs:

Get medical advice/attention.

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek

medical attention immediately.

Page 1 of 6

Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give

anything by mouth to an unconscious person. Get medical attention if large

quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation.

Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the

system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media

Water spray (fog). Carbon dioxide (CO2). Dry chemical. Regular foam.

Unsuitable Extinguishing Media

Not determined

Specific Hazards Arising from the Chemical

Product is not flammable. Burning/combustion may produce oxides of carbon and nitrogen (NOx).

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or

groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area

with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices.

Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing

should be thoroughly washed before reuse.

Page 2 of 6

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry, and well-

ventilated area. Keep from freezing.

Incompatible Materials Acids.

8. Exposure Controls / Personal Protection

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection Goggles.

Skin & Body Protection Rubber gloves. Suitable protective clothing.

Respiratory Protection No protection is ordinarily required under normal conditions of use.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practices.

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

 Physical State
 Liquid
 Odor
 None apparent

 Appearance
 Yellow/green liquid
 Odor Threshold
 Not determined

 Color
 Yellow/green

Liquid - not applicable

PropertyValuespH>8.0Melting/Freezing Point~32° FBoiling Point/Range~212° FFlash PointNot applicable

Evaporation Rate 1.8

Flammability (solid, gas)

Upper Flammability Limits Not applicable **Lower Flammability Limits** Not applicable **Vapor Pressure** Not applicable Vapor Density 0.6 **Relative Density** Not applicable **Specific Gravity** Not determined Solubility Highly soluble in water **Partition Coefficient** Not determined **Auto-ignition Temperature** Not determined **Decomposition Temperature** Not determined Not determined Viscosity

Page 3 of 6

Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

10. Stability and Reactivity

Reactivity

Not reactive under normal conditions.

Chemical Stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials

Acids. Strong oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation Avoid breathing vapors or mists.

Ingestion Do not ingest.

Skin Contact May cause an allergic skin reaction.

Eye Contact Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure

May cause an allergic skin reaction.

Numerical Measures of Toxicity

Not determined

Symptoms Associated with Exposure

See Section 4 of this SDS for symptoms.

Carcinogenicity

NTP None **IARC** None **OSHA** None

Page 4 of 6



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

12. Ecological Information

Ecotoxicity

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Not available

Persistence/Degradability

Not determined

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. Disposal Considerations

Waste Disposal Methods

Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

Note

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

OMDG Not regulated

15: Regulatory Information

International Inventories

TASCA This product is not subject to TSCA 12(b) reporting requirements.

U.S. Federal Regulations

CERCLA This material, as supplied, does not contain any substances regulated as

hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Page 5 of 6



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization

Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of

Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants

pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable

state right-to-know regulations.

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<u>HM</u>	<u>IS</u> Health Hazards 1	Flammability O	Instability O	Special Hazards Not determined
NFF	<u>A</u> Health Hazards 1	Flammability O	Physical Hazards	Personal Protection B
	Issue Date	04-Oct-2013		
	Revision Date	06-Feb-2017		
	Revision Note	Content Review		

<u>Disclaimer</u>

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Page 6 of 6

Bright Dyes® FLT Yellow/Green Tablet





Safety Data Sheet

Issue Date: 09-Nov-2013 Revision Date: 06-Feb-2017 Version Number: 2.1

1. Identification

Product Identifiers

Product Name: Bright Dyes® FLT Yellow/Green Tablet

Product Number: 101101

Recommended Use & Restrictions on Use

Water tracing & leak detection dye

Manufacturer/Supplier

Kingscote Chemicals, Inc. 3334 South Tech Blvd. Miamisburg, OH 45342 U.S.A.

Emergency Telephone Number

Company Telephone Number: (937) 886-9100

Emergency Telephone (24 hr): INFOTRAC (800) 535-5053 (North America)

+1-352-323-3500 (International)

2. Hazards Identification

Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least

15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs:

Get medical advice/attention.

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek

medical attention immediately.

Page 1 of 6

Bright Dyes® FLT Yellow/Green Tablet

Revision Date: 06-Feb-2017

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give

anything by mouth to an unconscious person. Get medical attention if large

quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation.

Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the

system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media

Water spray (fog). Carbon dioxide (CO2). Dry chemical.

Unsuitable Extinguishing Media

Not determined

Specific Hazards Arising from the Chemical

Remote possibility of dust explosion. Burning may produce oxides of carbon and nitrogen (NOx).

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or

groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area

with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices.

Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing

should not be allowed out of the workplace.

Page 2 of 6



Bright Dyes® FLT Yellow/Green Tablet Revision Date: 06-Feb-2017

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry, and well-

ventilated area. Store away from heat, sparks, open flame or any other

ignition source.

Incompatible Materials Bromine trifluoride. Lithium. Strong acids, bases, and oxidizing agents.

8. Exposure Controls / Personal Protection

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection Avoid contact with eyes.

Skin & Body Protection Rubber gloves. Suitable protective clothing.

 $\textbf{Respiratory Protection} \qquad \text{Use NIOSH-approved dust mask if dusty conditions exist.}$

Hygiene Measures Handle in accordance with good industrial hygiene and safety practices.

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

Physical StateSolidOdorNone apparentAppearanceOrange tabletOdor ThresholdNot determined

Color Orange

Property Values рΗ Not applicable Melting/Freezing Point Not applicable **Boiling Point/Range** Not applicable Flash Point Not applicable Not applicable **Evaporation Rate** Flammability (solid, gas) Not flammable **Upper Flammability Limits** Not applicable **Lower Flammability Limits** Not applicable **Vapor Pressure** Not applicable Vapor Density Not applicable **Relative Density** Not applicable **Specific Gravity** Not applicable

Solubility Highly soluble in water with small amounts of insoluble residue

Partition Coefficient
Auto-ignition Temperature
Decomposition Temperature
Viscosity

Not determined
Not determined
Not determined

Page **3** of **6**

Bright Dyes® FLT Yellow/Green Tablet

Revision Date: 06-Feb-2017

10. Stability and Reactivity

Reactivity

Not reactive under normal conditions.

Chemical Stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials

Bromine trifluoride. Lithium. Strong acids, bases, and oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation Avoid inhalation of dust.

Ingestion Do not ingest.

Skin Contact May cause an allergic skin reaction.

Eye Contact Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure

May cause an allergic skin reaction.

Numerical Measures of Toxicity

Not determined

Symptoms Associated with Exposure

See Section 4 of this SDS for symptoms.

Carcinogenicity

NTP None

IARC None

OSHA None

Page 4 of 6



Bright Dyes® FLT Yellow/Green Tablet

Revision Date: 06-Feb-2017

12. Ecological Information

Ecotoxicity

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Not available

Persistence/Degradability

This product is biodegradable.

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. Disposal Considerations

Waste Disposal Methods

Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

<u>Note</u>

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

OMDG Not regulated

15: Regulatory Information

International Inventories

Not determined

U.S. Federal Regulations

CERCLA This material, as supplied, does not contain any substances regulated as

hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Page 5 of 6



Bright Dyes® FLT Yellow/Green Tablet

Revision Date: 06-Feb-2017

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization

Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of

Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants

pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable

state right-to-know regulations.

16: Other Information

HMIS Health Hazards 1	Flammability 0	Instability O	Special Hazards Not determined
<u>NFPA</u> Health Hazards 1	Flammability 0	Physical Hazards O	Personal Protection B
Issue Date	09-Nov-2013		
Revision Date	06-Feb-2017		
Revision Note	Content Review		

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End of Safety Data Sheet

Page 6 of 6



Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application Outfall 05A055 Fact Sheet

Weapons Facility Operations
High Explosive Wastewater Treatment Facility (HEWTF)





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Table of Contents

1.0	OUTFALL LOCATION [Section I]	5
2.0	FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]	5
2.1	Process Schematic and Water Balance [II.A]	5
2.2	Water Treatment Processes [II.B]	5
2.3	Discharge Rate and Frequency [II.C]	6
3.0	PRODUCTION [Section III]	6
4.0	IMPROVEMENTS [Section IV]	6
5.0	INTAKE AND EFFLUENT CHARACTERISTICS [Section V]	6
5.1	Analytical Data [V.A, B, and C]	6
5.2	Potential Pollutants [V.D]	7
6.0	POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]	7
7.0	BIOLOGICAL TOXICITY TESTING DATA [Section VII]	7
8.0	CONTRACT ANALYSIS INFORMATION [Section VIII]	7
ATTAC	CHMENT A: Location Map for Outfall 05A055	A-1
ATTAC	CHMENT B: Process Schematic and Water Balance	B-1
ATTAC	CHMENT C: Photographs	C-1
ATTAC	CHMENT D: Safety Data Sheets	E-1

List of Tables

- 1 Sources for Discharges to Outfall 05A055
- Wastewater Treatment Codes Assigned to Outfall 05A055
- 3 List of Treatment Chemicals used in the Operations that Contribute to Outfall 05A055
- 4 Flow Rates and Frequencies for Discharges to Outfall 05A055
- 5 Potential Pollutants by Source for Outfall 05A055
- 6 List of Independent Laboratories Used for NPDES Water Analysis



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INDUSTRIAL AND SANITARY OUTFALLS 2019 NPDES PERMIT RE-APPLICATION OUTFALL O5A055 FACT SHEET

1.0 OUTFALL LOCATION [Section I]

Outfall ID No.:	05A055	Outfall Location:	Technical Area 16
Category:	05A, High Explosives	Originating Structure	TA-16-1508
	Wastewater Discharge	for the Discharge:	
Flow Type:	Intermittent	Receiving Stream:	Ephemeral Tributary to Canon de Valle
			in Water Quality Segment 20.6.4.128
			NMAC
Longitude:	106° 19' 52" W	Latitude:	30° 50' 49" N

2.0 FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]

Outfall 05A055 is located at TA-16 and discharges to an ephemeral tributary of Canon De Valle in Water Quality Segment 20.6.4.128 NMAC. The outfall discharges treated wastewater that originates at TA-16-1508 at the High Explosives Wastewater Treatment Facility (HEWTF). Attachment A provides a location map. Table 1 identifies the discharge source, the source location, and source composition.

			Та	ble 1	
			Sources for Dischar	ges to Outfall 05A055	
TA	Building	Туре	Transportation Mode (Piping, Truck etc.)	Discharge Source	Source Composition
16	1508	Process ^a	Truck	High Explosives Wastewater Treatment Facility (HEWTF)	Treated HEWTF Effluent

a. Some storm water as precipitation enters the tanks through the sand filters.

2.1 Process Schematic and Water Balance [II.A]

A process schematic line drawing that shows the route taken by water from intake to the discharge at Outfall 05A055 is provided in Attachment B. This drawing includes all operations that contribute treated process water and storm water to the discharge at the outfall. A water balance is also provided on the process schematic with average flows for the cooling tower intakes and blowdown. The water balance was estimated using influent data and the HEWTF treatment equipment capabilities.

2.2 Water Treatment Processes [II.B]

The HEWTF receives and treats high explosives (HE) contaminated process and/or storm water from various sumps, tanks, and facilities at TA-9 and TA-16. Table 2 identifies the wastewater treatment codes associated with the HEWTF. All water that is received at the HEWTF must comply with the Waste Acceptance Criteria, must have a completed and approved Waste Stream Profile Form, and is tracked in a water treatment logbook.

	Wastewater T	Table 2 reatment Codes Assigned to Outfall 05A055
Treatment Code	Description	Justification
1V	Slow Sand Filtration	Sand filters remove particulates of high explosive (HE) prior to treatment.
2A	Carbon Adsorption	Carbon adsorption to remove HE.
2J	Ion Exchange	Ion Exchange to remove anions and cations.
1F	Evaporation	Effluent is evaporated.

The HE contaminated wastewater and storm water is collected by pumper truck and discharged to one of two sand filters where it is filtered to remove solids. The filtered water from the sand filters is collected in a belowground storage tank and then pumped through cartridge filters to an equalization tank at the HEWTF. The wastewater from the equalization tank is circulated through Granular Activated Carbon (GAC) and/or Ion Exchange (IX) to remove residual HE, barium, perchlorate,

and other contaminants. The treatment process is designed to circulate the wastewater through the process multiple times prior to storage in the post treatment tanks and discharge to either electric evaporators or to Outfall 05A055. The HEWTF operations may include bypass of either the GAC tanks and/or IX columns when discharging to the electric evaporator(s). Attachment C provides photographs of the outfall location and treatment equipment.

The water treatment processes identified in Table 2 utilize chemicals to remove contaminates. Table 3 provides a list of the chemicals used at the HEWTF.

List	of Treatment Chemicals used in	Table 3 the Operations that Cont	ribute to Outfall 05A055	
Source	Chemical Name	Reason for Use	Toxic Pollutant and/or Ha	
High Explosives Wastewater	Granular Activated Carbon (GAC)	GAC used to remove residual HE	NA	NA
Treatment Facility	CG10-BL Ion Exchange	Ion Exchange Resin for	Polystyrene sulfonate	2C-3,
(HEWTF)	Resin	Barium Removal	(styrene)	2C-4
	SIR-110-HP Ion Exchange	Ion Exchange Resin for	Tributylamine (styrene &	2C-3,
	Resin	Perchlorate Removal	divinylbenzene)	2C-4

2.3 Discharge Rate and Frequency [II.C]

The discharge rates and frequencies for Outfall 05A055 are provided in Table 4.

Table 4 Flow Rates and Frequencies for Discharges to Outfall 05A055							
	Frequency			Flow Rates and Volumes			
Source ^{a, b}	Days/Week	Months	Average (MGD)	Maximum (MGD)	Average Volume (GPD)	Maximum Volume (GPD)	Duration (days)
High Explosives Wastewater Treatment Facility (HEWTF)	0.1	0.1	0.0003	0.0021	270	2,120	4

a. Estimated based upon the influent receipt logbooks and the capacity of the post treatment tanks.

GPD = gallons per day, MGD = million gallons per day

3.0 PRODUCTION [Section III]

Section III is not applicable to Outfall 05A055.

4.0 IMPROVEMENTS [Section IV]

Section IV is not applicable to Outfall 05A055.

5.0 INTAKE AND EFFLUENT CHARACTERISTICS [Section V]

5.1 Analytical Data [V.A, B, and C]

The analytical results provided for the Outfall 05A055 Permit Reapplication on the Form 2C were provided from the following sources:

- Operational samples collected on September 26, 2018 and January 24, 2019 that were shipped to an independent laboratory for analysis.
- Field samples collected and analyzed on September 26, 2018 for temperature, residual chlorine, and pH.
- Field samples collected and analyzed on January 24, 2018 for sulfite.
- Hardness = 2.9 mg/L (CaCO₃)

b. The HEWTF is a batch treatment facility.

A discharge monitoring report summary is not provided for Outfall 05A055 because the effluent from the HEWTF was not discharge to Canon de Valle between October 2014 and September 2018. Effluent from the HEWTF was routed to the electric evaporator(s).

5.2 Potential Pollutants [V.D]

The treatment chemicals associated with the HEWTF and the composition of the influent it receives for treatment constitute the pollutant load of the discharge to Outfall 05A055. Table 5 identifies the Table 2C-3 and 2C-4 pollutants by discharge source. It also identifies those pollutants (if any) that were detected in the analytical results from the samples collected for the 2019 Permit Renewal Application.

Pot	ential Pollutants b	Гable 5 y Source for	Outfall 05A055
Source	POTENTIAL Toxic Pollutant and/or Hazardous Substances Table 2C-3 or 2C-4		Analytical Data Results from Operational Samples Collected for Outfall 05A055
High Explosives Wastewater Treatment Facility (HEWTF)	styrene	2C-3, 2C-4	Not analyzed. ^b
High Explosives Wastewater	acetone ^a	2C-4	Not analyzed. ^b
Treatment Facility (HEWTF)	ammonia	2C-4	2.27 mg/L
Chemicals identified on influent Waste Stream Profile	benzoic acid	2C-4	pH = 6.5 – 8.7 S.U.
forms.	chloroform	2C-4	Not detected.
	dinitrotoluene	2C-3	Not detected.
	sodium	2C-4	1040 mg/L
	toluene ^a	2C-4	Not detected.
	uranium	2C-3	Not analyzed. b

- a. Results are from operational samples collected from the post treatment tanks. These samples are representative of the effluent after final treatment and the potential discharge to Outfall 05A055.
- b. The potential pollutant was determined to not be associated with a "Listed" Resource Conservation and Recovery Act (RCRA) hazardous waste at the point of generation. This waste determination was documented with the associated waste stream profile form and in the waste characterization and tracking system database.
- c. The potential pollutant was not analyzed because it is not specifically called out on the Form 2C.

The safety data sheets associated with the chemicals used to treat water at the HEWTF are provided in Attachment D.

6.0 POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]

Section VI is not applicable to Outfall 05A055.

7.0 BIOLOGICAL TOXICITY TESTING DATA [Section VII]

Section VII is not applicable to Outfall 05A055.

8.0 CONTRACT ANALYSIS INFORMATION [Section VIII]

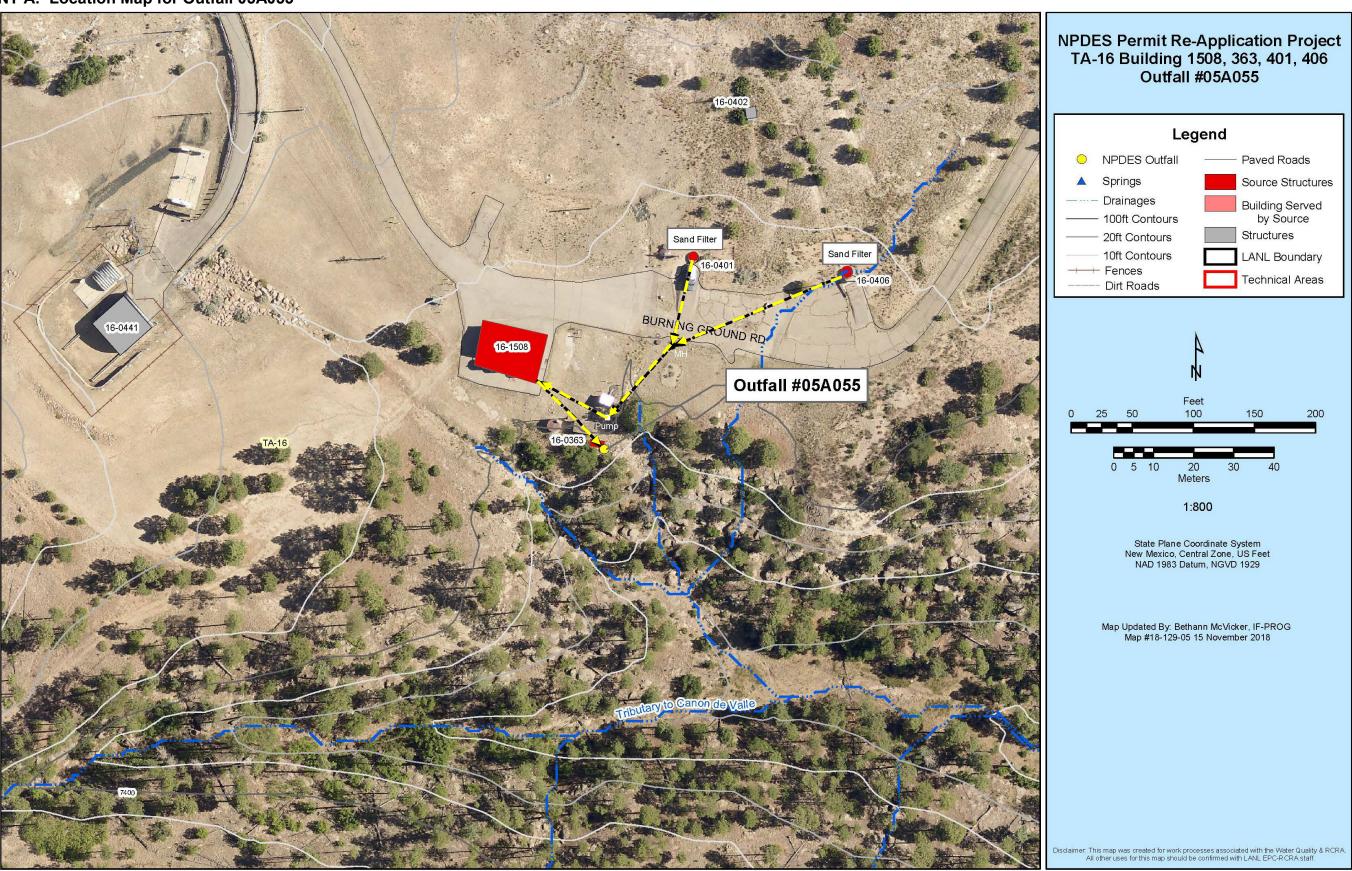
Operational Samples from the HEWTF for the Form 2C constituents required by the permit application forms were collected on September 26, 2018 and January 24, 2019. These samples were submitted to independent laboratories as summarized in Table 6.

EPA ID No. NM0890010515

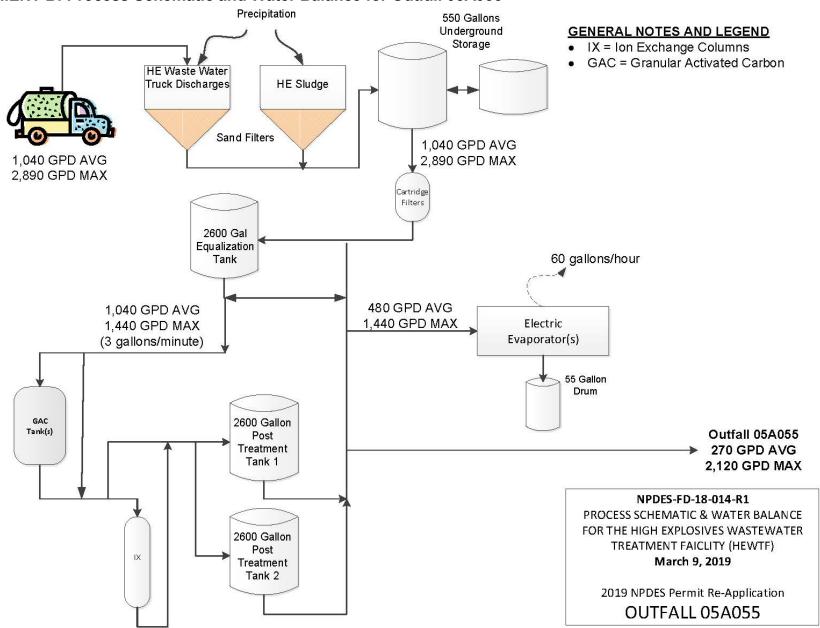
List	Table of Independent Laboratories U	6 sed for NPDES Water Analysis
Laboratory Name	Address and Contact Info	Analytes
GEL Laboratories LLC	2040 Savage Road Charleston SC 29407	Biological Oxygen Demand, General Chemistry Pesticides, Polychlorinated Biphenyls, Radiochemistry,
	(843) 556-8171	Semi-volatile Organic Compounds, Total Metals, Total Suspended Solids, Volatile Organic Compounds
New Mexico Water	401 North Coronado Ave	E.coli
Testing Laboratory, Inc.	Espanola, NM 87532	
	(505) 929-4545	
Cape Fear Analytical LLC	3306 Kitty Hawk Road Suite 120 Wilmington, NC 28405 (910) 795-0421	TCDD (Dioxin)



ATTACHMENT A: Location Map for Outfall 05A055



ATTACHMENT B: Process Schematic and Water Balance for Outfall 05A055





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ATTACHMENT C: Photographs

NPDES-05A055-18-001	Outfall 05A055 - Location
NPDES-05A055-18-002	Outfall 05A055 - Receiving Stream Ephemeral Tributary to Canyon de Valle, Water Quality Segment Number 20.6.4.128 NMAC
NPDES-05A055-18-003	Outfall 05A055 - Condition at Hose Connection for Discharge to the Outfall
NPDES-05A055-18-004	High Explosives Wastewater Treatment Facility (HEWTF)
NPDES-05A055-18-005	HEWTF – Sand Filters and Tanker Truck
NPDES-05A055-18-006	HEWTF – Sand Filter
NPDES-05A055-18-007	HEWTF – Underground Storage Tanks
NPDES-05A055-18-008	HEWTF - Cartridge Filters
NPDES-05A055-18-009	HEWTF - Equalization Tank
NPDES-05A055-18-010	HEWTF - Granulated Activated Carbon Tanks
NPDES-05A055-18-011	HEWTF - Ion Exchange Tanks
NPDES-05A055-18-012	HEWTF - Post Treatment Tanks
NPDES-05A055-18-013	HEWTF - Evaporator



Photograph - NPDES-05A055-18-001 Outfall 05A055 - Location

LA-UR-19-22215 **Attachment C** C-1 of 8





Photograph - NPDES-05A055-18-002 Outfall 05A055 - Receiving Stream Ephemeral Tributary to Canyon de Valle, Water Quality Segment Number 20.6.4.128 NMAC



Photograph - NPDES-05A055-18-003 Outfall 05A055 - Condition at Hose Connection for Discharge to the Outfall

LA-UR-19-22215 **Attachment C** C-2 of 8





Photograph - NPDES-05A055-18-004 **High Explosives Wastewater Treatment Facility (HEWTF)**



Photograph - NPDES-05A055-18-005 **HEWTF – Sand Filters and Tanker Truck**

LA-UR-19-22215 Attachment C C-3 of 8





Photograph - NPDES-05A055-18-006 **HEWTF - Sand Filter**



Photograph - NPDES-05A055-18-007 **HEWTF - Underground Stroage Tanks**

LA-UR-19-22215 **Attachment C** C-4 of 8



Photograph - NPDES-05A055-18-008 **HEWTF - Cartridge Filters**



Photograph - NPDES-05A055-18-009 **HEWTF - Equalization Tank**





Photograph - NPDES-05A055-18-010 **HEWTF - Activated Carbon Filter Tanks**



Photograph - NPDES-05A055-18-011 **HEWTF - Ion Exchange Tanks**

LA-UR-19-22215 Attachment C C-6 of 8





Photograph - NPDES-05A055-18-012 **HEWTF - Post Treatment Tanks**



Photograph - NPDES-05A055-18-013 **HEWTF** - Evaporator

LA-UR-19-22215 Attachment C C-7 of 8



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ATTACHMENT D: Safety Data Sheets

LIST OF SAFETY DATA SHEETS
Granular Activated Carbon (GAC)
CG10-BL Ion Exchange Resin
SIR-110-HP Ion Exchange Resin

LA-UR-19-22215 **Attachment D** D-1 of 26



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GRANULAR ACTIVATED CARBON





Safety Data Sheet

SECTION I Identity

PRODUCT IDENTIFICATION: Activated Carbon, GAC, R, VCC, VCCAW, VCO, VCOAW, VP, PAC

PRODUCT USE: Use in accordance with manufacturer recommendations

MANUFACTURER:

BakerCorp 3020 Old Ranch Parkway

Suite 220

Seal Beach, CA 90740

TELEPHONE: (562) 430-6262 EMERGENCIES: (562) 430-6262

Date Prepared: 7/15/2015

SECTION II Hazard(s) Identification

Hazard Classification: GHS-US

Eye Irritation 2B H320 Respiratory Irritation 3 H335

Signal Word: Irritant

Hazard Statement: Contact may cause eye irritation: Dust may cause respiratory irritation.

Hazard Pictogram:



Precautionary statements:

P261	Avoid Breathing: dust/fume/gas/mist/vapor/spray.
P264	Wash thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protections/face protection
P304/P340	If inhaled/Remove to fresh air
P305/P351/P338	If in eyes/rinse cautiously with water/remove contact lenses if easy/continue rinsing
P337/P313	If eye irritation persist: get medical attention
P403/P233	Store in well ventilated place. Keep container tightly closed
P405	Store locked up
P501	Dispose container to appropriate receptacle





Other Hazards: No additional information

Acute Toxicity: No data available

SECTION III	Composition/Information on Ingredients

Chemical Name CAS# % **Impurities** Carbon 100 7440-44-0 None

SECTION IV	First-Aid Measures	
------------	--------------------	--

First Aid Route(s) of Exposure **Symptoms** Inhalation Remove to fresh air. Seek medical attention if Dust may cause mild respiratory irritation irritation persists Skin Dust may cause mild Wash with soap & water, seek medical attention if irritation/reddening irritation persists. Flush with lukewarm water for at least 15 minutes. If Eye Dust may cause eye irritation and redness. irritation persists seek medical attention. Ingestion May cause digestive track Drink plenty of water and seek medical attention. irritation.

SECTION V Fire Fighting Measures

Flood with plenty of water, use media suitable for surrounding the fire. Suitable Extinguishing Media:

Unsuitable Media: None known.

Contact with strong oxidizers may cause rapid combustion. Unusual fire & explosion hazards:

Special Firefighting procedures: Exercise caution when responding to any chemical fire. Firefighters

should wear full protective gear.

SECTION VI Accidental Release Measures

Personal Precautions: Wear protective equipment, keep unnecessary personnel away.

General precautions: Avoid contact with skin and eyes.

Environmental Precautions:

Containment & Clean Up: Sweep up and discard in protected refuse container.

Other Information: Not applicable

SECTION VII Handling and Storage

Safe Handling: Avoid prolonged contact with eyes and skin. Use in well ventilated

areas





Safe Storage:

Store in a cool, dry and well ventilated area. Protect containers from physical damage. Keep away from oxidizers, heat and flame.

SECTION VIII	Exposure Controls/Personal Protection	

Component	OSHA PEL	ACGIH-TLV	Other Limits
Activated Carbon	Not Available	Not Available	

Engineering Guidelines	Local exhaust and general ventilation to meet exposure standards. Wet activated carbon depletes oxygen from the air creating a severe hazard to workers in enclosed or confined spaces. Sampling and work procedures for low oxygen levels should be taken whenever workers entering carbon vessels, enclosed or confined spaces. If risk of overexposure exists, wear and approved respirator.
Personal Protective Equipment	Use NIOSH approved respirator if dust generated exceeds exposure limits. Gloves, safety glasses, work clothes as determined appropriate
General Hygiene	Keep away from food and beverages, remove contaminated clothing: wash hands before eating.

SECTION IX Physical & Chemical Properties

Physical State	Solid	Boiling point	NA
Appearance	Granular/powder	Flash Point	NA
Color	Black	Evaporation Rate	NA
Odor	None	Flammability (solid/gas) C	No Data Available
Odor Threshold	None	UEL	NA
Vapor Pressure	0	LEL	NA
pН	NA	Vapor Density	Solid
Relative Density	28 – 33 lbs/cubic ft	Partition Coefficient:	NA
Melting Point	NA	Auto ignition Temperature	No data available
Freezing Point	NA	Decomposition Temperature	NA
Solubility	None	Viscosity	NA

SECTION X	Stability & Reactivity	

Incompatibility: Strong oxidizers such as ozone or liquid oxygen, and chlorine

Chemical Stability: Stable Conditions to Avoid:

Materials to Avoid: Strong oxidizers such as ozone or liquid oxygen, and chlorine Hazardous Decomposition Products: Carbon Monoxide and carbon dioxide may be generated during

combustion.





SECTION XI	Toxicological Information	
Acute Effects	1	

Acute Effects	
Oral LD50	Not Determined
Dermal LD 50	Not Determined
Inhalation	See Section IV
Ingestion	See Section IV
Eye Irritation	See Section IV
Skin Irritation	See Section IV
Sensitization	Not Determined
Signs and Symptoms of Exposure	Irritation and redness of eyes and skin. Dust may cause respiratory irritation

Chronic Effects:		
Carcinogenicity	Not Determined	
Mutagenicity	Not Determined	
Reproduction Effects	Not Determined	
Developmental Factors	Not Determined	

SECTION XII	Ecological Information	
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Ecotoxicity	Not Determined
Persistence/Degradability	Not Determined
Bioaccumulation Potential	Not Determined
Mobility in Soil	Not Determined
Other Adverse Effects	Not Determined

SECTION XIII	Disposal Concerns	
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Vacuum or shovel material in a closed container. Dispose of in accordance with all applicable local, state and federal and international regulations.





SECTION XIV Transport Information

UN Number: Not applicable UN Name: Not applicable

Ship in accordance with

DOT/ADR/RID/ADNR/IMDP/ICAO/IATA

SECTION XV	Regulatory Information	
SARA Title III 302	Product not listed	
SARA Title III 313	Product not listed	
TSCA	Product is listed	
Canadian – WHMIS	Product is listed	
DSL#	Product is Listed	
SECTION XVI	Other Information	

The information and recommendations listed are believed to be true and accurate to the best of our knowledge as of the prepared date below. BakerCorp makes no warranty with respect to same and disclaims all liability for reliance therein.

Date Prepared: May 25, 2015



ION EXCHANGE RESIN





Safety Data Sheet

Product Names: CGS, CGS-BL, CG8, CG8-BL, CG8-C, CG8-F, CG8-UPS, CG8-HP, CG8-NS, CG10, CG10-BL, CG10-UPS, CG10-HP, SACMP, SACMP-UPS

> (Cation Exchange Resin in the Sodium Form) Effective date February 23, 2018

Secti				

1a Product Names ResinTech CGS, CGS-BL, CG8, CG8-BL, CG8-C,

> CG8-F, CG8-UPS, CG8-HP, CG8-NS, CG10, CG10-BL, CG10-UPS, CG10-HP, SACMP,

SACMP-UPS

1b Common Name Cation exchange resin in the sodium form.

1c Intended use All general purpose cation exchange for general

use including water softening and demineralization.

ResinTech, Inc. 1d Manufacturer

160 Cooper Road, Address

West Berlin, NJ 08091 USA

Phone 856-768-9600

Email ixresin@resintech.com

Section 2: Hazard Identification

2a OSHA Hazard classification Not hazardous or dangerous

Product Hazard Rating	Scale
Health = 0	0 = Negligible
Fire = 1	1 = Slight
Reactivity = 0	2 = Moderate
Special - N/A	3 = High
	4 = Extreme

Amber, tan or black colored solid beads with little 2b Product description

or no odor.

Safety glasses and gloves recommended. 2c Precautions for use

Slipping hazard if spilled.

2c Potential health effects Will cause eye irritation.

Ingestion is not likely to pose a health risk.

2d Environmental effects Little or none.

LA-UR-19-22215 Attachment D

Section 2A: Hazard classification UN OSHA globally harmonized system



Warning (contains ion exchange resin)

H320: Causes eye irritation (Category 2B)

Precautionary Statements

P264: Wash hands thoroughly after handling.

P280: Wear protective gloves/protective clothing/eye protection/face protection

P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact

lenses if present and easy to do - continue rinsing.

P333+313: If skin irritation or a rash occurs: Get medical advice/attention.

P337+313: If eye irritation persists get medical advice/attention.

P403+233: Store in a well-ventilated place. Keep container tightly closed.

P411: Store at temperatures not exceeding 50 °C/ 122 °F.

Please refer to the safety data sheet for additional information regarding this product

ResinTech, Inc. 160 Cooper Road West Berlin, NJ 08091-9234 856 768-9600 Ixresin@resintech.com



Section 4: First Aid Measures

Section 3: Composition/ Information on Ingredients			
За	Chemical name	Polystyrene sulfonate in the sodium form	
3b	Ingredients Polystyrene sulfonate in the sodium form	CAS# 69011-22-9 (40 - 60%)	
	Water	CAS# 7732-18-5 (40 – 60%)	

4a	Inhalation	No adverse effects expected- normal use of product does not produce odors or vapors.
4b	Skin	Wash with soap and water- seek medical attention if a rash develops.
4c	Eye contact	Wash immediately with water-seek attention if discomfort continues.
4d	Ingestion	No adverse effects expected for small amounts, larger amounts can cause stomach irritation. Seek medical attention if discomfort occurs.
Sec	tion 5: Fire Fighting Measures	
5a	Flammability	NFPA Fire rating = 1
5b	Extinguishing media	Water, CO2, foam, dry powder
5c	Fire fighting Procedures	Follow general fire fighting procedures indicated in the work place.
5d	Protective Equipment	MSHA/NIOSH approved self-contained breathing gear, full protective clothing.
5e	Combustion Products	Carbon oxides and other toxic gasses and vapors.
5f	Unusual Hazards	Product is not combustible until moisture is removed. Resin begins to burn at approximately 230° C. Auto ignition can occur above 500° C.



Sec	Section 6: Accidental Release Measures				
6a	Personal Precautions	Keep people away, spilled resin can be a slipping hazard, wear gloves and safety glasses to minimize skin or eye contact.			
6b	Incompatible Chemicals	Strong oxidants can create risk of combustion products similar to burning.			
6c	Environmental Precautions	Keep out of public sewers and waterways.			
6d	Containment Materials	Use plastic, paper, or metal containers.			
6e	Methods of Clean-up	Sweep up material and transfer to containers.			
Sec	Section 7: Handling and Storage				
7a	Handling	Avoid prolonged skin contact. Avoid contact with salts or with salty water to prevent premature exhaustion of the resin. Keep resin moist and avoid allowing resin to completely dry.			
7b	Storage	Store in a cool dry place (0° to 45° C) in the original shipping container. This product is thermally sensitive and will have reduced shelf life if subjected to extended periods of time at temperatures exceeding 50° C. Although freezing does not usually damage ion exchange resins, avoid repeated freeze thaw cycles.			

Section 8:	Exposure	Controls/F	Personal	Protection
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8a OSHA exposure limits None noted.

8b Engineering Controls Provide adequate ventilation.

8c Personal Protection Measures

Eye Protection Safety glasses or goggles.
Respiratory Protection Not required for normal use.

Protective Gloves Recommended for extended contact.



Section 9: Physical and Chemical Properties

Appearance Amber, tan, or black beads.
Flammability or explosive limits Flammable above 500° C

Odor None
Physical State Solid

Vapor pressure Not available
Odor threshold Not available
Vapor density Not available

pH Near neutral (6 to 8 typical)
Relative density Approx 800 grams/Liter

Melting point/freezing point Does not melt, freezes at approx. 0 C Solubility Insoluble in water and most solvents

Boiling point Does not boil
Flash point Approx 500° C

Evaporation rate Does not evaporate

Partition Coefficient (n-octonol/water)

Auto-ignition temperature

Decomposition temperature

Viscosity

Not applicable

Approx 500° C

Above 230° C

Not applicable

Section 10: Stability and Reactivity

10a Stability Stable under normal conditions.

10b Conditions to Avoid Heat, exposure to strong oxidants.

10c Hazardous by-products Organic sulfonates, charred polystyrene, aromatic

acids and hydrocarbons, organic amines, nitrogen oxides, carbon oxides, chlorinated hydrocarbons.

10d Incompatible materials Strong oxidizing agents (such as HNO₃)

10e Hazardous Polymerization Does not occur



Section 11: Toxicological Information

11a Likely Routes of Exposure Oral, skin or eye contact.

11b Effects of exposure

Delayed None known.
Immediate (acute) None known.
Chronic None known.

11c Toxicity Measures

Skin Adsorption Unlikely.

Ingestion Oral toxicity believed to be low but no LD50 has

been established.

Inhalation Unknown, vapors are very unlikely due to physical

properties (insoluble solid).

11d Toxicity Symptoms

Skin Adsorption Mild rash.

Ingestion Indigestion or general malaise.

Inhalation Unknown.

11e Carcinogenicity None known

Section 12: Ecological information

12a Eco toxicity Not harmful to plant or animal life.

12b Mobility Insoluble.

12c Biodegradability Not biodegradable.

12d Bioaccumulation Insignificant.

12e Other adverse effects Not Harmful to the environment.



Section 13: Disposal Considerations				
13a General considerations	Material is non-hazardous.			
13b Disposal Containers	Most plastic and paper containers are suitable.			
13c Disposal methods	No specific method necessary			
13d Sewage Disposal	Not recommended			
13e Precautions for incineration	May release toxic vapors when burned			
13f Precautions for landfills	Resins used to remove hazardous materials may then become hazardous mixtures.			
Section 14: Transportation Information				
14a Transportation Class	Not classified as a dangerous good for transport by land, sea, or air.			
14b TDG	Not regulated.			
14c IATA	Not regulated.			
14d DOT (49 CFR 172.101)	Not Regulated.			
Section 15: Regulatory Information				
15a CERCLA	Not regulated			
15b SARA Title III	Not regulated			
15c Clean Air act	Not regulated			
15d Clean Water Act	Not regulated			
15e TSCA	Not regulated			
15f Canadian Regulations WHMIS TDG	Not a controlled product Not regulated			
15g Mexican Regulations	Not Dangerous			



Section 16: Other Information

The information provided in this safety data sheet is presented in good faith and believed to be accurate as of the effective data shown above. However, no warranty or guarantee of accuracy, express or implied is given. Regulatory requirements are subject to change and may differ from one location to another. It is the buyer's responsibility to ensure that their activities comply with federal, state, and local laws.

16a Date of Revision 31 March 2015



ION EXCHANGE RESIN





Safety Data Sheet

Product Name: SIR-110-HP

(Perchlorate selective Strong Base Anion Exchange Resin Chloride Form) Effective date February 23, 2018

Section 1: Identification

Product Name ResinTech SIR-110-HP 1a

1b Common Name Perchlorate and nitrate Selective strong base anion

resin in the chloride form.

1c Intended use Removal of perchlorate, iodide, and from water.

1d Manufacturer ResinTech, Inc.

160 Cooper Road, Address

West Berlin, NJ 08091 USA

Phone 856-768-9600

Email ixresin@resintech.com

Section 2: Hazard Identification

OSHA Hazard classification Not hazardous or dangerous

Product Hazard Rating	Scale
Health = 0	0 = Negligible
Fire = 1	1 = Slight
Reactivity = 0	2 = Moderate
Special - N/A	3 = High
	4 = Extreme

Light cream to light yellow colored solid beads Product description 2b

with little or no odor.

2c Precautions for use Safety glasses and gloves recommended.

Slipping hazard if spilled.

Potential health effects Will cause eye irritation.

May casue mild skin irritation.

Ingestion is not likely to pose a health risk.

2d Environmental effects Little or none.

LA-UR-19-22215 **Attachment D**

Section 2A: Hazard classification UN OSHA globally harmonized system



Warning (contains ion exchange resin)

H320: Causes eye irritation (Category 2B)

Precautionary Statements

P264: Wash hands thoroughly after handling.

P280: Wear protective gloves/protective clothing/eye protection/face protection

P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact

lenses if present and easy to do - continue rinsing.

P333+313: If skin irritation or a rash occurs: Get medical advice/attention.

P337+313: If eye irritation persists get medical advice/attention.

P403+233: Store in a well-ventilated place. Keep container tightly closed.

P411: Store at temperatures not exceeding 50 °C/ 122 °F.

Please refer to the safety data sheet for additional information regarding this product

ResinTech, Inc. 160 Cooper Road West Berlin, NJ 08091-9234 856 768-9600 Ixresin@resintech.com



Section 4: First Aid Measures

Sec	Section 3: Composition/ Information on Ingredients				
3a	Chemical name	Tributylamine functionalized chloromethylated copolymer of polystyrene in the chloride form.			
3b	Ingredients Tributylamine functionalized chloromethlyated copolymer of styrene and divinylbenzene in the chloride form	CAS# 116565-72-1 (55 - 70%)			
	Water	CAS# 7732-18-5 (30 – 45%)			

4a	Inhalation	No adverse effects expected- normal use of product does not produce odors or vapors.		
4b	Skin	Wash with soap and water- seek medical attention if a rash develops.		
4c	Eye contact	Wash immediately with water-seek attention if discomfort continues.		
4d	Ingestion	No adverse effects expected for small amounts, larger amounts can cause stomach irritation. Seek medical attention if discomfort occurs.		
Sec	tion 5: Fire Fighting Measures			
5a	Flammability	NFPA Fire rating = 1		
5b	Extinguishing media	Water, CO2, foam, dry powder		
5c	Fire fighting Procedures	Follow general fire fighting procedures indicated in the work place.		
5d	Protective Equipment	MSHA/NIOSH approved self-contained breathing gear, full protective clothing.		
5e	Combustion Products	Carbon oxides and other toxic gasses and vapors.		
5f	Unusual Hazards	Product is not combustible until moisture is removed. Resin begins to burn at approximately 230° C. Auto ignition can occur above 500° C.		



Sec	Section 6: Accidental Release Measures				
6a	Personal Precautions	Keep people away, spilled resin can be a slipping hazard, wear gloves and safety glasses to minimize skin or eye contact.			
6b	Incompatible Chemicals	Strong oxidants can create risk of combustion products similar to burning.			
6c	Environmental Precautions	Keep out of public sewers and waterways.			
6d	Containment Materials	Use plastic or paper containers.			
6e	Methods of Clean-up	Sweep up material and transfer to containers.			
Sec	tion 7: Handling and Storage				
7a	Handling	Avoid prolonged skin contact. Keep resin moist and avoid allowing resin to completely dry.			
7b	Storage	Store in a cool dry place (0° to 45° C) in the original shipping container. This product is thermally sensitive and will have reduced shelf life if subjected to extended periods of time at temperatures exceeding 50° C. Although freezing does not usually damage ion exchange resins, avoid repeated freeze thaw cycles.			

Section 8:	Exposure (Controls/P	'ersonal i	Protection
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8a	OSHA exposure limits	None noted.
	•	

8b Engineering Controls Provide adequate ventilation.

8c Personal Protection Measures

Eye Protection Safety glasses or goggles.
Respiratory Protection Not required for normal use.

Protective Gloves Recommended for extended contact.



Section 9: Physical and Chemical Properties

Appearance Light cream to light yellow beads approx.

0.6 mm diameter.

Flammability or explosive limits Flammable above 500° C

Odor Little or no odor

Physical State Solid

Vapor pressure Not available
Odor threshold Not available
Vapor density Not available
pH Near neutral

Relative density Approx 680 grams/Liter

Melting point/freezing point Does not melt, freezes at approx. 0 C
Solubility Insoluble in water and most solvents

Boiling point Does not boil
Flash point Approx 500° C

Evaporation rate Does not evaporate

Partition Coefficient (n-octonol/water)

Auto-ignition temperature

Decomposition temperature

Viscosity

Not applicable

Approx 500° C

Above 230° C

Not applicable

Section 10: Stability and Reactivity

10a Stability Stable under normal conditions.

10b Conditions to Avoid Heat, exposure to strong oxidants.

10c Hazardous by-products

Tributylamine, charred polystyrene, aromatic acids

and hydrocarbons, organic amines, nitrogen oxides, carbon oxides, chlorinated hydrocarbons.

exidee, earborr exidee, ernermated rijareearber

10d Incompatible materials Strong oxidizing agents (such as HNO₃).

10e Hazardous Polymerization Does not occur



Section 11: Toxicological Information

11a Likely Routes of Exposure Oral, skin or eye contact.

11b Effects of exposure

Delayed None known.
Immediate (acute) None known.
Chronic None known.

11c Toxicity Measures

Skin Adsorption Unlikely.

Ingestion Oral toxicity believed to be low but no LD50 has

been established.

Inhalation Unknown, vapors are very unlikely due to physical

properties (insoluble solid).

11d Toxicity Symptoms

Skin Adsorption Mild rash.

Ingestion Indigestion or general malaise.

Inhalation Unknown.

11e Carcinogenicity None known

Section 12: Ecological information

12a Eco toxicity Not harmful to plant or animal life.

12b Mobility Insoluble.

12c Biodegradability Not biodegradable.

12d Bioaccumulation Insignificant.

12e Other adverse effects Not Harmful to the environment.



Section 13: Disposal Considerations				
13a General considerations	Material is non-hazardous.			
13b Disposal Containers	3b Disposal Containers Most plastic and paper containers are suitable.			
13c Disposal methods	No specific method necessary.			
13d Sewage Disposal	Not recommended.			
13e Precautions for incineration	May release tributylamine and toxic vapors when burned.			
13f Precautions for landfills	Resins used to remove hazardous materials may then become hazardous mixtures			
Section 14: Transportation Information				
14a Transportation Class	Not classified as a dangerous good for transport by land, sea, or air.			
14b TDG	Not regulated.			
14c IATA	Not regulated.			
14d DOT (49 CFR 172.101)	4d DOT (49 CFR 172.101) Not Regulated.			
Section 15: Regulatory Information				
15a CERCLA	Not regulated			
15b SARA Title III	Not regulated			
15c Clean Air act	Not regulated			
15d Clean Water Act	Not regulated			
15e TSCA	Not regulated			
15f Canadian Regulations WHMIS TDG	Not a controlled product Not regulated			
15g Mexican Regulations	Not Dangerous			



Section 16: Other Information

The information provided in this safety data sheet is presented in good faith and believed to be accurate as of the effective data shown above. However, no warranty or guarantee of accuracy, express or implied is given. Regulatory requirements are subject to change and may differ from one location to another. It is the buyer's responsibility to ensure that their activities comply with federal, state, and local laws.

16a Date of Revision 31 March 2015



Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application Outfall 13S Fact Sheet

Utilities and Infrastructure (U&I)
Sanitary Wastewater System (SWWS) Facility







Table of Contents

1.0	OUTFALL LOCATION [Section I]	5
2.0	FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]	5
2.1	Process Schematic and Water Balance [II.A]	5
2.2	Water Treatment Processes [II.B]	5
2.3	Discharge Rate and Frequency [II.C]	7
3.0	PRODUCTION [Section III]	7
4.0	IMPROVEMENTS [Section IV]	7
5.0	INTAKE AND EFFLUENT CHARACTERISTICS [Section V]	7
5.1	Analytical Data [V.A, B, and C]	7
5.2	Potential Pollutants [V.D]	8
6.0	POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]	9
7.0	BIOLOGICAL TOXICITY TESTING DATA [Section VII]	9
8.0	CONTRACT ANALYSIS INFORMATION [Section VIII]	9
	CHMENT A: Location Map for Outfall 13S	
ATTAC	CHMENT B: Process Schematic and Water Balance for Outfall 13S	B-1
ATTAC	CHMENT C: Photographs	C-1
ATTAC	CHMENT D: Safety Data Sheets	D-1

List of Tables

- 1 Sources for Discharges to Outfall 13S
- 2 Wastewater Treatment Codes Assigned to Outfall 13S
- 3 List of Treatment Chemicals used in the Operations that Contribute to Outfall 13S
- 4 Flow Rates and Frequencies for Discharges to Outfall 13S
- 5 Potential Pollutants by Source for Outfall 13S
- 6 List of Independent Laboratories Used for NPDES Water Analysis





INDUSTRIAL AND SANITARY OUTFALLS 2019 NPDES PERMIT RE-APPLICATION OUTFALL 13S FACT SHEET

1.0 OUTFALL LOCATION [Section I]

Outfall ID No.:	13S	Outfall Location:	Technical Area 46
Category:	Sanitary Wastewater	Originating Structure for the	TA-46-333, 334, 336, 335, 337, 338, 340,
	Discharges	Discharge: 347, 375, 431, and 477; Sanitary	
		Wastewater System (SWWS) Treatr	
			Facility
Flow Type:	Intermittent	Receiving Stream: Canada del Buey, Ephemeral Rea	
			Water Quality Segment 20.6.4.128 NMAC
Longitude:	106° 16' 33" W	Latitude:	35° 51' 08" N

2.0 FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]

Outfall 13S is located at TA-46 and discharges to Canada del Buey, an ephemeral reach in Water Quality Segment 20.6.4.128 NMAC. The outfall is capable of discharging treated sanitary wastewater effluent from the Sanitary Wastewater System (SWWS) Facility. Attachment A provides a location map. Table 1 identifies the discharge source, source location, and source composition.

	Table 1					
			Sources for Discharges	s to Outfall 13S		
TA	Building	Source	Transportation Mode	Discharge	Source	
		Type	(Piping, Truck etc.)	Source	Composition	
46	333, 334, 336, 335,	Sanitary	Piping	SWWS Facility	Treated SWWS Effluent	
	337, 338, 340, 347,			-		
	375, 431, 477					
SWW	/S = Sanitary Wastewater	System				

2.1 Process Schematic and Water Balance [II.A]

A process schematic line drawing that shows the outfall source and route taken by water is provided in Attachment B. This drawing includes all operations that contribute process water, sanitary water, and cooling water to the SWWS Facility and subsequently the discharge at Outfall 13S. It also includes a water balance based upon data collected from operations personnel.

2.2 Water Treatment Processes [II.B]

Sanitary Wastewater System (SWWS): The SWWS Facility treats sanitary wastewater, process water (i.e., laboratory rinse water, reverse osmosis concentrate, industrial water) and cooling water (i.e., once through cooling water, cooling tower blowdown) discharged to the sanitary sewer and/or collected in storage containers/tanks from all technical areas at the Laboratory. All wastewater discharged to the SWWS Facility for treatment must comply with the facility's Waste Acceptance Criteria and, if it is something other than sanitary waste (i.e., cooling water, process water), must have a completed/approved Waste Stream Profile Form. The following bullets summarize the treatment process at the SWWS Facility.

- 1. Wastewater flows to the SWWS Facility by gravity through the collection system and into a mechanical Bar Screen that is used to remove large inert solids (i.e., gloves, mop strings, paper towels, sand, asphalt, gravel) from the wastewater prior to treatment. This protects the pumps, valves, pipelines, and other downstream appurtenances from damage and/or clogging.
- 2. The screened wastewater from the mechanical bar screen is routed through a Grit Chamber to remove heavy suspended solids such as sand, gravel, seeds, and coffee grounds from the wastewater. Wastewater from the grit chamber is routed to a splitter box where glycerin and soda ash are added. The glycerin is used to provide a carbon food source to the microorganisms and the soda ash is used to adjust the alkalinity. The wastewater from the splitter box is routed to the Equalization Basins (2) to stabilize the flow of wastewater being treated through the facility.



- 3. Wastewater from the Equalization Basins (2) is routed to the Aeration Basins (4) and sparged/mixed with air at different rates to mix the water with microorganisms and promote biological growth. Dog food is added to the Aeration Basis to promote microorganism health and growth as needed. From the Aerations Basins the wastewater is routed to the Secondary Clarifiers. At this time, one clarifier is being used as a Digester (for waste microorganisms) and the second is used as a Clarifier.
- 4. Clarified water is routed to the Chlorine Contact Chamber to be disinfected. The chlorine is generated by a mixed oxidant (MIOX) treatment unit that uses brine water and electrophoresis to create a mixed oxidant solution that is used for disinfection.
- 5. Disinfected water is discharged from the chlorine contact chamber to the Effluent Holding Pond for storage until it can be pumped to the Reuse Tank at the Power Plant or discharged to Outfall 13S.
- 6. Disinfected water that is discharged to an outfall is disinfected as follows:
 - Disinfected water pumped to the Reuse Tank is dechlorinated at the Power Plant Manhole A as it is discharged to Outfall 001.
 - Disinfected water is de-chlorinated at SWWS as it is discharged to Outfall 13S. This ONLY takes place if it
 is discharged to the outfall.
- 7. Secondary wastewater, sludge, debris, and solids generated due to treatment at the SWWS Facility are managed as follows:
 - Solids from the bar screen and grit chamber are removed and disposed of at an approved landfill.
 - Waste sludge (from the clarifier and/or digester) is mixed with a polymer to help flocculate the sludge into large pieces, and discharged to the sludge drying beds. Decanted water from the digester and/or sludge drying beds is recycled to the head works for treatment. Dried sludge is either composted and land applied or packaged into roll off bins and shipped to an approved landfill.

NOTE: The land application of compost (biosolids) at LANL is subject to 40 CFR Part 503 Subpart B and Part IV of LANL's NPDES Industrial Outfall Permit NM0028355 — Sewage Sludge Requirements. Biosolids applied to land must meet risk-based pollutant limits specified in Part 503. Operational standards to control disease-causing organisms (pathogens) and reduce the attraction of vectors (e.g., flies and mosquitoes) to biosolids must also be met. The SWWS Compost Facility is registered pursuant to the requirements in 20.9.3.27 NMAC under Certificate No. 0215151C.

Photographs for the operations at the SWWS Facility are provided in Attachment C.

	Table 2 Wastewater Treatment Codes Assigned to Outfall 13S					
Source	Treatment Code	Description	Justification			
SWWS	1-M	Grit Removal	Grit Chamber			
Facility	1-0	Mixing	Grit Chamber with Splinter Box			
	1-T	Screening	Use of Bar Screen to Remove Solids			
	1-U	Sedimentation (settling)	Sludge is Settled in Clarifier and Digester			
2-E Dechlorination		Dechlorination	Dechlorination chemical (SO2) used at SWWS if effluent is discharged to Outfall 13S			
	2-F	Disinfection (chlorine)	Chlorine is Added Using a MIOX system			
	3-A	Activated Sludge	Activated Sludge is Used to Treat Water			
	3-E	Pre-Aeration	Aeration Basins			
	5-G	Composting	Composting of Sludge			
	5-H	Drying Beds	Sludge Drying Beds on Site			
	5-Q	Landfill	Sludge is disposed of at an Approved Landfill or Land Applied.			
			Screened solids are disposed of at an approved Landfill.			

MIOX = mixed oxide; SWWS = Sanitary Wastewater System



The water treatment processes identified in Table 2 utilize chemicals to treat the sanitary wastewater prior to discharge. Table 3 provides a list of chemicals to treat the water.

		Table 3				
List of Treatment Chemicals Used in the Operations that Contribute to Outfall 13S						
Source	Chemical Name	Reason for Use Toxic Pollutant and/o Substances Table 2				
SWWS Facility	Clarifloc C-6265	Polymer Flocculation Agent	NA	NA		
	Dog Food	Food Source for Micro-organisms	NA	NA		
	Glycerin	Carbon Source for Microorganisms	NA	NA		
	Sodium Bisulfite	De-chlorination	Sodium Bisulfite	2C-4		
	Soda Ash	Add Alkalinity	NA	NA		
	Sodium Chloride	Chlorine Source for Disinfection Using the MIOX System	Chlorine	2C-4		
	Sulfur Dioxide	Dechlorination	NA	NA		
	Bright Dyes FLT	Water Line & Drain Tracing Dye	NA	NA		
	Yellow/Green Liquid					
	Bright Dyes FLT	Water Line & Drain Tracing Dye	NA	NA		
	Yellow/Green Tablet					
MIOX = mixed oxid	e; NA = not applicable; SWW	S = Sanitary Wastewater System	·	_		

2.3 Discharge Rate and Frequency [II.C]

The discharge rates and frequencies for Outfall 13S are provided in Table 4.

Table 4 Flow Rates and Frequencies for Discharges to Outfall 13S							
Source.	Frequency		Flow Rates and Volumes				
	Days/Week	Months	Average (MGD)	Maximum (MGD)	Average Volume (GPD)	Maximum Volume (GPD)	Duration (days)
SWWS Facility a, b	7.0	12	0.229	0.418	228,808	418,000	365

- Calculated between October 2017 and September 2018.
- b. Assumes that no effluent will be routed to the Reuse Tank at TA-3 for recycling to the SERF.

GPD = gallons per day; MGD = million gallons per day; SWWS = Sanitary Wastewater System

3.0 PRODUCTION [Section III]

Section III is not applicable to Outfall 13S.

4.0 IMPROVEMENTS [Section IV]

Section IV is not applicable to Outfall 13S.

5.0 INTAKE AND EFFLUENT CHARACTERISTICS [Section V]

5.1 Analytical Data [V.A, B, and C]

The analytical results provided for the Outfall 13S Permit Reapplication on the Form 2C were provided from the following sources:

- Operational Samples collected on September 19 20, 2018 and shipped to an independent laboratory for analysis.
- Field samples collected and analyzed on September 19 20, 2018 for residual chlorine and pH.
- Field samples collected and analyzed on February 22, 2019 for sulfite.
- Hardness = 73.6 mg/L (CaCO₃)



A discharge monitoring report summary is not provided for Outfall13S because the effluent from SWWS Facility was not discharged to Canada de Buey between October 2014 and September 2018. Effluent from the SWWS Facility is routed to the Reuse Tank at the power plant.

5.2 Potential Pollutants [V.D]

The treatment chemicals associated with the SWWS Facility constitutes the pollutant load of the discharge to Outfall 13S. Table 5 identifies the Table 2C-3 and 2C-4 pollutants associated with the SWWS Facility effluent. It also identifies those pollutants (if any) that were detected in the analytical results from the samples collected for the 2019 Permit Renewal Application. The safety data sheets associated with the chemicals used to treat water at the SWWS Facility are provided in Attachment F.

Table 5 Potential Pollutants by Source for Outfall 13S					
Source	POTENTIAL	Analytical Data Results from			
	Toxic Pollutant and/or Hazardous Table 2C-3 or 2C-4	Operational Samples Collected for Outfall 13S ^a			
SWWS Facility Treatment	Chlorine	2C-4	Residual chlorine = 1.62 mg/L		
Chemicals	Sodium Bisulfite	2C-4	Sulfite was not detected.		
• · · · · · · · · · · · · · · · · · · ·		2C-4 2C-4			
SWWS Facility chemicals identified on Influent Waste	Acetic Acid Acetone	2C-4 2C-4	pH = 7.5 to 7.7 S.U. Not Analyzed ^c		
Stream Profile Forms		2C-4 2C-4	,		
Stream Profile Forms	Ammonia		0.215 mg/L		
	Aniline	2C-3 & 2C-4	Not Analyzed ^c		
	Benzene	2C-4	0.68 ug/L		
	Benzoic Acid	2C-4	pH = 7.5 to 7.7 S.U.		
	Calcium Hypochlorite	2C-4	Chloride = 45.5 mg/L		
	Carbon Disulfide	2C-3 & 2C-4	Not Analyzed ^c		
	Chlorine	2C-4	Residual Chlorine = 0		
	Chloroform	2C-4	20.2 ug/L		
	Cresol	2C-3 & 2C-4	Not Analyzed ^c		
	Ethylbenzene	2C-4	Not Detected (VOC)		
	Polychlorinated Biphenyls ^b	2C-4	Not Detected		
	Phenol	2C-4	2.21 ug/L		
	Phosphoric Acid	2C-4	pH = 7.5 to 7.7 S.U. Total Phosphorus = 3.12 mg/L		
	Potassium Hydroxide	2C-4	pH = 7.5 to 7.7 S.U.		
	Sodium	2C-4	Not Analyzed ^c		
	Sodium Bisulfite	2C-4	Sulfite was not detected.		
	Sodium Hydroxide	2C-4	pH = 7.5 to 7.7 S.U.		
	Sodium Hypochlorite	2C-4	Chloride = 45.5 mg/L		
	Sodium Nitrite	2C-4	Nitrate/Nitrite = 0.991 mg/L		
	Strontium	2C-3	Not Analyzed ^c		
	Styrene	2C-3 & 2C-4	Not Analyzed ^c		
	Toluene	2C-4	Not Detected (VOC)		
	Uranium	2C-3	Not Analyzed ^c		
	Vanadium	2C-3	Not Analyzed ^c		
	Variation	20-0	140t/tilalyZou		

a. Results are from operational samples collected at the chlorine contact chamber at the SWWS Facility. These samples are representative of the SWWS effluent after final treatment and the potential discharge to Outfall 13S. Currently the effluent from SWWS Facility is routed to the Reuse Tank at the Power Plant for either treatment at SERF and use at the SCC or discharge to Outfall 001.

PCB = polychlorinated biphenyls; SCC = Strategic Computing Center; SERF = Sanitary Effluent Reclamation Facility; SVOC = semi-volatile organic compounds; S.U. = Standard Units; SWWS = Sanitary Wastewater System; VOC = Volatile Organic Compound

b. Results were obtained using the EPA Aroclor Method 608.3 as required by the Form 2C. Low concentrations of PCBs have been detected in the waters discharged for treatment at SWWS Facility and in the discharged to Outfall 001 using the Congener Method.

c. The potential pollutant was not analyzed because it is not specifically called out on the Form 2C.



6.0 POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]

Section VI is not applicable to Outfall 13S.

7.0 BIOLOGICAL TOXICITY TESTING DATA [Section VII]

Section VII is not currently applicable to Outfall 13S.

8.0 CONTRACT ANALYSIS INFORMATION [Section VIII]

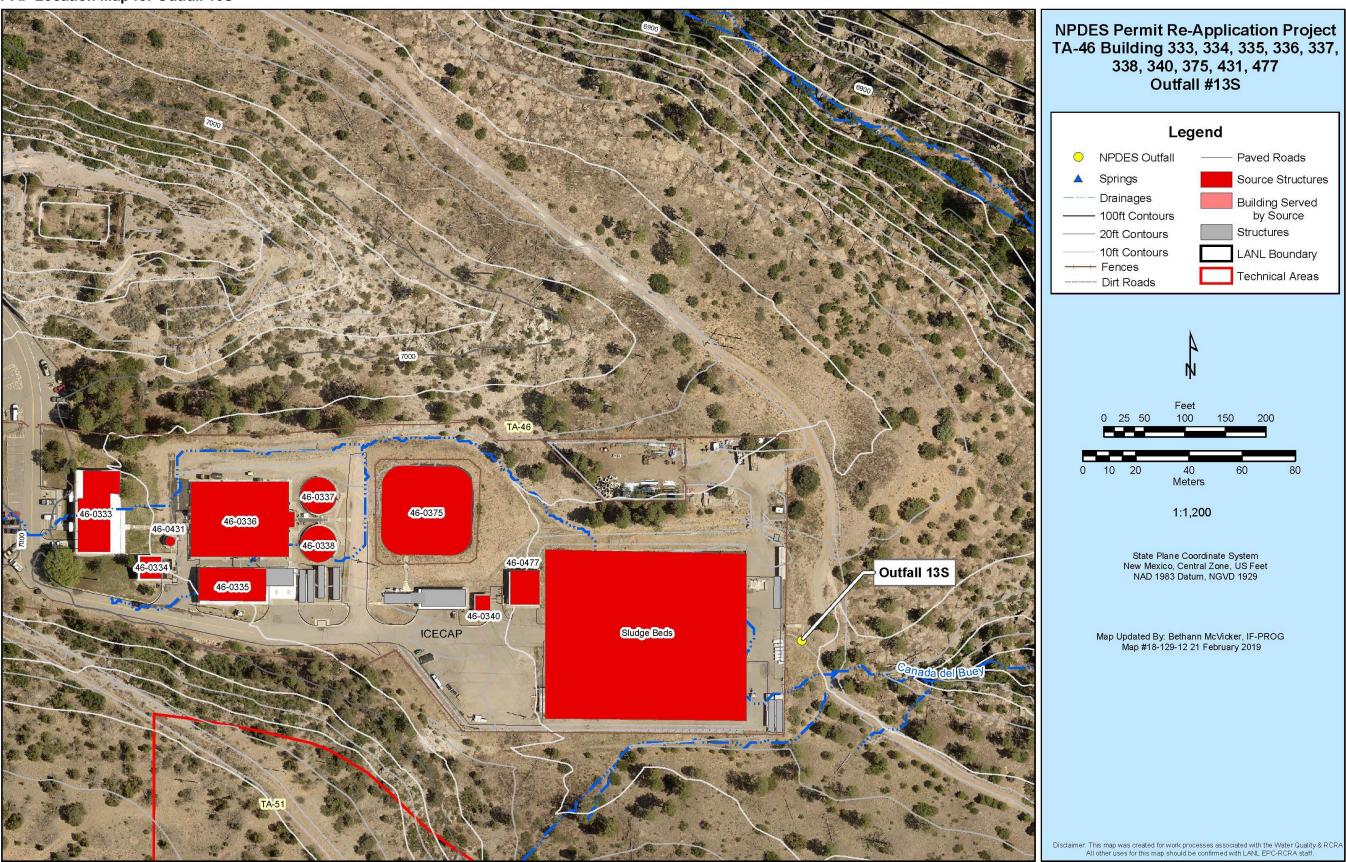
Operational samples (not for use to demonstrate compliance to the existing permit) of the SWWS effluent were collected at the Chlorine Contact Chamber on September 19 – 20, 2018 for the Form 2C constituents required by the permit application forms. These samples were submitted to independent laboratories identified in Table 6 as discussed in Section 5.1.

Table 6 List of Independent Laboratories Used for NPDES Water Analysis					
Laboratory Name	Address and Contact Info	Analytical Parameters			
GEL Laboratories LLC	2040 Savage Road Charleston SC 29407 (843) 556-8171	Biological Oxygen Demand, General Chemistry, Pesticides, Polychlorinated Biphenyls, Radiochemistry, Semi-Volatile Organic Compounds, Total Metals, Total Suspended Solids, Volatile Organic Compounds			
New Mexico Water Testing Laboratory, Inc.	401 North Coronado Ave Espanola, NM 87532 (505) 929-4545	E.coli			
Cape Fear Analytical LLC	3306 Kitty Hawk Road Suite 120 Wilmington, NC 28405 (910) 795-0421	TCDD (Dioxin)			





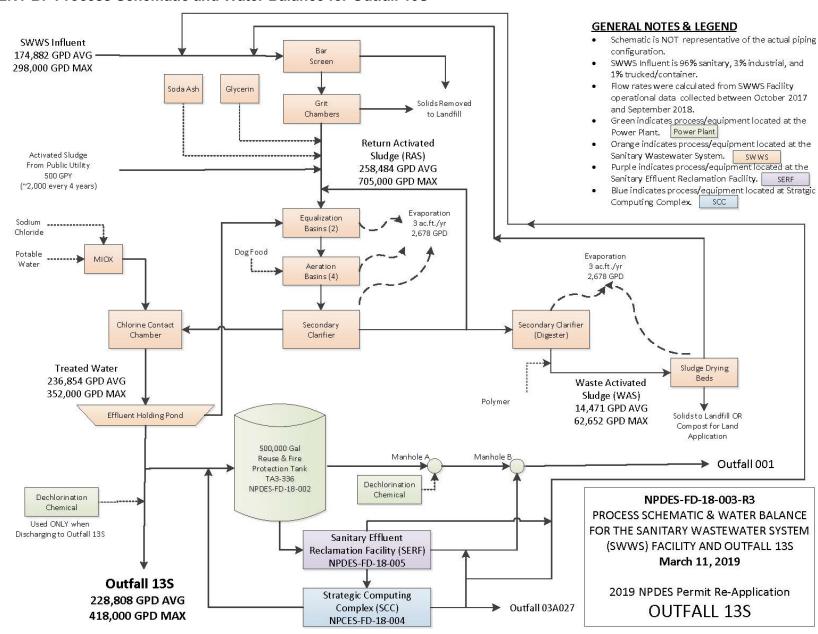
ATTACHMENT A: Location Map for Outfall 13S







ATTACHMENT B: Process Schematic and Water Balance for Outfall 13S







ATTACHMENT C: Photographs

Photograph ID No.	Photograph Title
NPDES-13S-18-001	Outfall 13S Location in Canada del Buey
NPDES-13S-18-002	Outfall 13S Condition
NPDES-13S-18-003	Outfall 13S Receiving Stream Canada Del Buey, Water Quality Segment Number 20.6.4.128 NMAC
NPDES-13S-18-004	Outfall 13S Ability to Collect Representative Operational Samples at the Chlorine Contact Chamber
NPDES-13S-18-005	Outfall 13S Ability to Collect Representative Compliance Samples at the Outfall
NPDES-13S-18-006	Sanitary Wastewater System (SWWS) Facility
NPDES-13S-18-007	SWWS Bar Screen at the Headworks
NPDES-13S-18-008	SWWS Grit Chamber
NPDES-13S-18-009	SWWS Glycerin Feed System
NPDES-13S-18-010	SWWS Soda Ash Feed System
NPDES-13S-18-011	SWWS Equalization Basins
NPDES-13S-18-012	SWWS Aeration Basins
NPDES-13S-18-013	SWWS Clarifier
NPDES-13S-18-023	SWWS Digester
NPDES-13S-18-014	SWWS Chorine Contact Chamber
NPDES-13S-18-015	SWWS MIOX System Tank
NPDES-13S-18-016	SWWS Sludge Polymer Feed
NPDES-13S-18-017	SWWS Effluent Holding Pond
NPDES-13S-18-018	SWWS Reuse Pumps and Chlorine Analyzer
NPDES-13S-18-019	SWWS Sludge Drying Bed Winrow Composting
NPDES-13S-18-020	SWWS Sludge Drying Beds
NPDES-13S-18-021	SWWS Sludge Composting Structure
NPDES-13S-18-022	SWWS Finished Compost

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application





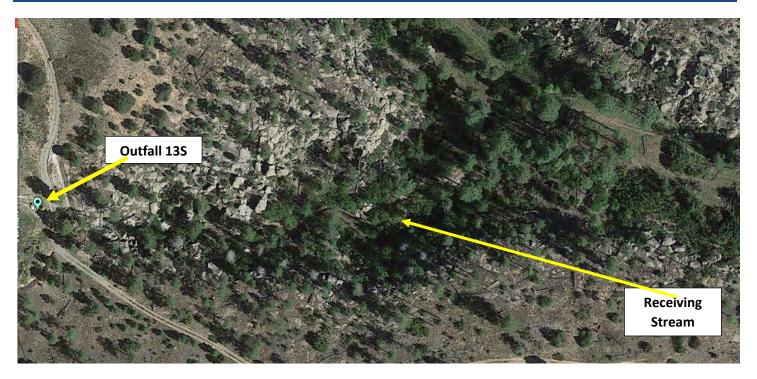


Photograph - NPDES-13S-18-001
Outfall 13S Location in Canada del Buey



Photograph - NPDES-13S-18-002 Outfall 13S Condition





Photograph - NPDES-13S-18-003
Outfall 13S Receiving Stream Canada Del Buey, Water Quality Segment Number 20.6.4.128 NMAC



Photograph - NPDES-13S-18-004
Outfall 13S Ability to Collect Representative Operational Samples at the Chlorine Contact Chamber





Photograph - NPDES-13S-18-005
Outfall 13S Ability to Collect Representative Compliance Samples at the Outfall



Photograph - NPDES-13S-18-006 Sanitary Wastewater System (SWWS) Facility





Photograph - NPDES-13S-18-007 SWWS Bar Screen at the Headworks



Photograph - NPDES-13S-18-008 SWWS Grit Chamber





Photograph - NPDES-13S-18-009 SWWS Glycerin Feed System



Photograph - NPDES-13S-18-0010 SWWS Soda Ash Feed System





Photograph - NPDES-13S-18-0011 SWWS Equalization Basins



Photograph - NPDES-13S-18-0012 SWWS Aeration Basins





Photograph - NPDES-13S-18-013 SWWS Clarifier

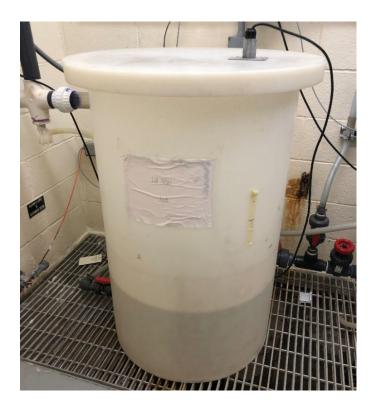


Photograph - NPDES-13S-18-023 SWWS Digester





Photograph - NPDES-13S-18-014 SWWS Chlorine Contact Chamber



Photograph - NPDES-13S-18-015 SWWS MIOX System Tank





Photograph - NPDES-13S-18-016 SWWS Sludge Polymer Feed Tank



Photograph - NPDES-13S-18-017 SWWS Effluent Holding Pond





Photograph - NPDES-13S-18-018 SWWS Reuse Pumps and Chlorine Analyzer



Photographs - NPDES-13S-18-019
SWWS Sludge Drying Bed Winrow Composting





Photograph - NPDES-13S-18-020 SWWS Sludge Drying Beds



Photograph - NPDES-13S-18-021 SWWS Sludge Composting Structure





Photograph - NPDES-13S-18-022 SWWS Finished Compost



ATTACHMENT D: Safety Data Sheets

SANILIST OF SAFETY DATA SHEETS
Clarifloc C-6265
Dog Food
Glycerin
Sodium Bisulfite
Soda Ash [Na ₂ CO ₃]
Sodium Chloride
Sulfur Dioxide
Bright Dyes FLT Yellow/Green Liquid
Bright Dyes FLT Yellow/Green Tablet



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CLARIFLOC C-6265



CLARIFLOC™ C-6265

Hazard symbol(s):

None.

Signal word:

None.

Hazard statement(s):

None.

Precautionary statement(s):

None.

2.3. Other hazards

Spills produce extremely slippery surfaces.

For explanation of abbreviations see Section 16.

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable, this product is a mixture.

3.2. Mixtures

This product is a mixture.

Hazardous components

Distillates (petroleum), hydrotreated light

Concentration/ -range:

20 - 30%

CAS Number:

64742-47-8

Classification according to paragraph (d)

Asp. Tox. 1;H304

of 29 CFR 1910.1200:

Notes

Does not result in classification of the mixture if the kinematic viscosity is greater than 20.5 mm²/s measured at 40°C.

Poly(oxy-1,2-ethanediyl), a-tridecyl-w-hydroxy-, branched

Concentration/-range:

< 5%

CAS Number:

69011-36-5

Classification according to paragraph (d)

classification according to paray

Acute Tox. 4;H302, Eye Dam. 1;H318

of 29 CFR 1910.1200:

For explanation of abbreviations see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

Print Date:

12/07/2018

Revision date: 06/14/2018

Page: 2 / 14



CLARIFLOC™ C-6265

Personal precautions:

Do not touch or walk through spilled material. Spills produce extremely slippery surfaces.

Protective equipment:

Wear adequate personal protective equipment (see Section 8 Exposure Controls/Personal Protection).

Emergency procedures:

Keep people away from spill/leak. Prevent further leakage or spillage if safe to do so.

6.2. Environmental precautions

As with all chemical products, do not flush into surface water.

6.3. Methods and material for containment and cleaning up

Small spills:

Do not flush with water. Soak up with inert absorbent material. Sweep up and shovel into suitable containers for disposal,

Large spills:

Do not flush with water. Dam up. Clean up promptly by scoop or vacuum.

Residues:

Soak up with inert absorbent material. After cleaning, flush away traces with water.

6.4. Reference to other sections

SECTION 7: Handling and storage; SECTION 8: Exposure controls/personal protection; SECTION 13: Disposal considerations;

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Avoid contact with skin and eyes. Renders surfaces extremely slippery when spilled. When using, do not eat, drink or smoke.

7.2. Conditions for safe storage, including any incompatibilities

Keep away from heat and sources of ignition. Freezing will affect the physical condition and may damage the material. Incompatible with oxidizing agents.

7.3. Specific end use(s)

This information is not available.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits:

Print Date:

12/07/2018

Revision date: 06/14/2018

Page: 4 / 14



CLARIFLOC™ C-6265

i) Upper/lower flammability or explosive limits:

2.3 kPa @ 20°C

k) Vapour pressure:

0.804 g/litre @ 20°C

Not expected to create explosive atmospheres.

I) Vapour density:m) Relative density:

1.0 - 1.2

n) Solubility(ies):

Completely miscible.

o) Partition coefficient:

Not applicable.

p) Autoignition temperature:

Not applicable.

q) Decomposition temperature:

> 150°C

r) Viscosity:

> 20.5 mm²/s @ 40°C

s) Explosive properties:

Not expected to be explosive based on the chemical structure.

t) Oxidizing properties:

Not expected to be oxidising based on the chemical structure.

9.2. Other information

None.

SECTION 10: Stability and reactivity

10.1. Reactivity

Stable under recommended storage conditions.

10.2. Chemical stability

Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

Oxidizing agents may cause exothermic reactions.

10.4. Conditions to avoid

Protect from frost, heat and sunlight.

10.5. Incompatible materials

Oxidizing agents.

10.6. Hazardous decomposition products

Thermal decomposition may produce: hydrogen chloride gas, nitrogen oxides (NOx), carbon oxides (COx). Ammonia. Hydrogen cyanide (hydrocyanic acid).

SECTION 11: Toxicological information

Print Date:

12/07/2018

Revision date: 06/14/2018

Page: 6 / 14



CLARIFLOC™ C-6265

STOT - Single exposure:

No known effects.

STOT - Repeated exposure:

NOAEL/oral/rat/90 days >= 3000 mg/kg/day (OECD 408) (Based on results obtained

from tests on analogous products)

Aspiration hazard:

May be fatal if swallowed and enters airways.

Poly(oxy-1,2-ethanediyl), a-tridecyl-w-hydroxy-, branched

Acute oral toxicity:

LD50/oral/rat = 500 - 2000 mg/kg

Acute dermal toxicity:

LD50/dermal/rabbit > 2000 mg/kg.

Acute inhalation toxicity:

No data available.

Skin corrosion/irritation:

Not irritating. (OECD 404)

Serious eye damage/eye irritation:

Causes serious eye irritation. (OECD 405)

Respiratory/skin sensitisation:

The results of testing on guinea pigs showed this material to be non-sensitizing.

Mutagenicity:

Not mutagenic.

Carcinogenicity:

Not carcinogenic.

Reproductive toxicity:

Two-Generation Reproduction Toxicity (OECD 416)

- NOAEL/rat > 250 mg/kg/day

Prenatal Development Toxicity Study (OECD 414)
- NOAEL/Maternal toxicity/rat > 50 mg/kg/day
- NOAEL/Developmental toxicity/rat > 50 mg/kg/day

STOT - Single exposure:

No known effects.

STOT - Repeated exposure:

NOAEL/oral/rat/600 days = 50 mg/kg/day

Aspiration hazard:

No known effects.

SECTION 12: Ecological information

12.1. Toxicity

Information on the product as supplied:

Acute toxicity to fish:

LC50/Fish/96 hours = 10 - 100 mg/L (Estimated)

Acute toxicity to invertebrates:

EC50/Daphnia magna/48 hours = 10 - 100 mg/L. (Estimated)

Acute toxicity to algae:

Algal inhibition tests are not appropriate. The flocculation characteristics of the product interfere directly in the test medium preventing homogenous distribution which

invalidates the test.

Chronic toxicity to fish:

No data available.

Print Date:

12/07/2018

Revision date: 06/14/2018

Page: 8 / 14



CLARIFLOC™ C-6265

Degradation:

Readily biodegradable.

Hydrolysis:

At natural pHs (>6) the polymer degrades due to hydrolysis to more than 70% in 28

days. The hydrolysis products are not harmful to aquatic organisms.

Photolysis:

No data available.

Relevant information on the hazardous components:

Distillates (petroleum), hydrotreated light

Degradation:

Readily biodegradable. 67.6% / 28 days (OECD 301 F); 68.8% / 28 days (OECD

306); 61.2% / 61 days (OECD 304 A)

Hydrolysis:

Does not hydrolyse.

Photolysis:

No data available.

Poly(oxy-1,2-ethanediyl), a-tridecyl-w-hydroxy-, branched

Degradation.

Readily biodegradable. > 60% / 28 days (OECD 301 B)

Hydrolysis:

Does not hydrolyse.

Photolysis:

No data available.

12.3. Bioaccumulative potential

Information on the product as supplied:

The product is not expected to bioaccumulate.

Partition co-efficient (Log Pow):

Not applicable.

Bioconcentration factor (BCF):

No data available.

Relevant information on the hazardous components:

Distillates (petroleum), hydrotreated light

Partition co-efficient (Log Pow):

3 - 6

Bioconcentration factor (BCF):

No data available.

Poly(oxy-1,2-ethanediyl), a-tridecyl-w-hydroxy-, branched

Partition co-efficient (Log Pow):

> 3

Bioconcentration factor (BCF):

No data available.

Print Date:

12/07/2018

Revision date: 06/14/2018

Page: 10 / 14



CLARIFLOC™ C-6265

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Information on the product as supplied:

TSCA Chemical Substances Inventory:

All components of this product are either listed on the inventory or are exempt from listing.

US SARA Reporting Requirements:

SARA (Section 311/312) hazard class:

Not concerned.

SARA Title III Sections:

Section 302 (TPQ) - Reportable Quantity:

Not concerned.

Section 304 - Reportable Quantity:

Not concerned.

Section 313 (De minimis concentration):

Not concerned.

Clean Water Act

Section 311 Hazardous Substances (40 CFR 117.3) - Reportable Quantity:

Not concerned.

Clean Air Act

Section 112(r) Accidental release prevention requirements (40 CFR 68) - Reportable Quantity:

Not concerned.

CERCLA

Hazardous Substances List (40 CFR 302.4) - Reportable Quantity:

Not concerned.

RCRA status:

Not RCRA hazardous.

California Proposition 65 Information:

WARNING! This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm, Acrylamide

Print Date:

12/07/2018

Revision date: 06/14/2018

Page: 12 / 14



CLARIFLOC™ C-6265

U.S. Code of Federal Regulations 29 CFR 1910.1200

Version: 17.01.a

ENCC046

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Print Date:

12/07/2018

Revision date: 06/14/2018

Page: 14 / 14



GLYCERIN/GLYCEROL





Revision Date 23-Jan-2018 Creation Date 07-Jan-2010 Revision Number 11

1. Identification

Product Name Glycerol

AC410980000; AC410980025; AC410980100; AC410985000 Cat No.:

CAS-No 56-81-5 Synonyms Glycerine

Recommended Use Laboratory chemicals.

Not for food, drug, pesticide or biocidal product use Uses advised against

Details of the supplier of the safety data sheet

<u>Company</u> Fisher Scientific Acros Organics One Reagent Lane One Reagent Lane Fair Lawn, NJ 07410 Fair Lawn, NJ 07410 Tel: (201) 796-7100

Emergency Telephone Number

For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11 Emergency Number US:001-201-796-7100 / Europe: +32 14 57 52 99 CHEMTREC Tel. No. US:001-800-424-9300 / Europe:001-703-527-3887

2. Hazard(s) Identification

Classification

Classification under 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Based on available data, the classification criteria are not met

Label Elements

None required

Hazards not otherwise classified (HNOC)

None identified

	The second control of	The second control of
	formation on	

Component	CAS-No	Weight %
Glycerin	56-81-5	>95

4. First-aid measures

Page 1/6



Glycerol Revision Date 23-Jan-2018

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get

medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Get medical attention

immediately if symptoms occur.

Inhalation Move to fresh air. Get medical attention immediately if symptoms occur.

Ingestion Clean mouth with water and drink afterwards plenty of water. Get medical attention if

symptoms occur.

Most important symptoms and

effects

None reasonably foreseeable.

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable Extinguishing Media No information available

Flash Point 160 °C / 320 °F

Method - No information available

Autoignition Temperature 400 °C / 752 °F

Explosion Limits

Upper No data available Lower 1.1 vol %

Sensitivity to Mechanical Impact No information available Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical

Keep product and empty container away from heat and sources of ignition.

Hazardous Combustion Products

Thermal decomposition can lead to release of irritating gases and vapors

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

HealthFlammabilityInstabilityPhysical hazards111N/A

6. Accidental release measures

Personal Precautions Use personal protective equipment. Ensure adequate ventilation.

Environmental Precautions Should not be released into the environment.

Methods for Containment and Clean Sweep up or vacuum up spillage and collect in suitable container for disposal.

Up

	7. Handling and storage					
Handling	Wear personal protective equipment. Ensure adequate ventilation. Avoid contact with skin,					
	eyes and clothing. Avoid ingestion and inhalation.					

Storage Keep containers tightly closed in a dry, cool and well-ventilated place. To maintain product

quality, do not store in heat or direct sunlight. Protect from moisture. Do not freeze.

Page 2/6



Glycerol Revision Date 23-Jan-2018

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Glycerin		(Vacated) TWA: 10 mg/m³ (Vacated) TWA: 5 mg/m³ TWA: 15 mg/m³		TWA: 10 mg/m³
		TWA: 5 mg/m ³		

Legend

ACGIH - American Conference of Governmental Industrial Hygienists

OSHA - Occupational Safety and Health Administration

Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations **Engineering Measures**

and safety showers are close to the workstation location.

Personal Protective Equipment

Eyelface Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by

OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard

Wear appropriate protective gloves and clothing to prevent skin exposure. Skin and body protection

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard

EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Handle in accordance with good industrial hygiene and safety practice. Hygiene Measures

9. Physical and chemical properties

Physical State Very viscous Liquid

Appearance Clear Odor Slight

Odor Threshold No information available 5 100 g/L aq.sol рΗ Melting Point/Range 18 °C / 64.4 °F 290 °C / 554 °F Boiling Point/Range 160 °C / 320 °F Flash Point

Evaporation Rate No information available Flammability (solid,gas) Not applicable

Flammability or explosive limits

No data available Upper 1.1 vol %

Lower Vapor Pressure 0.003 mbar @ 50 °C

Vapor Density 3.17 Specific Gravity 1.261

Miscible with water Solubility Partition coefficient; n-octanol/water No data available **Autoignition Temperature** 400 °C / 752 °F **Decomposition Temperature** > 290°C

1069 mPa.s at 20 °C Viscosity

Molecular Formula C3 H8 O3 Molecular Weight 92.09

10. Stability and reactivity

Reactive Hazard None known, based on information available

Page 3/6



Glycerol Revision Date 23-Jan-2018

Stability Hygroscopic.

Conditions to Avoid Incompatible products. Excess heat.

Incompatible Materials Strong oxidizing agents

Hazardous Decomposition Products Thermal decomposition can lead to release of irritating gases and vapors

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation			
Glycerin	12600 mg/kg (Rat)	> 10 g/kg(Rabbit)	> 2.75 mg/L/4h (Rat)(mist)			

Toxicologically Synergistic

Products

Delayed and immediate effects as well as chronic effects from short and long-term exposure

No information available

IrritationNo information availableSensitizationNo information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Componer	nt	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico	
Glycerin		56-81-5	Not listed					
Mutagenic Eff	ects	No information available						

Reproductive Effects

No information available.

Developmental Effects

No information available.

Teratogenicity No information available.

STOT - single exposure None known STOT - repeated exposure None known

Aspiration hazard No information available

 $\textbf{Symptoms} \ \textit{I} \ \textbf{effects,both acute and} \ \ \textbf{No information available}$

delayed

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Glycerin	Not listed	LC50: 51 - 57 mL/L, 96h	Not listed	EC50: > 500 mg/L, 24h
		static (Oncorhynchus		(Daphnia magna)

Page 4/6



Glycerol Revision Date 23-Jan-2018

mykiss)

Persistence and Degradability Persistence is unlikely

Bioaccumulation/ Accumulation No information available.

Mobility . Will likely be mobile in the environment due to its water solubility.

Component	log Pow
Glycerin	-1.76

13. Disposal considerations

Chemical waste generators must determine whether a discarded chemical is classified as a Waste Disposal Methods

hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information					
DOT TDG IATA	Not regulated				
TDG	Not regulated				
IATA	Not regulated				
IMDG/IMO	Not regulated				
	15. Regulatory information				

All of the components in the product are on the following Inventory lists: X = listed

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Glycerin	Χ	Χ	(4)	200-289-5	781		Χ	Х	Х	Х	Χ

Legend:

X - Listed

- E Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
- F Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
- N Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
- P Indicates a commenced PMN substance
- R Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
- S Indicates a substance that is identified in a proposed or final Significant New Use Rule
- T Indicates a substance that is the subject of a Section 4 test rule under TSCA.
- XU Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
- Y1 Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
 Y2 Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

Not applicable TSCA 12(b) **SARA 313** Not applicable

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act) Not applicable Clean Air Act Not applicable OSHA Occupational Safety and Health Administration

Not applicable

Page 5/6



Glycerol Revision Date 23-Jan-2018

CERCLA Not applicable

California Proposition 65 This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know

Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island	
Glycerin	Х	Х	Х	2.5	Х	

U.S. Department of Transportation

Reportable Quantity (RQ): DOT Marine Pollutant Ν DOT Severe Marine Pollutant N

U.S. Department of Homeland Security

This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade Slight risk, Grade 1

16. Other information			
Prepared By	Regulatory Affairs		
5 6	Thermo Fisher Scientific		

Email: EMSDS.RA@thermofisher.com

Creation Date 07-Jan-2010 23-Jan-2018 **Revision Date Print Date** 23-Jan-2018 **Revision Summary**

This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). SDS sections

updated. 2. 7. 10.

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS

Page 6/6



SODIUM BISULFITE



SIGMA-ALDRICH

sigma-aldrich.com

SAFETY DATA SHEET

Version 5.9 Revision Date 05/17/2018 Print Date 07/01/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Sodium bisulfite

Product Number : 243973
Brand : Sigma-Aldrich

CAS-No. : 7631-90-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich

3050 Spruce Street SAINT LOUIS MO 63103

USA

Telephone : +1 800-325-5832 Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Acute toxicity, Oral (Category 4), H302 Serious eye damage (Category 1), H318 Acute aquatic toxicity (Category 3), H402

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)

H302 Harmful if swallowed.
H318 Causes serious eye damage.
H402 Harmful to aquatic life.

Precautionary statement(s)

P264 Wash skin thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P273 Avoid release to the environment.
P280 Wear eye protection/ face protection.

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.

Rinse mouth.

P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove

contact lenses, if present and easy to do. Continue rinsing. Immediately

Sigma-Aldrich - 243973 Page 1 of 8



call a POISON CENTER/doctor.

P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Synonyms : Sodium hydrogensulfite

Hazardous components

Component		Classification	Concentration	
Sodium hydrogensu	lphite			
CAS-No. EC-No. Index-No.	7631-90-5 231-548-0 016-064-00-8	Acute Tox. 4; H302	90 - 100 %	
Sodium metabisulph	nite			
CAS-No. EC-No. Index-No.	7681-57-4 231-673-0 016-063-00-2	Acute Tox. 4; Eye Dam. 1; Aquatic Acute 3; H302, H318, H402	90 - 100 %	

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Dry powder

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

Sigma-Aldrich - 243973 Page 2 of 8

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear respiratory protection. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Do not flush with water. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs. Avoid contact with skin and eyes. Avoid formation of dust and aerosols.

Provide appropriate exhaust ventilation at places where dust is formed.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Never allow product to get in contact with water during storage. Do not store near acids.

Air and moisture sensitive.

Storage class (TRGS 510): 13: Non Combustible Solids

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Sodium hydrogensulphite	7631-90-5	TWA	5 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Eye irritation Skin irritation Not classifiable as a human carcinogen		
		TWA	5 mg/m3	USA. NIOSH Recommended Exposure Limits
		PEL	5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
Sodium metabisulphite	7681-57-4	TWA	5 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Upper Respiratory Tract irritation Not classifiable as a human carcinogen		

Sigma-Aldrich - 243973 Page 3 of 8



TWA	5 mg/m3	USA. NIOSH Recommended Exposure Limits
PEL	5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 **Exposure controls**

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm Break through time: 480 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method:

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

a) Appearance Form: solid b) Odour No data available No data available c) Odour Threshold No data available d) pH

e) Melting point/freezing Melting point/range: 300 °C (572 °F)

point

Sigma-Aldrich - 243973 Page 4 of 8

LA-UR-19-22215



f)	Initial boiling point and boiling range	No data available
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	No data available
0)	Partition coefficient: n- octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

Strong oxidizing agents, Strong acids

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Sulphur oxides, Sodium oxides Other decomposition products - No data available

In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

No data available

Inhalation: No data available Dermal: No data available

No data available

Sigma-Aldrich - 243973 Page 5 of 8



Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as

probable, possible or confirmed human carcinogen by IARC.

No component of this product present at levels greater than or equal to 0.1% is identified as a NTP:

known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's

list of regulated carcinogens.

Reproductive toxicity

No data available No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, chest pain

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

Toxicity

No data available

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Harmful to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Sigma-Aldrich - 243973 Page 6 of 8

LA-UR-19-22215 Attachment D D-24 of 67



Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Sodium metabisulphite)

Reportable Quantity (RQ): 5000 lbs Poison Inhalation Hazard: No

IMDG

Not dangerous goods

IATA

Not dangerous goods

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Acute Health Hazard

Massachusetts Right To Know Components

Sodium hydrogensulphite Sodium metabisulphite	CAS-No. 7631-90-5 7681-57-4	Revision Date 2007-03-01 2007-03-01
Pennsylvania Right To Know Components		
Sodium hydrogensulphite Sodium metabisulphite	CAS-No. 7631-90-5 7681-57-4	Revision Date 2007-03-01 2007-03-01
New Jersey Right To Know Components		
Sodium hydrogensulphite Sodium metabisulphite	CAS-No. 7631-90-5 7681-57-4	Revision Date 2007-03-01 2007-03-01

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.

Aquatic Acute
Eye Dam.

H302

H318

Causes serious eye damage

Causes serious eye damage.

H402

Acute toxicity

Acute aquatic toxicity

Serious eye damage

Harmful if swallowed.

Causes serious eye damage.

Harmful to aquatic life.

HMIS Rating

Health hazard: 2
Chronic Health Hazard:
Flammability: 0
Physical Hazard 0

Sigma-Aldrich - 243973 Page 7 of 8



NFPA Rating

Health hazard: 2
Fire Hazard: 0
Reactivity Hazard: 0

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 5.9 Revision Date: 05/17/2018 Print Date: 07/01/2018

Sigma-Aldrich - 243973 Page 8 of 8



SODA ASH [Na2CO3]



MSDS NO:LA1109 VERSION:009 2017-05-15



SAFETY DATA SHEET

LA1109 Soda Ash 58% Dense

Preparation Date: 12/May/2017 Version: 1

1. IDENTIFICATION

Product identifier

Product Name Soda Ash 58% Dense

Other means of identification

Product Code(s) LA1109

Synonyms Sodium carbonate, anhydrous. Carbonic acid, disodium salt; Disodium carbonate;

Soda ash

Recommended use of the chemical and restrictions on use

Recommended Use Soda salts, Manufacture of glass, Soap Cleaners and water softeners, Pulp and

paper. Photographical agent. Water treatment. pH adjustment

Restricted Uses No information available

Initial Supplier Identifier

Univar Canada Ltd. 9800 Van Horne Way Richmond, BC V 6X 1W5 Telephone: 1-866-686-4827

Emergency telephone number

24 Hour Emergency Phone Number (CANUTEC): 1-888-226-8832 (1-888-CAN-UTEC)

2. HAZARD IDENTIFICATION

Hazardous Classification of the substance or mixture

Skin corrosion/irritation	Category 1
Serious eye damage/eye irritation	Category 1
Specific target organ toxicity (single exposure)	Category 3

Label elements

7.0

English / WHMIS2015 Page 1/9



MSDS NO:LA1109 VERSION:009 2017-05-15

LA1109 - Soda Ash 58% Dense

Preparation Date: 12/May/2017

Hazard pictograms



Signal Word: Danger

Hazard statements

Causes serious eye damage May cause respiratory irritation

Precautionary Statements

Prevention

Do not breathe dust/fume/gas/mist/vapors/spray Wash face, hands and any exposed skin thoroughly after handling Wear protective gloves/protective clothing/eye protection/face protection

Immediately call a POISON CENTER or doctor Specific treatment (see first aid instructions on label) Immediately call a POISON CENTER or doctor IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower] Wash contaminated clothing before reuse IF INHALED: Remove person to fresh air and keep comfortable for breathing Immediately call a POISON CENTER or doctor IF SWALLOWED: Rinse mouth, DO NOT induce vomiting

Storage

Store locked up

Store in a well-ventilated place. Keep container tightly closed

Disposal of all wastes must be done in accordance with municipal, provincial and federal regulations

Other Information

Direct skin contact may cause slight or mild, transient irritation. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Unknown acute toxicity No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Chemical Name	CAS No	Weight-%	Synonyms
Sodium Carbonate	497-19-8	90 - 100%	Sodium Carbonate

English / WHMIS2015 Page 2/9

LA-UR-19-22215 Attachment D D-29 of 67



MSDS NO:LA1109 VERSION:009 2017-05-15

LA1109 - Soda Ash 58% Dense

Preparation Date: 12/May/2017

4. FIRST AID

Description of first aid measures

General advice

Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.

Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur.

Eye contact

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.

Skin contact

Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get immediate medical advice/attention.

Do NOT induce vomiting. Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Get immediate medical advice/attention.

Self-protection of the first aider

Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid contact with skin, eyes or clothing. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation. Wear personal protective clothing (see section 8).

Most important symptoms and effects, both acute and delayed:

May cause gastrointestinal irritation, nausea, vomiting and diarrhea. May cause severe eye irritation. Symptoms include redness, swelling, itching and pain. Material is irritating to mucous membrane and upper respiratory tract. Exposure can cause coughing, chest pains and difficulty in breathing Effects may include pain, marked redness and swelling.

Indication of any immediate medical attention and special treatment needed:

Note to physicians

Treatment based on sound judgment of physician and individual reactions of patient.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Use extinguishing media appropriate for surrounding fire. Does not burn.

Specific hazards arising from the substance or mixture

Not flammable

Hazardous combustion products

Carbon dioxide. Decomposition temperature: >400°C / 752 °F.

Special protective equipment for fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection

English / WHMIS2015 Page 3/9



MSDS NO:LA1109 VERSION:009 2017-05-15

LA1109 - Soda Ash 58% Dense

Preparation Date: 12/May/2017

equipment.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Attention! Corrosive material. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Should not be released into the environment. Do not allow to enter into soil/subsoil. Prevent product from entering drains.

Methods and materials for containment and cleaning up

Prevent further leakage or spillage if safe to do so.

Pick up and transfer to properly labeled containers.

7. HANDLING AND STORAGE

Precautions for safe handling

Use good personal hygiene. Avoid prolonged contact with eyes or prolonged skin contact. Avoid breathing in dust. When dissolving, add to water cautiously while stirring; solutions can get hot.

Conditions for safe storage, including any incompatibilities

Store in a cool, dry, well ventilated area. Prolonged storage may cause product to cake and become damp from atmospheric moisture. Store away from acids.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

This product, as supplied, does not contain any hazardous materials with **Exposure Limits** occupational exposure limits established by the region specific regulatory bodies.

Chemical Name	Alberta OEL	British Columbia OEL	Ontario	Quebec OEL	Exposure Limit - ACGIH	Immediately Dangerous to Life or Health - IDLH
Sodium Carbonate 497-19-8	Not available	Not available	Not available	Not available	Not available	Not available

Consult local authorities for recommended exposure limits

Appropriate engineering controls

Engineering controls

Local exhaust ventilation as necessary to maintain exposures to within applicable limits.

Individual protection measures, such as personal protective equipment

Eye/face protection

English / WHMIS2015 Page 4/9



MSDS NO:LA1109 VERSION:009 2017-05-15

LA1109 - Soda Ash 58% Dense

Preparation Date: 12/May/2017

Safety glasses with side shields or chemical goggles.

Hand protection

Cotton gloves permitted for dry product, impervious gloves when handling solutions.

Skin and body protection

As a minimum, wear long-sleeve shirts, trousers, and gloves for routine product use.

Respiratory protection

For dusty or misty conditions, wear NIOSH-approved dust or mist respirator.

General hygiene considerations

Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance

Physical state Solid Color White Odor Odorless

Odor threshold No information available

PROPERTIES Remarks • Method

pH 11.3-11.4 (1% solution), 11.6 (5% solution), 11.7 (10% solution) @

20°C

Melting point / freezing point 854 °C / 1569 °F Initial boiling point/boiling range No data available none known Flash point No data available none known Evaporation rate No data available none known Flammability (solid, gas) No data available none known Flammability Limit in Air none known

Upper flammability limit: No data available No data available Lower flammability limit:

Vapor pressure No data available none known Relative vapor density No data available none known

Relative density 2.533 @ 20°C Water solubility Soluble in water Solubility in other solvents No data available

Partition coefficient No data available none known **Autoignition temperature** No data available none known **Decomposition temperature** >400°C/752°F none known Kinematic viscosity No data available none known Dynamic viscosity No data available none known

Explosive properties No information available. Oxidizing properties No information available.

105.99 Molecular weight

No information available VOC Percentage Volatility Liquid Density No information available No information available **Bulk density**

English / WHMIS2015 Page 5/9



MSDS NO:LA1109 VERSION:009 2017-05-15

Preparation Date: 12/May/2017

LA1109 - Soda Ash 58% Dense

10. STABILITY AND REACTIVITY

Reactivity/Chemical Stability

Possibility of hazardous reactions

Contact with acids will release carbon dioxide gas. Can react violently with red hot aluminum metal; fluorine gas; lithium; and 2,4,6-trinitrotoluene.

Hazardous polymerization

Will not occur.

Conditions to avoid

Hygroscopic (absorbs moisture from the air). Simultaneous exposure to soda ash and lime dusts (CaO). In the presence of moisture (i.e. perspiration) the two materials combine to form corrosive caustic soda (NaOH) which may cause burns.

Incompatible materials

Acids. Soda Ash is corrosive to aluminum, lead, and zinc and zinc brasses when in solution and to aluminum when high humidity is present.

Hazardous decomposition products

Carbon dioxide. Decomposition temperature: >400°C / 752 °F.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Material is irritating to mucous membrane and upper respiratory tract. Exposure can cause coughing, chest pains and difficulty in breathing.

Eye contact

Causes serious eye damage. Effects may include pain, marked redness and swelling.

Symptoms include redness, swelling, itching and pain.

Ingestion

May cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Information on toxicological effects

Symptoms

Excessive contact may produce "soda ulcers" on hands and perforation of the nasal septum. Sensitivity reactions may occur from prolonged and repeated exposure.

Numerical measures of toxicity

Acute toxicity

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral) 4,098.00 mg/kg

Unknown acute toxicity No information available

English / WHMIS2015 Page 6/9



MSDS NO:LA1109 VERSION:009 2017-05-15

LA1109 - Soda Ash 58% Dense

Preparation Date: 12/May/2017

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Sodium Carbonate 497-19-8	= 4090 mg/kg (Rat)	Not available	= 2300 mg/m³ (Rat)2 h

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation

Symptoms include redness, swelling, itching and pain.

Serious eye damage/eye irritation

Causes serious eye damage. Effects may include pain, marked redness and swelling.

Respiratory or skin sensitization

No information available.

Germ cell mutagenicity

No information available.

Carcinogenicity

No information available

Chemical Name	ACGIH	IARC	NTP	OSHA
Sodium Carbonate 497-19-8	Not available	Not available	Not available	Not available

Reproductive toxicity

No information available.

Specific target organ systemic toxicity - single exposure

No information available.

Specific target organ systemic toxicity - repeated exposure

No information available.

Aspiration hazard

No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Chemical Name	Ecotoxicity - Freshwater Algae Data	Ecotoxicity - Fish Species Data	Toxicity to microorganisms	Crustacea
Sodium Carbonate 497-19-8	Not available	310 - 1220 mg/L LC50 (Pimephales promelas) 96 h static 300 mg/L LC50 (Lepomis macrochirus) 96 h static	Not available	EC50: =265mg/L (48h, Daphnia magna)

Persistence and degradability No information available.

Bioaccumulation No information available.

Chemical Name	Partition coefficient
Sodium Carbonate 497-19-8	Not available

No information available. Other adverse effects

English / WHMIS2015 Page 7/9



UNIVAR CANADA LTD. ISSUE DATE: 2017-05-15 Annotation: MSDS NO:LA1109 VERSION:009 2017-05-15

LA1109 - Soda Ash 58% Dense

Preparation Date: 12/May/2017

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal of all wastes must be done in accordance with municipal, provincial and federal regulations.

Do not reuse empty containers.

14. TRANSPORT INFORMATION

TDG (Canada):

UN Number Not applicable
Shipping name Not regulated
Class Not applicable
Packing Group Not applicable
Marine pollutant Not available.

DOT (U.S.)

UN Number Not applicable
Shipping name Not regulated
Class Not applicable
Packing Group Not applicable

Reportable Quantity (RQ) No information available

Marine pollutant Not available

15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

Chemical Name	Ozone depletion potential (ODP)	Ozone-depleting substances (ODS)
Sodium Carbonate - 497-19-8	Not available	Not available

The Stockholm Convention on Persistent Organic Pollutants Not applicable

The Stockholm Convention on Constant Organic Constants 140t applicable		
Chemical Name	Annex	
Sodium Carbonate - 497-19-8	Not available	

The Rotterdam Convention Not applicable

Chemical Name	Chemicals Subject to Prior Informed Consent (PIC)
Sodium Carbonate - 497-19-8	Not available

NSF International



Certified to NSF/ANSI 60

Additional information

Only products bearing the NSF Mark on the product, product packaging, and/ordocumentation shipped with the product are Certified. Maximum use of potable water 100 mg/L.

U.S. Regulatory Rules

English / WHMIS2015 Page 8/9

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



UNIVAR CANADA LTD. ISSUE DATE:2017-05-15 Annotation:

MSDS NO:LA1109 VERSION:009 2017-05-15

LA1109 - Soda Ash 58% Dense

Preparation Date: 12/May/2017

International Inventories

TSCA Complies DSL/NDSL Complies

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Health hazards 3 Flammability 0 Instability 0 NFPA: Physical and chemical properties -HMIS Health Rating: Health hazards 3 Flammability 0 Physical hazards 0 Personal protection

Legend Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA (time-weighted average) STEL (Short Term Exposure Limit) STEL

Skin designation Ceiling Maximum limit value

Prepared By: The Environment, Health and Safety Department of Univar Canada Ltd.

Preparation Date: 29/Mar/2017 **Revision Date:** 12/May/2017

Disclaimer

NOTICE TO READER:

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End of Safety Data Sheet

English / WHMIS2015 Page 9/9



SODIUM CHLORIDE





SAFETY DATA SHEET

Creation Date 22-Jun-2009 Revision Date 11-Apr-2018 Revision Number 5

1. Identification

Sodium chloride **Product Name**

Cat No.: \$640-3; \$640-10; \$640-10LC; \$640-50; \$640-350LB; \$640-500;

S640SAM-1; S640SAM-2; S640SAM-3; XXBA160; XXBA161

CAS-No

Synonyms NaCl; Salt (Crystalline/Granular/USP/FCC/EP/BP/JP/ Certified ACS/Biological, Certified)

Laboratory chemicals. Recommended Use

Uses advised against Food, drug, pesticide or biocidal product use

Details of the supplier of the safety data sheet

<u>Company</u> Fisher Scientific One Reagent Lane Fair Lawn, NJ 07410 Tel: (201) 796-7100

Emergency Telephone Number

CHEMTREC®, Inside the USA: 800-424-9300 CHEMTREC®, Outside the USA: 001-703-527-3887

2. Hazard(s) Identification

Classification

Classification under 2012 OSHA Hazard Communication Standard (29 CFR 1910:1200)

Based on available data, the classification criteria are not met

Label Elements

None required

Hazards not otherwise classified (HNOC)

None identified

3. Composition/information on ingredients

Component	CAS-No	Weight %
Sodium chloride	7647-14-5	>95

4. First-aid measures

Page 1/6



Sodium chloride Revision Date 11-Apr-2018

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get

medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Get medical attention

immediately if symptoms occur.

Inhalation Move to fresh air. Get medical attention immediately if symptoms occur. If not breathing,

give artificial respiration.

Ingestion Do not induce vomiting. Obtain medical attention.

Most important symptoms and
effectsNo information available.Notes to PhysicianTreat symptomatically

5. Fire-fighting measures

Unsuitable Extinguishing Media No information available

Flash Point No information available Method - No information available

Autoignition Temperature

Explosion Limits

Upper No data available
Lower No data available
Sensitivity to Mechanical Impact No information available
Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical

Thermal decomposition can lead to release of irritating gases and vapors. Keep product and empty container away from heat and sources of ignition.

Hazardous Combustion Products

Hydrogen chloride gas Sodium oxides

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

HealthFlammabilityInstabilityPhysical hazards101N/A

6. Accidental release measures

Personal Precautions Ensure adequate ventilation. Use personal protective equipment. Avoid dust formation. Environmental Precautions Should not be released into the environment. See Section 12 for additional ecological

information.

Methods for Containment and Clean Sweep up or vacuum up spillage and collect in suitable container for disposal. Avoid dust Up formation.

7. Handling and storage

Handling Wear personal protective equipment. Ensure adequate ventilation. Avoid dust formation.

Storage Keep containers tightly closed in a dry, cool and well-ventilated place.

8. Exposure controls / personal protection

Exposure Guidelines This product does not contain any hazardous materials with occupational exposure

limitsestablished by the region specific regulatory bodies.

Page 2/6



Sodium chloride Revision Date 11-Apr-2018

Engineering Measures Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations

and safety showers are close to the workstation location.

Personal Protective Equipment

Eyelface Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by

OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard

EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard

EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical StateSolidAppearanceWhiteOdorOdorless

 Odor Threshold
 No information available

 pH
 5.0-8.0 @ 20°C; 5% aq.sol

 Melting Point/Range
 801 °C / 1473.8 °F

Boiling Point/Range 1461 °C / 2661.8 °F @ 760 mmHg

Flash Point No information available

Evaporation Rate Not applicable

Flammability (solid,gas)

No information available

Flammability or explosive limits

Upper No data available
Lower No data available
Vapor Pressure 1 mmHg @ 865 °C
Vapor Density Not applicable
Specific Gravity 2.165

Solubility Partity soluble in water Partition coefficient; n-octanol/water No data available

Autoignition Temperature

Decomposition Temperature No information available

Viscosity Not applicable

Molecular FormulaCI NaMolecular Weight58.44

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Hygroscopic.

Conditions to Avoid Incompatible products. Excess heat. Avoid dust formation. Exposure to moist air or water.

Incompatible Materials Strong oxidizing agents, Metals, Strong acids

Hazardous Decomposition Products Hydrogen chloride gas, Sodium oxides

Hazardous Polymerization Hazardous polymerization does not occur.

Page 3/6



Sodium chloride Revision Date 11-Apr-2018

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information See actual entry in RTECS for complete information.

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Sodium chloride	LD50 = 3 g/kg (Rat)	LD50 > 10 g/kg(Rabbit)	LC50 > 42 g/m³ (Rat) 1 h

Toxicologically Synergistic

No information available Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation No information available Sensitization No information available

The table below indicates whether each agency has listed any ingredient as a carcinogen. Carcinogenicity

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Sodium chloride	7647-14-5	Not listed				

Mutagenic Effects Not mutagenic in AMES Test

Reproductive Effects No information available. **Developmental Effects** No information available. No information available. Teratogenicity

STOT - single exposure None known STOT - repeated exposure None known

No information available **Aspiration hazard**

Symptoms I effects, both acute and No information available

Endocrine Disruptor Information

delayed

No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Do not empty into drains. .

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Sodium chloride	Not listed	Pimephals prome: LC50: 7650 mg/L/96h	Not listed	EC50: 1000 mg/L/48h

Persistence and Degradability Soluble in water Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its water solubility.

13. Disposal considerations

Chemical waste generators must determine whether a discarded chemical is classified as a Waste Disposal Methods

hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

Page 4/6



Sodium chloride Revision Date 11-Apr-2018

14. Transport information			
DOT	Not regulated		
DOT TDG IATA	Not regulated		
IATA	Not regulated		
IMDG/IMO	Not regulated		
15. Regulatory information			

International Inventories

Co	mponent	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Sodi	ım chloride	Х	X	-	231-598-3	-		Х	Х	Х	Х	Х

Legend:

- X Listed
- E Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
- F Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
- N Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
- P Indicates a commenced PMN substance
- R Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
- S Indicates a substance that is identified in a proposed or final Significant New Use Rule
- T Indicates a substance that is the subject of a Section 4 test rule under TSCA.
- XU Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
- Y1 Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
- Y2 Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable
SARA 313 Not applicable

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act)

Not applicable

Not applicable

OSHA Occupational Safety and Health Administration

Not applicable

CERCLA Not applicable

California Proposition 65 This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know

Not applicable

Regulations

U.S. Department of Transportation

Reportable Quantity (RQ): N
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security

This product does not contain any DHS chemicals.

Other International Regulations

Page 5/6



Sodium chloride Revision Date 11-Apr-2018

Mexico - Grade Severe risk, Grade 4

16. Other information

Prepared By Regulatory Affairs

Thermo Fisher Scientific

Email: EMSDS.RA@thermofisher.com

Creation Date 22-Jun-2009 11-Apr-2018 **Revision Date** 11-Apr-2018 **Print Date**

This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally **Revision Summary**

Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS



SULFUR DIOXIDE





Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name

SULFUR DIOXIDE

Synonyms

MTG MSDS 80; SULFUROUS ACID ANHYDRIDE; SULFUROUS OXIDE; SULPHUR DIOXIDE; SULFUROUS ANHYDRIDE; FERMENTICIDE LIQUID; SULFUR DIOXIDE(SO2); SULFUR OXIDE; SULFUR OXIDE(SO2)

Chemical Family

inorganic, gas

Product Description

Classification determined in accordance with Compressed Gas Association standards.

Industrial and Specialty Gas Applications.

Restrictions on Use

None known.

Details of the supplier of the safety data sheet

MATHESON TRI-GAS, INC. 150 Allen Road, Suite 302

Basking Ridge, NJ 07920

General Information: 1-800-416-2505

Emergency #: 1-800-424-9300 (CHEMTREC) Outside the US: 703-527-3887 (Call collect)

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.

Gases Under Pressure - Liquefied gas

Acute Toxicity - Inhalation - Gas - Category 3

Skin Corrosion/Irritation - Category 1B

Serious Eye Damage/Eye Irritation - Category 1

Respiratory Sensitization - Category 1A

Reproductive Toxicity - Category 2

Specific Target Organ Toxicity - Single Exposure - Category 1 (respiratory system)

Specific Target Organ Toxicity - Repeated Exposure - Category 1 (respiratory system, lungs)

Simple Asphyxiant

GHS Label Elements

Symbol(s)



Signal Word

Danger

Hazard Statement(s)

Contains gas under pressure; may explode if heated.

Toxic if inhaled.





Causes severe skin burns and eye damage.

May displace oxygen and cause rapid suffocation.

Precautionary Statement(s)

Prevention

Obtain special instructions before use.

Do not handle until all safety precautions have been read and understood.

Use only outdoors or in a well-ventilated area.

Wear protective gloves/protective clothing/eye protection/face protection.

Do not breathe dust/fume/gas/mist/vapors/spray.

Wear respiratory protection.

Wash thoroughly after handling.

Do not eat, drink or smoke when using this product.

Response

If exposed: Call a POISON CENTER or doctor/physician.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.

Wash contaminated clothing before reuse.

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Immediately call a POISON CENTER or doctor.

Specific treatment (see label).

Storage

Store in a well-ventilated place. Keep container tightly closed.

Store locked up.

Protect from sunlight. Store in a well-ventilated place.

Dispose of contents/container in accordance with local/regional/national/international regulations.

Other Hazards

Contact with liquified gas may cause frostbite.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS			
CAS	Component Name	Percent	
7446-09-5	Sulfur dioxide	100.0	

Section 4 - FIRST AID MEASURES

Inhalation

IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician.

Skin

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Wash contaminated clothing before reuse.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Ingestion

If swallowed, drink plenty of water, do NOT induce vomiting. Get immediate medical attention.

Most Important Symptoms/Effects





Acute

Frostbite, respiratory tract burns, skin burns, eye burns

Delayed

No information on significant adverse effects.

Note to Physicians

For inhalation, consider oxygen.

Section 5 - FIRE FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media

carbon dioxide, regular dry chemical, Large fires: Use regular foam or flood with fine water spray.

Unsuitable Extinguishing Media

None known.

Special Hazards Arising from the Chemical

Negligible fire hazard.

Hazardous Combustion Products

sulfur oxides

Fire Fighting Measures

Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. Keep unnecessary people away, isolate hazard area and deny entry.

Special Protective Equipment and Precautions for Firefighters

Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

Wear personal protective clothing and equipment, see Section 8.

Methods and Materials for Containment and Cleaning Up

Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas. Ventilate closed spaces before entering. Evacuation radius: 150 feet. Stop leak if possible without personal risk.

Reduce vapors with water spray. Do not get water directly on material.

Environmental Precautions

Avoid release to the environment.

Section 7 - HANDLING AND STORAGE

Precautions for Safe Handling

Do not get in eyes, on skin, or on clothing. Do not breathe gas, fumes, vapor, or spray. Wash hands thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection. Contaminated work clothing should not be allowed out of the workplace. Do not eat, drink or smoke when using this product. Keep only in original container. Avoid release to the environment.

Conditions for Safe Storage, Including any Incompatibilities

Store in a well-ventilated place. Keep container tightly closed.

Store locked up.

Protect from sunlight. Store in a well-ventilated place.

Store and handle in accordance with all current regulations and standards. Protect from physical damage. Store outside or in a detached building. Keep separated from incompatible substances.

Incompatible Materials

bases, combustible materials, halogens, metal carbide, metal oxides, metals, oxidizing materials, peroxides, reducing agents





Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Compo	nent l	Exposi	ure L	imits

Sulfur dioxide	7446-09-5
ACGIH:	0.25 ppm STEL
NIOSH:	2 ppm TWA ; 5 mg/m3 TWA
	5 ppm STEL; 13 mg/m3 STEL
	100 ppm IDLH
OSHA (US):	5 ppm TWA ; 13 mg/m3 TWA
Mexico:	2 ppm TWA VLE-PPT ; 5 mg/m3 TWA VLE-PPT
	5 ppm STEL [PPT-CT]; 10 mg/m3 STEL [PPT-CT]

ACGIH - Threshold Limit Values - Biological Exposure Indices (BEI)

There are no biological limit values for any of this product's components.

Engineering Controls

Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Individual Protection Measures, such as Personal Protective Equipment

Eye/face protection

Wear splash resistant safety goggles with a faceshield. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin Protection

Wear appropriate chemical resistant clothing. Wear chemical resistant clothing to prevent skin contact.

Respiratory Protection

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Glove Recommendations

Wear appropriate chemical resistant gloves.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	colorless gas	Physical State	gas		
Odor	irritating odor	Color	colorless		
Odor Threshold	3 - 5 ppm	pН	(Acidic in solution)		
Melting Point	-73 °C (-99 °F)	Boiling Point	-10 °C (14 °F)		
Boiling Point Range	Not available	Freezing point	Not available		
Evaporation Rate	>1 (Butyl acetate = 1	Flammability (solid, gas)	Not available		

LA-UR-19-22215





Autoignition Temperature	Not available	Flash Point	(Not flammable)
Lower Explosive Limit	Not available	Decomposition temperature	Not available
Upper Explosive Limit	Not available	Vapor Pressure	2432 mmHg @ 20 °C
Vapor Density (air=1)	2.26	Specific Gravity (water=1)	1.462 at -10 °C
Water Solubility	22.8 % (@ 0 °C)	Partition coefficient: n- octanol/water	Not available
Viscosity	Not available	Kinematic viscosity	Not available
Solubility (Other)	Not available	Density	Not available
Physical Form	liquified gas	Molecular Formula	S-O2
Molecular Weight	64.06		

Solvent Solubility

Soluble

alcohol, acetic acid, sulfuric acid, ether, chloroform, Benzene, sulfuryl chloride, nitrobenzenes, Toluene, acetone

Section 10 - STABILITY AND REACTIVITY

Reactivity

No reactivity hazard is expected.

Chemical Stability

Stable at normal temperatures and pressure.

Possibility of Hazardous Reactions

Will not polymerize.

Conditions to Avoid

Minimize contact with material. Containers may rupture or explode if exposed to heat.

Incompatible Materials

bases, combustible materials, halogens, metal carbide, metal oxides, metals, oxidizing materials, peroxides, reducing agents

Hazardous decomposition products

oxides of sulfur

Section 11 - TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Inhalation

Toxic if inhaled. Causes damage to respiratory system, burns, difficulty breathing

Skin Contact

Causes severe skin burns

Eye Contact

Causes serious eye damage

Ingestion

burns, nausea, vomiting, diarrhea, stomach pain

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application





Acute and Chronic Toxicity

Component Analysis - LD50/LC50

The components of this material have been reviewed in various sources and the following selected endpoints are published:

Sulfur dioxide (7446-09-5)

Inhalation LC50 Rat 2500 ppm 1 h

Product Toxicity Data

Acute Toxicity Estimate

No data available.

Immediate Effects

respiratory tract burns, skin burns, eye burns

Delayed Effects

No information on significant adverse effects.

Irritation/Corrosivity Data

respiratory tract burns. skin burns. eye burns.

Respiratory Sensitization

No data available.

Dermal Sensitization

No data available.

Component Carcinogenicity

Sulfur dioxide	7446-09-5
ACGIH:	A4 - Not Classifiable as a Human Carcinogen
IARC:	Monograph 54 [1992] (Group 3 (not classifiable))

Germ Cell Mutagenicity

No data available.

Tumorigenic Data

No data available

Reproductive Toxicity

No data available.

Specific Target Organ Toxicity - Single Exposure

No target organs identified.

Specific Target Organ Toxicity - Repeated Exposure

No target organs identified.

Aspiration hazard

Not applicable.

Medical Conditions Aggravated by Exposure

respiratory disorders

Section 12 - ECOLOGICAL INFORMATION

Component Analysis - Aquatic Toxicity

No LOLI ecotoxicity data are available for this product's components.

Persistence and Degradability

No data available.

Bioaccumulative Potential

No data available.

Mobility

LA-UR-19-22215 Attachment D D-50 of 67





No data available.

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Methods

Dispose of contents/container in accordance with local/regional/national/international regulations.

Component Waste Numbers

The U.S. EPA has not published waste numbers for this product's components.

Section 14 - TRANSPORT INFORMATION

US DOT Information:

Shipping Name: SULFUR DIOXIDE

Hazard Class: 2.3 UN/NA #: UN1079 Required Label(s): 2.3

IMDG Information:

Shipping Name: SULPHUR DIOXIDE

Hazard Class: 2.3 UN#: UN1079 Required Label(s): 2.3

TDG Information:

Shipping Name: SULFUR DIOXIDE

Hazard Class: 2.3 UN#: UN1079 Required Label(s): 2.3

International Bulk Chemical Code

This material does not contain any chemicals required by the IBC Code to be identified as dangerous chemicals in

bulk.

Section 15 - REGULATORY INFORMATION

U.S. Federal Regulations

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

Sulfur dioxide	7446-09-5
SARA 302:	500 lb TPQ
OSHA (safety):	1000 lb TQ (Liquid)
SARA 304:	500 lb EPCRA RQ

SARA Section 311/312 (40 CFR 370 Subparts B and C) reporting categories

Gas Under Pressure; Acute toxicity; Reproductive Toxicity; Skin Corrosion/Irritation; Respiratory/Skin Sensitization; Serious Eye Damage/Eye Irritation; Specific Target Organ Toxicity; Simple Asphyxiant

U.S. State Regulations

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA
Component	1 0710	~1	TATT	TATT	110	111





Sulfur dioxide	7446-09-5	Yes	Yes	Yes	Yes	Yes
----------------	-----------	-----	-----	-----	-----	-----

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects

Sulfur dioxide	7446-09-5
Repro/Dev. Tox	developmental toxicity , 7/29/2011

Canada Regulations

Canadian WHMIS Ingredient Disclosure List (IDL)

Components of this material have been checked against the Canadian WHMIS Ingredients Disclosure List. The List is composed of chemicals which must be identified on MSDSs if they are included in products which meet WHMIS criteria specified in the Controlled Products Regulations and are present above the threshold limits listed on the IDL

Sulfur dioxide	7446-09-5
	1 %

WHMIS Classification

AD1

Component Analysis - Inventory **Sulfur dioxide (7446-09-5)**

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2	KR - REACH CCA	CN	NZ	MX	TW	VN (Draft)
Ye s	DS L	EIN	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes

Section 16 - OTHER INFORMATION

NFPA Ratings

Health: 3 Fire: 0 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Summary of Changes SDS update: 02/10/2016

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU -Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CA/MA/MN/NJ/PA -California/Massachusetts/Minnesota/New Jersey/Pennsylvania*; CAS - Chemical Abstracts Service; CERCLA -Comprehensive Environmental Response, Compensation, and Liability Act; CFR - Code of Federal Regulations (US); CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG -Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EC - European Commission; EEC - European Economic Community; EIN -European Inventory of (Existing Commercial Chemical Substances); EINECS - European Inventory of Existing Commercial Chemical Substances; ENCS - Japan Existing and New Chemical Substance Inventory; EPA -





Environmental Protection Agency; EU - European Union; F - Fahrenheit; F - Background (for Venezuela Biological Exposure Indices); IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH -Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; ISHL - Japan Industrial Safety and Health Law; IUCLID - International Uniform Chemical Information Database; JP - Japan; Kow - Octanol/water partition coefficient; KR KECI Annex 1 - Korea Existing Chemicals Inventory (KECI) / Korea Existing Chemicals List (KECL); KR KECI Annex 2 - Korea Existing Chemicals Inventory (KECI) / Korea Existing Chemicals List (KECL), KR - Korea; LD50/LC50 - Lethal Dose/ Lethal Concentration; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of LIstsTM - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; MX - Mexico; Ne- Nonspecific; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; Nq - Non-quantitative; NSL - Non-Domestic Substance List (Canada); NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PEL- Permissible Exposure Limit; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH-Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA -Superfund Amendments and Reauthorization Act; Sc - Semi-quantitative; STEL - Short-term Exposure Limit; TCCA - Korea Toxic Chemicals Control Act; TDG - Transportation of Dangerous Goods; TLV - Threshold Limit Value; TSCA - Toxic Substances Control Act; TW - Taiwan; TWA - Time Weighted Average; UEL - Upper Explosive Limit; UN/NA - United Nations /North American; US - United States; VLE - Exposure Limit Value (Mexico); VN (Draft) - Vietnam (Draft); WHMIS - Workplace Hazardous Materials Information System (Canada). Other Information

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LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



BRIGHT DYES FLT YELLOW/GREEN LIQUID





Safety Data Sheet

Issue Date: 04-Oct-2013 Revision Date: 06-Feb-2017 Version Number: 1.1

1. Identification

Product Identifiers

Product Name: Bright Dyes® FLT Yellow/Green Liquid

Product Number: 106001

Recommended Use & Restrictions on Use

Water tracing & leak detection dye

Manufacturer/Supplier

Kingscote Chemicals, Inc. 3334 South Tech Blvd. Miamisburg, OH 45342 U.S.A.

Emergency Telephone Number

Company Telephone Number:

(937) 886-9100

Emergency Telephone (24 hr):

INFOTRAC (800) 535-5053 (North America)

+1-352-323-3500 (International)

2. Hazards Identification

<u>Classification</u>

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least

15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs:

Get medical advice/attention.

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek

medical attention immediately.

Page 1 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Liquid

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give

anything by mouth to an unconscious person. Get medical attention if large

quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation.

Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the

system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media

Water spray (fog). Carbon dioxide (CO2). Dry chemical. Regular foam.

Unsuitable Extinguishing Media

Not determined

Specific Hazards Arising from the Chemical

Product is not flammable. Burning/combustion may produce oxides of carbon and nitrogen (NOx).

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or

groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area

with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices.

Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing

should be thoroughly washed before reuse.

Page 2 of 6



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry, and well-

ventilated area. Keep from freezing.

Incompatible Materials Acids.

8. Exposure Controls / Personal Protection

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection Goggles.

Skin & Body Protection Rubber gloves. Suitable protective clothing.

Respiratory Protection No protection is ordinarily required under normal conditions of use.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practices.

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

 Physical State
 Liquid
 Odor
 None apparent

 Appearance
 Yellow/green liquid
 Odor Threshold
 Not determined

 Color
 Yellow/green

PropertyValuespH>8.0Melting/Freezing Point~32° FBoiling Point/Range~212° FFlash PointNot applicable

Evaporation Rate 1.8

Flammability (solid, gas)
Upper Flammability Limits
Lower Flammability Limits
Vapor Pressure
Liquid – not applicable
Not applicable
Not applicable

Vapor Density 0.6 **Relative Density** Not applicable Specific Gravity Not determined Solubility Highly soluble in water **Partition Coefficient** Not determined **Auto-ignition Temperature** Not determined **Decomposition Temperature** Not determined Not determined Viscosity

Page 3 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Liquid

10. Stability and Reactivity

Reactivity

Not reactive under normal conditions.

Chemical Stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials

Acids. Strong oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation Avoid breathing vapors or mists.

Ingestion Do not ingest.

Skin Contact May cause an allergic skin reaction.

Eye Contact Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure

May cause an allergic skin reaction.

Numerical Measures of Toxicity

Not determined

Symptoms Associated with Exposure

See Section 4 of this SDS for symptoms.

Carcinogenicity

NTP None

IARC None

OSHA None

Page **4** of **6**

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Liquid

12. Ecological Information

Ecotoxicity

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Not available

Persistence/Degradability

Not determined

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. Disposal Considerations

Waste Disposal Methods

Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

Note

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

OMDG Not regulated

15: Regulatory Information

International Inventories

TASCA This product is not subject to TSCA 12(b) reporting requirements.

U.S. Federal Regulations

CERCLA This material, as supplied, does not contain any substances regulated as

hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Page 5 of 6



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization

Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of

Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants

pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable

16: Other Information

state right-to-know regulations.

HMIS Health Hazards 1	Flammability 0	Instability O	Special Hazards Not determined
NFPA Health Hazards 1	Flammability 0	Physical Hazards 0	Personal Protection B
Issue Date	04-Oct-2013		
Revision Date	06-Feb-2017		

<u>Disclaimer</u>

Revision Note

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Content Review

End of Safety Data Sheet

Page **6** of **6**



BRIGHT DYES FLT YELLOW/GREEN TABLETS





Safety Data Sheet

Issue Date: 09-Nov-2013 Revision Date: 06-Feb-2017 Version Number: 2.1

1. Identification

Product Identifiers

Product Name: Bright Dyes® FLT Yellow/Green Tablet

Product Number: 101101

Recommended Use & Restrictions on Use

Water tracing & leak detection dye

Manufacturer/Supplier

Kingscote Chemicals, Inc. 3334 South Tech Blvd. Miamisburg, OH 45342 U.S.A.

Emergency Telephone Number

Company Telephone Number:

(937) 886-9100

Emergency Telephone (24 hr):

INFOTRAC (800) 535-5053 (North America)

+1-352-323-3500 (International)

2. Hazards Identification

Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least

15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs:

Get medical advice/attention.

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek

medical attention immediately.

Page 1 of 6



Revision Date: 06-Feb-2017

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give

anything by mouth to an unconscious person. Get medical attention if large

quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation.

Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the

system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media

Water spray (fog). Carbon dioxide (CO2). Dry chemical.

Unsuitable Extinguishing Media

Not determined

Specific Hazards Arising from the Chemical

Remote possibility of dust explosion. Burning may produce oxides of carbon and nitrogen (NOx).

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

 $\textbf{Environmental Precautions} \qquad \text{Prevent from entering into soil, ditches, sewers, waterways and/or} \\$

groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area

with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices.

Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing $\,$

should not be allowed out of the workplace.

Page 2 of 6



w/Green Tablet Revision Date: 06-Feb-2017

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry, and well-

ventilated area. Store away from heat, sparks, open flame or any other

ignition source.

Incompatible Materials Bromine trifluoride. Lithium. Strong acids, bases, and oxidizing agents.

8. Exposure Controls / Personal Protection

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection Avoid contact with eyes.

Skin & Body Protection Rubber gloves. Suitable protective clothing.

Respiratory Protection Use NIOSH-approved dust mask if dusty conditions exist.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practices.

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

Physical StateSolidOdorNone apparentAppearanceOrange tabletOdor ThresholdNot determined

Color Orange

Property <u>Values</u> Not applicable рΗ Melting/Freezing Point Not applicable **Boiling Point/Range** Not applicable **Flash Point** Not applicable **Evaporation Rate** Not applicable Flammability (solid, gas) Not flammable **Upper Flammability Limits** Not applicable Not applicable **Lower Flammability Limits** Not applicable Vapor Pressure Vapor Density Not applicable **Relative Density** Not applicable **Specific Gravity** Not applicable

Solubility Highly soluble in water with small amounts of insoluble residue

Partition Coefficient
Auto-ignition Temperature
Decomposition Temperature
Viscosity

Not determined
Not determined
Not determined
Not determined

Page **3** of **6**



Revision Date: 06-Feb-2017

10. Stability and Reactivity

Reactivity

Not reactive under normal conditions.

Chemical Stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials

Bromine trifluoride. Lithium. Strong acids, bases, and oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation Avoid inhalation of dust.

Ingestion Do not ingest.

Skin Contact May cause an allergic skin reaction.

Eye Contact Avoid contact with eyes.

<u>Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure</u>

May cause an allergic skin reaction.

Numerical Measures of Toxicity

Not determined

Symptoms Associated with Exposure

See Section 4 of this SDS for symptoms.

Carcinogenicity

NTP None

IARC None

OSHA None

Page 4 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Tablet

12. Ecological Information

Ecotoxicity

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Not available

Persistence/Degradability

This product is biodegradable.

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. Disposal Considerations

Waste Disposal Methods

Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

Note

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

OMDG Not regulated

15: Regulatory Information

International Inventories

Not determined

U.S. Federal Regulations

CERCLA This material, as supplied, does not contain any substances regulated as

hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Page 5 of 6



Revision Date: 06-Feb-2017

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization

Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of

Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants

pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable

state right-to-know regulations.

16: Other Information

	16: Other Information							
HMIS Health Hazards 1	Flammability 0	Instability O	Special Hazards Not determined					
<u>NFPA</u> Health Hazards 1	Flammability O	Physical Hazards O	Personal Protection B					
Issue Date	09-Nov-2013							
Revision Date	06-Feb-2017							
Revision Note	Content Review							

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Page 6 of 6



Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application Outfall 051 Fact Sheet

TA-55 Facility Operations
TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF)





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Table of Contents

1.0	OUTFALL LOCATION [Section I]	5
2.0	FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]	
2.1	Process Schematic and Water Balance [II.A]	5
2.2	Water Treatment Processes [II.B]	5
2.3	Discharge Rate and Frequency [II.C]	7
3.0	PRODUCTION [Section III]	7
4.0	IMPROVEMENTS [Section IV]	7
5.0	INTAKE AND EFFLUENT CHARACTERISTICS [Section V]	7
5.1	Analytical Data [V.A, B, and C]	7
5.2	Potential Pollutants [V.D]	7
6.0	POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]	9
7.0	BIOLOGICAL TOXICITY TESTING DATA [Section VII]	9
8.0	CONTRACT ANALYSIS INFORMATION [Section VIII]	. 10
	HMENT A: Location Maps for the Radioactive Liquid Waste Treatment Facility Buildings, Collection System and	
	l 051	
	HMENT B: Process Schematics and Water Balances	
ATTAC	HMENT C: Photographs	C-1
ΔΤΤΔ	HMFNT Dr. Safety Data Sheets	D-1

List of Tables

- 1 Sources for Discharges to Outfall 051
- Wastewater Treatment Codes Assigned to Outfall 051
- 3 List of Treatment Chemicals used in the Operations that Contribute to Outfall 051
- 4 Discharge Rates and Frequencies for Outfall 051
- 5 Potential Pollutants by Source for Outfall 051
- 6 List of Independent Laboratories Used for NPDES Water Analysis



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INDUSTRIAL AND SANITARY OUTFALLS 2019 NPDES PERMIT RE-APPLICATION OUTFALL 051 FACT SHEET

1.0 OUTFALL LOCATION [Section I]

Outfall ID No.:	051	Outfall Location:	TA-50
Category:	Radioactive Liquid	Originating Structure	TA-50-1
	Waste Discharge	for the Discharge:	
Flow Type:	Intermittent (batch)	Receiving Stream:	Effluent Canyon, Tributary to Mortandad Canyon,
			Water Quality Segment 20.6.4.128 NMAC
Longitude:	106° 17′ 54″ W	Latitude:	35° 51′ 54″ N

2.0 FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES [Section II]

Outfall 051 is located at TA-50 and discharges to Effluent Canyon which is a tributary to Mortandad Canyon in Water Quality Segment 20.6.4.128 NMAC. The outfall discharges treated radioactive liquid waste effluent from that originates at TA-50-1. Attachment A provides a location map. The discharge is comprised of treated effluent from the Radioactive Liquid Waste Treatment Facility (RLWTF). Table 1 identifies the discharge source, the source location, and source composition.

	Table 1							
	Sources for Discharges to Outfall 051							
TA	TA Buildings Types Transportation Mode Discharge Source Source							
			(Piping, Truck etc.)	Description	Composition			
50	1, 66, 230, 248,	Process	Piping, Truck	Radioactive Liquid	Treated effluent from			
	250, 257, 261	Cooling		Waste Treatment	the RLWTF.			
52	181, 183	Storm Water		Facility (RLWTF)				

2.1 Process Schematic and Water Balance [II.A]

A process schematic line drawing that shows the route taken by water from intake to the discharge at Outfall 051 is provided in Attachment B. This drawing includes all operations that contribute process water to the discharge at the outfall. A water balance is also provided on the process schematic with average flows. The water balance is based upon actual data collected from operations personnel.

2.2 Water Treatment Processes [II.B]

The RLWTF receives and treats radioactive liquid waste (RLW) process, cooling, and/or storm water from various generator facilities located throughout the Los Alamos National Laboratory (LANL). All wastewater that is discharged to the facility must comply with the facility's Waste Acceptance Criteria and must have a completed and approved Waste Stream Profile Form prior to its discharge. The RLWTF consists of (a) an underground collection system (double walled piping and vaults) that conveys water to Technical Area (TA) 50 from generators at LANL; (b) structures located at TA-50 that house treatment operations and the mechanical evaporator system (MES) located at TA-50-257; and (c) Solar Evaporation Tanks (SET) located at TA-52-181 and 183. The RLWTF treatment operations are centralized at TA-50-1, which houses the treatment equipment, process tanks, analytical laboratories, and offices. Structures adjacent to TA-50-1 provide low level waste (LLW) influent and emergency storage (TA-50-250), transuranic (TRU) influent storage (TA-50-66), secondary waste storage (TA-50-248), and mechanical evaporation (TA-50-257). The treatment operations are divided into the following:

- Main LLW Treatment Process: Consists of LLW influent collection, LLW influent storage, LLW treatment, and discharge of treated effluent water to the environment. The treatment process includes the addition of chemicals to the influent in reaction tanks, filtration, ion exchange, and reverse osmosis (RO). Treated effluent may be discharged to the NPDES Outfall 051, the SET located at TA-52, or the mechanical evaporation system (MES) located at TA-50-257. The main LLW treatment process generates solids/sludge and RO concentrate that is routed to the secondary treatment process.
- TRU Treatment Process: Consists of influent collection, influent storage, TRU treatment, and sludge concentration, and sludge solidification. The treated effluent water from the TRU treatment process is not

discharged to the environment. Treated effluent water either receives additional treatment in the Secondary RO or it is sent to the bottoms storage tanks located at TA-50-248. Sludge from the TRU treatment process is concentrated, solidified with cement in a drum tumbler, and shipped to the Waste Isolation Pilot Plant as a solid TRU waste for disposal.

• Secondary Treatment Process: Consists of a rotary vacuum filter to treat sludge from the main LLW treatment process, a secondary RO to treat RO concentration from the main LLW treatment process and/or effluent from the TRU treatment process, and bottoms storage tanks located at TA-50-248 for RO concentrate. Treated water is either stored as bottoms or routed back to the main LLW reaction tanks. Sludge from the rotary vacuum filter is drummed and shipped offsite for disposal as LLW radioactive solid waste. Bottoms from the storage tanks are shipped offsite in tanker trucks for disposal as LLW radioactive solid waste.

Table 2 identifies the wastewater treatment codes associated with the RLWTF. Attachment B provides a schematic of the buildings and vaults associated with the influent collection system. The vaults are monitored by radio signal and/or process logic controller at the facility to ensure that there are no leaks into the double walled piping. Photographs are provided in Attachment C.

Table 2 Wastewater Treatment Codes Assigned to Outfall 051				
Treatment Code	nt Description Justification			
1F	Evaporation	Mechanical Evaporator (MES) and Solar Evaporation Tanks (SET)		
10	Mixing	Various Storage and Reaction Tanks		
1S	Reverse Osmosis (RO) (Hyperfiltration)	Primary RO Unit		
1U	Sedimentation (Settling)	Sludge		
2C	Chemical Precipitation	Chemical precipitation of radionuclides in reaction tanks.		
2J	Ion Exchange	Removal of Perchlorate using ion exchange.		
2K	Neutralization	Influent and Room 60 Neutralization		
5Q	Landfill	Drums of TRU Waste		
5R	Pressure Filtration	Pressure Filter		
5U	Vacuum Filtration	Rotary Vacuum filter for low level waste sludge		

The water treatment processes identified in Table 2 utilize chemicals to promote precipitation, adjust pH, clean membranes, and/or otherwise treat the radioactive liquid wastewater. Table 3 provides a list of the chemicals used at the RLWTF.

Table 3 List of Treatment Chemicals used in the Operations that Contribute to Outfall 051						
Source	Chemical Name	Reason for Use	Toxic Pollutant and/or Hazardous Substances Table 2C-3 or 2C-4			
Radioactive Liquid	EDTA	Membrane Cleaning	EDTA	2C-4		
Waste Treatment Facility	Ferric Sulfate	Promote Precipitation/Flocculation	Ferric Sulfate Sulfuric Acid	2C-4		
	Hydrochloric Acid	Membrane Cleaning	Hydrochloric acid	2C-4		
	Magnesium Hydroxide	Promote Precipitation/Flocculation	NA	NA		
	Magnesium Sulfate	Precipitation/Flocculation	NA	NA		
	SIR-110	Ion Exchange Resin	NA	NA		
Sodium Bisulfite		Membrane Cleaning	Sodium Bisulfite	2C-4		
	Sodium Hydroxide 25%	Raising pH, Promote Precipitation, Flocculation, and Membrane Cleaning	Sodium Hydroxide	2C-4		
	Sulfuric Acid	pH Adjustment	Sulfuric acid	2C-4		
	WEST W-126	lonic Co-polymer used as a Flocculent	2-propanoic acid	2C-4		
	Bright Dyes FLT	Water Line and Drain Tracing Dye	NA	NA		
	Yellow-Green Liquid					

EPA ID No. NM0890010515

Table 3 List of Treatment Chemicals used in the Operations that Contribute to Outfall 051					
Source	rce Chemical Name Reason for Use Toxic Pollutant and/or Hazardo Substances Table 2C-3 or 2C				
	Bright Dyes FLT Yellow-Green Tablet	Water Line and Drain Tracing Dye	NA	NA	

EDTA = Ethylene Diamine Tetraacetic Acid

2.3 Discharge Rate and Frequency [II.C]

The discharge rates and frequencies for Outfall 051 are provided in Table 4.

Table 4 Discharge Rates and Frequencies for Outfall 051							
Frequency Flow Rates and Volumes							
Source ^a	Days/Week	Months	Average (MGD)	Maximum (MGD)	Average Volume (GPD)	Maximum Volume (GPD)	Duration (days)
Radioactive Liquid Waste							
Treatment Facility	4	12	0.020	0.040	20,000	39,840	208

[.] Estimated based on the operating parameters of the Effluent Storage Tanks.

GPD = gallons per day; MGD = million gallons per day

3.0 PRODUCTION [Section III]

Section III is not applicable to Outfall 051.

4.0 IMPROVEMENTS [Section IV]

Future improvements to the treatment processes at the RLWTF includes the startup of a newly constructed main low-level waste treatment facility located at TA-50-230 and 261. The new facility utilizes the same treatment/process technologies as the existing facility described in Section 2.2 (e.g., neutralization, reverse osmosis) and is expected to complete startup testing in 2019 with an estimated operational start date in2023. A Notice of Change will be submitted for this change prior to the start of operations and impact to the outfall. The startup of the new facility is not expected to impact the outfall location, flowrates, and discharge frequency provided in Table 4. A red lined schematic and a process flow diagram for the new facility are provided in Attachment D.

5.0 INTAKE AND EFFLUENT CHARACTERISTICS [Section V]

5.1 Analytical Data [V.A, B, and C]

The analytical results provided for the Outfall 051 Permit Reapplication on the Form 2C were provided from the following sources:

- Samples collected on September 26, 2018 and shipped to an independent laboratory for analysis.
- Field samples collected and analyzed on August 26, 2018 for temperature, residual chlorine, and pH.
- Field samples collected and analyzed on February 5, 2019 for sulfite.
- Hardness = 17.3 mg/L (CaCO₃)

A discharge monitoring report summary is not provided for Outfall 051 because the effluent form the RLWTF was not discharged to Effluent Canyon between October 2014 and September 2018. Effluent from the RLWTF was routed to the MES.

5.2 Potential Pollutants [V.D]

The treatment chemicals associated with the RLWTF and the content of the wastewaters treated by the RLWTF constitute the pollutant load of the discharge to Outfall 051. Table 5 identifies the Table 2C-3 and 2C-4 pollutants by discharge source.



It also identifies those pollutants (if any) that were detected in the analytical results from the samples collected for the 2019 Permit Application.

Table 5					
Potential Pollutants by Source for Outfall 051					
Source Description	POTENTIA		Analytical		
	Toxic Pollutant and/o		Data Results from Operational		
	Substances Table 2		Samples Collected for Outfall 051 a		
Effluent from the Radioactive Liquid	EDTA	2C-4	pH = 6.1 – 8.9 S.U.		
Waste Treatment Facility (RLWTF)	Ferric Sulfate	2C-4	Iron = 49.3 ug/L, Sulfate = 51.0 mg/L		
- Chemicals used during	Sulfuric Acid	2C-4	pH = 6.1 – 8.9 S.U.		
treatment at the RLWTF.	Hydrochloric Acid	2C-4	pH = 6.1 – 8.9 S.U.		
	Sodium Bisulfite	2C-4	Sulfite = 0.9 mg/L		
	Sodium Hydroxide	2C-4	pH = 6.1 – 8.9 S.U.		
	2-Propanoic Acid	2C-4	pH = 6.1 – 8.9 S.U.		
Effluent from the RLWTF	1,4-Dichlorobenzene	2C-4	Not detected.		
 Chemicals identified on the 	Acetic Acid	2C-4	pH = 6.1 – 8.9 S.U.		
waste stream profile forms	Acetone ^b	2C-4	Not analyzed. ^c		
associated with the	Acrolein	2C-4	Not detected.		
wastewaters discharged to	Acrylonitrile	2C-4	Not detected.		
the RLWTF for treatment.	Ammonia	2C-4	Ammonia = 0.393 mg/L		
	Ammonium Acetate	2C-4	Ammonia = 0.393 mg/L		
	Ammonium	2C-4	Ammonia = 0.393 mg/L		
	Bicarbonate		7 mm.sma		
	Ammonium Biflouride	2C-4	Ammonia = 0.393 mg/L		
	7 mmornam Billoando	20 1	Fluoride = 0.201 mg/L		
	Ammonium Carbonate	2C-4	Ammonia = 0.393 mg/L		
	Ammonium Chloride	2C-4	Ammonia = 0.393 mg/L		
	Ammonium omonde	20-4	Residual Chlorine = 0.4 mg/L		
	Ammonium Fluoride	2C-4	Ammonia = 0.393 mg/L		
	Ammondminidide	20-4	Fluoride = 0.201 mg/L		
	Ammonium Hydroxide	2C-4	Ammonia = 0.393 mg/L		
	Ammonium	2C-4	Ammonia = 0.393 mg/L		
	Thiocyanate	20-4	Ammonia – 0.393 mg/L		
	Benzene b	2C-4	Not detected.		
	Benzoic Acid	2C-4 2C-4	pH = 6.1 – 8.9 S.U.		
	Beryllium Chloride	2C-4 2C-4	Beryllium was not detected.		
	Beryllium Chloride	20-4	Residual Chlorine = 0.4 mg/L		
	Calcium Chloride	2C-4			
	Carbon Disulfide b	2C-4 2C-3 & 2C-4	Residual Chlorine = 0.4 mg/L		
			Not analyzed. °		
	Carbon Tetrachloride b	2C-4	Not detected.		
	Chlorine	2C-4	Residual Chlorine = 0.4 mg/L		
	Chlorobenzene b	2C-4	Not detected.		
	Chloroform	2C-4	1.5 mg/L		
	Cresol ^b	2C-3 & 2C-4	Not analyzed. °		
	Cupric Chloride	2C-4	Residual Chlorine = 0.4 mg/L		
			Copper = 7.35 ug/L		
	Dichlorobenzene	2C-4	Not detected.		
	Dichloropropane	2C-4	Not detected.		
	Dichloropropene	2C-4	Not detected.		
	EDTA	2C-4	pH = 6.1 – 8.9 S.U.		
	Ethylbenzene	2C-4	Not detected.		
	Ferric Chloride	2C-4	Residual Chlorine = 0.4 mg/L		
	Ferrous Ammonium	2C-4	Iron = 49.3 ug/L, Ammonia = 0.393		
	Sulfate		mg/L, Sulfate = 51.0 mg/L		
	Formic Acid	2C-4	pH = 6.1 – 8.9 S.U.		

Table 5				
Source Description	Potential Pollutants by Source for Outfall POTENTIAL Toxic Pollutant and/or Hazardous Substances Table 2C-3 or 2C-4		Analytical Data Results from Operational Samples Collected for Outfall 051 a	
	Hydrochloric Acid	2C-4	pH = 6.1 – 8.9 S.U.	
	Hydrofluoric Acid	2C-4	pH = 6.1 – 8.9 S.U.	
	Lead Nitrate	2C-4	Nitrate = 5.3 mg/L. Lead was not detected.	
	Naphthalene	2C-4	Not detected	
	Nitric Acid	2C-4	pH = 6.1 – 8.9 S.U. Nitrate = 5.3 mg/L	
	Pentachlorophenol	2C-4	Not detected.	
	Phosphoric Acid	2C-4	pH = 6.1 – 8.9 S.U. Total Phosphorus = 0.0692 mg/L	
	Potassium Hydroxide	2C-4	pH = 6.1 – 8.9 S.U.	
	Potassium permanganate	2C-4	Not analyzed. ^c	
	Silver Nitrate	2C-4	Nitrate = 5.3 mg/L Silver was not detected.	
	Sodium	2C-4	Not analyzed. ^c	
	Sodium Fluoride	2C-4	Fluoride = 0.201 mg/L	
	Sodium Hydroxide	2C-4	pH = 6.1 – 8.9 S.U.	
	Sodium Hypochlorite	2C-4	Residual Chlorine = 0.4 mg/L	
	Sodium Nitrite	2C-4	Nitrate = 5.3 mg/L	
	Sodium Phosphate	2C-4	Total Phosphorus = 0.0692 mg/L	
	Strontium	2C-3	Not analyzed. ^c	
	Sulfuric Acid	2C-4	pH = 6.1 – 8.9 S.U.	
	Toluene ^b	2C-4	Not detected.	
	Trichloroethylene b	2C-4	Not detected.	
	Uranium	2C-3	Not analyzed. ^c	
	Uranyl Nitrate	2C-4	Nitrate = 5.3 mg/L.	
	Vanadium	2C-3	Not analyzed. °	
	Xylene ^b	2C-3	Not analyzed. °	
	Zinc Acetate	2C-4	Zinc = 3.83 ug/L	
	Zinc Chloride	2C-4	Residual Chlorine = 0.4 mg/L	
	Zinc Nitrate	2C-4	Zinc = 3.83 ug/L Nitrate = 5.3 mg/L	
	Zirconium	2C-3	Not analyzed. ^c	

- a. Results are from operational samples collected from the RLWTF Effluent Tanks. These samples are representative of the effluent after final treatment and the potential discharge to Outfall 051.
- b. The potential pollutant was determined to not be associated with a "Listed" Resource Conservation and Recovery Act (RCRA) hazardous waste at the point of generation. This waste determination was documented with the associated waste stream profile form and in the waste characterization and tracking system database.
- c. The potential pollutant was not analyzed because it is not specifically called out on the Form 2C.

EDTA = Ethylene Diamine Tetraacetic Acid

The safety data sheets associated with the chemicals used to treat water at the RLWTF are provided in Attachment E.

6.0 POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS [Section VI]

Section VI is not applicable to Outfall 051.

7.0 BIOLOGICAL TOXICITY TESTING DATA [Section VII]

Whole Effluent Toxicity (WET) 48-hr acute lethality was performed on September 24, 2018 to determine the results at a critical dilution of 100% using a dilution series of 32%, 42%, 56%, 75%, and 100%. The methods used in conducting these

tests followed the guidelines stablished by the EPA manual "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition" (EPA-821-R-02-012). The WET including the following criteria as required by the permit:

• Daphnia pulex, 3-hr composite, 1/3 months

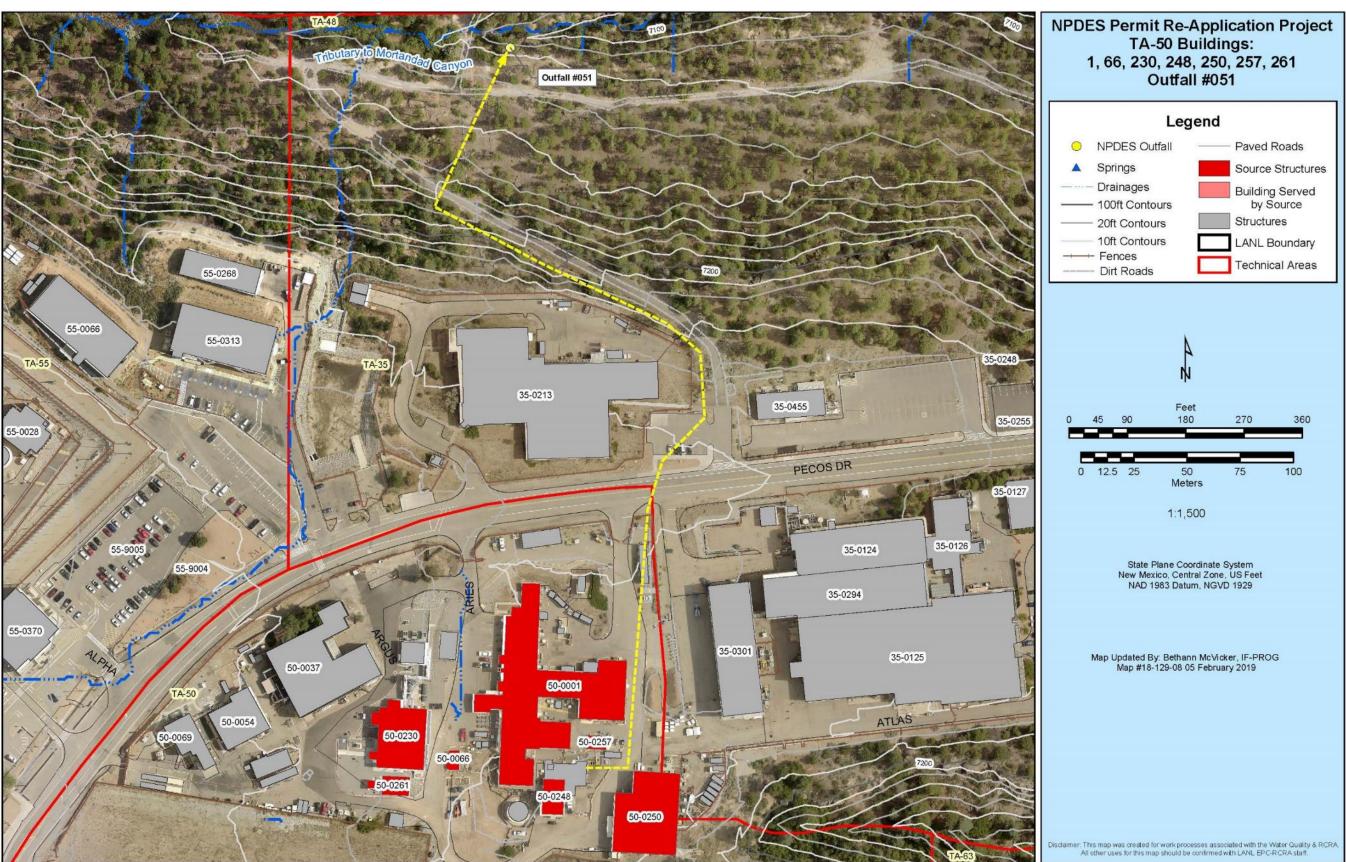
The WET test results indicated that the effluent from Outfall 051 passed the test for Daphnia pulex .

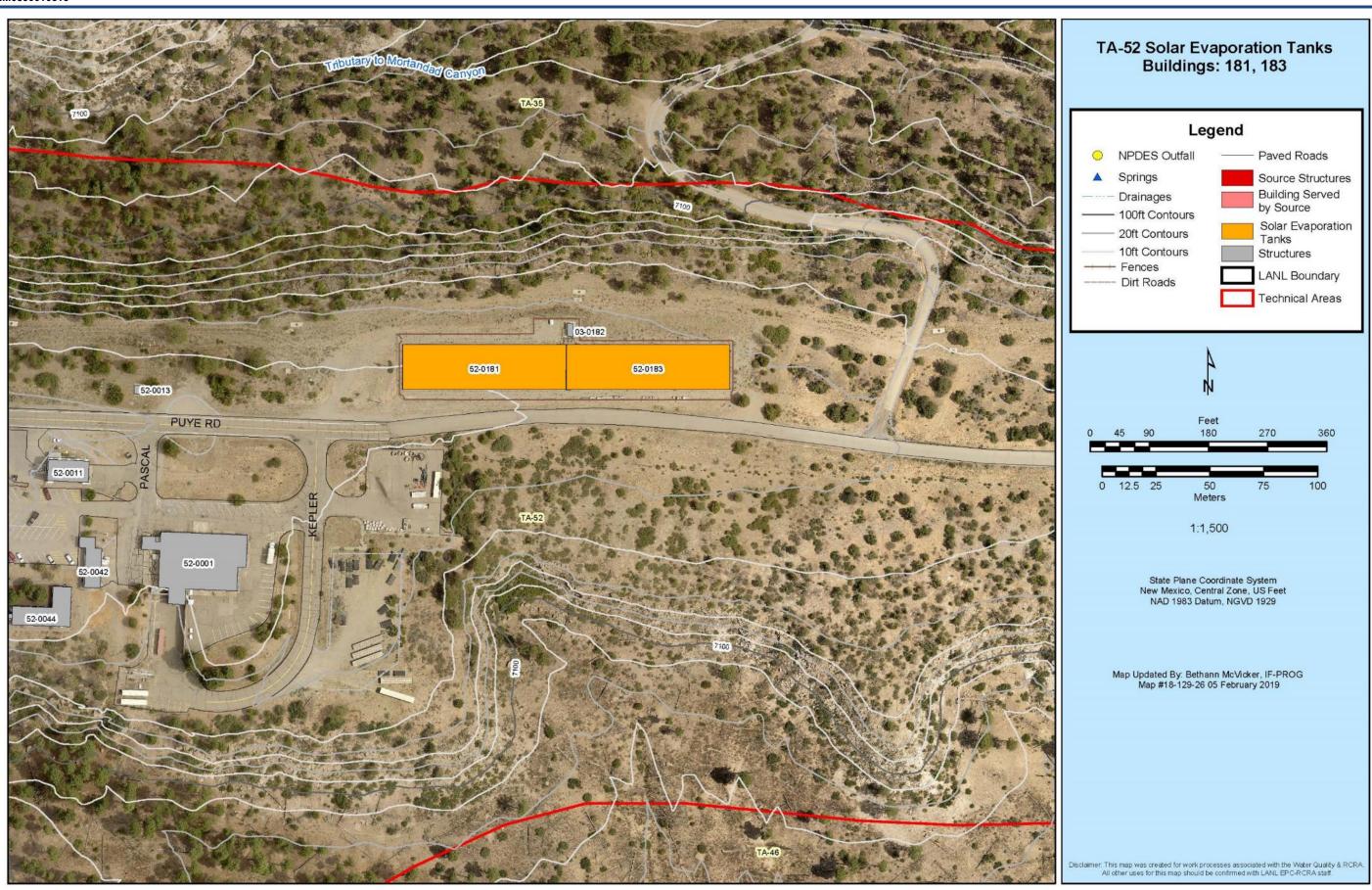
8.0 CONTRACT ANALYSIS INFORMATION [Section VIII]

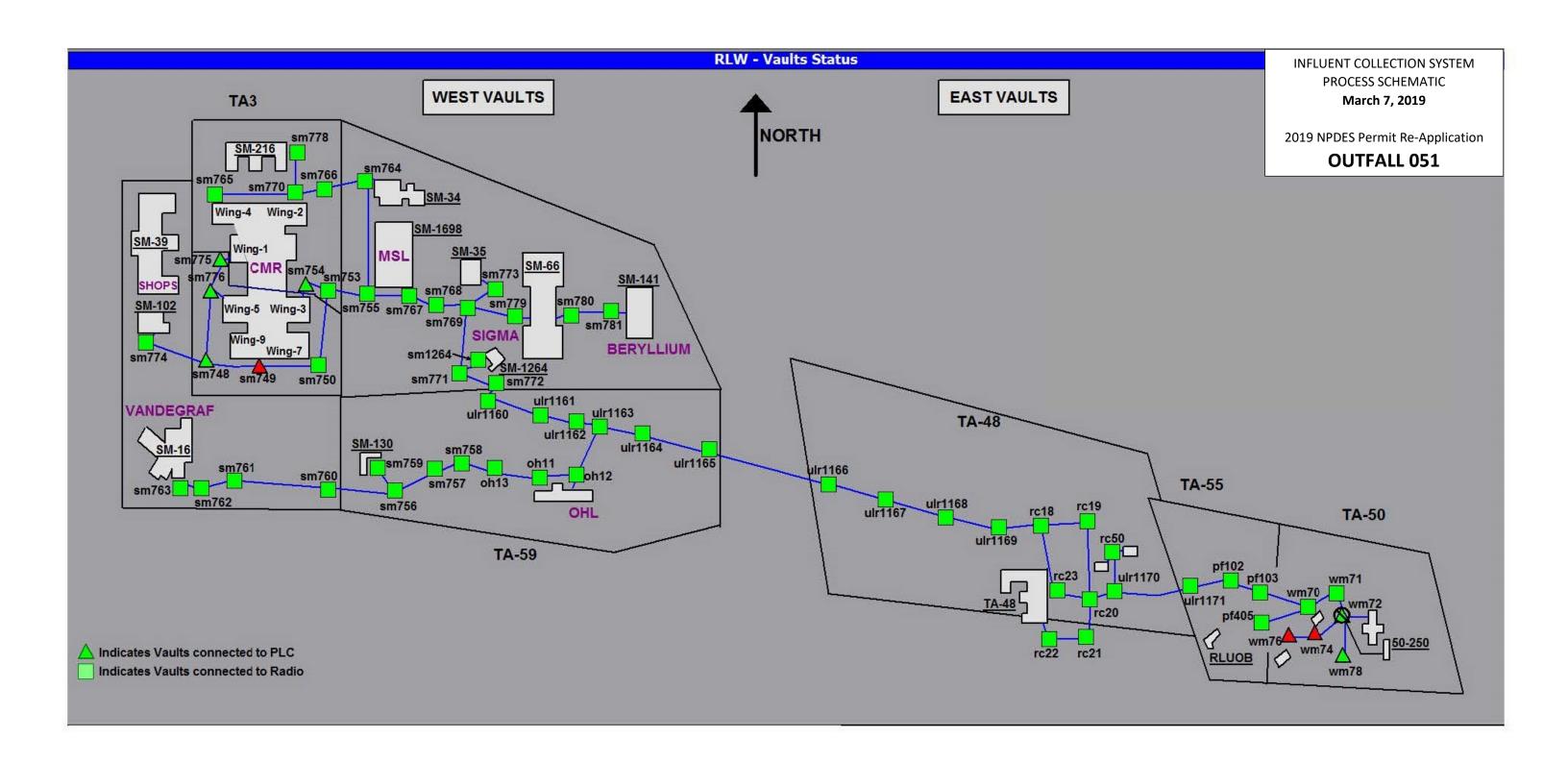
Operational samples from the RWLTF effluent were collected on September 26, 2018 for the Form 2C constituents required by the permit application forms. These samples were submitted to independent laboratories as summarized in Table 6.

Table 6 List of Independent Laboratories Used for NPDES Water Analysis					
Laboratory Name	Address and Contact Info	Analytes			
GEL Laboratories LLC	2040 Savage Road Charleston SC 29407 (843) 556-8171	Biological Oxygen Demand, General Chemistry, Pesticides, Polychlorinated Biphenyls, Radiochemistry, Semi-volatile Organic Compounds, Total Metals, Total Suspended Solids, Volatile Organic Compounds			
New Mexico Water Testing Laboratory, Inc.	401 North Coronado Ave Espanola, NM 87532 (505) 929-4545	E.coli			
Cape Fear Analytical LLC	3306 Kitty Hawk Road Suite 120 Wilmington, NC 28405 (910) 795-0421	TCDD (Dioxin)			
Pacific EcoRisk	2250 Cordelia Rd. Fairfield, CA 94534 (707) 207-7760	Whole Effluent Toxicity			

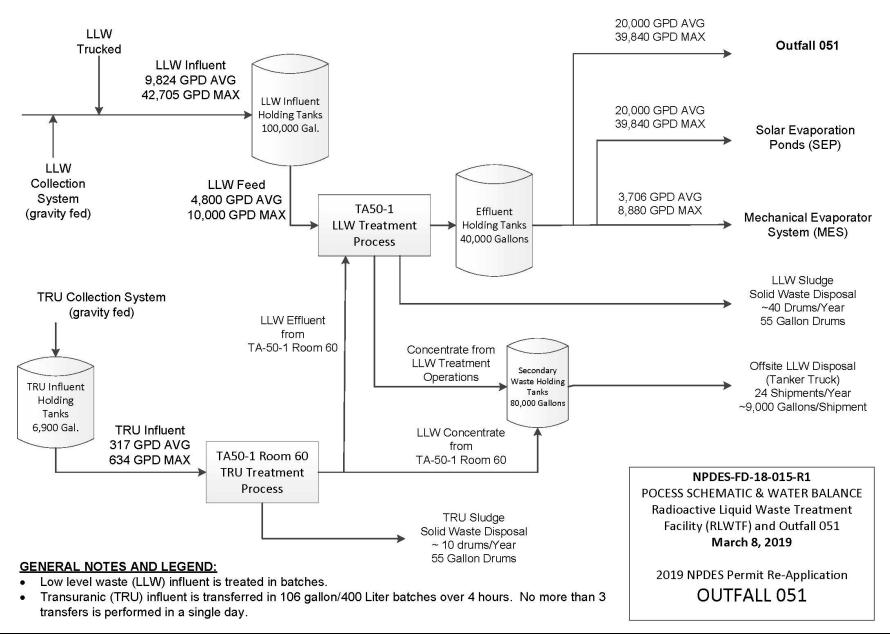
ATTACHMENT A: Location Maps for the Radioactive Liquid Waste Treatment Facility Buildings, Collection System and Outfall 051



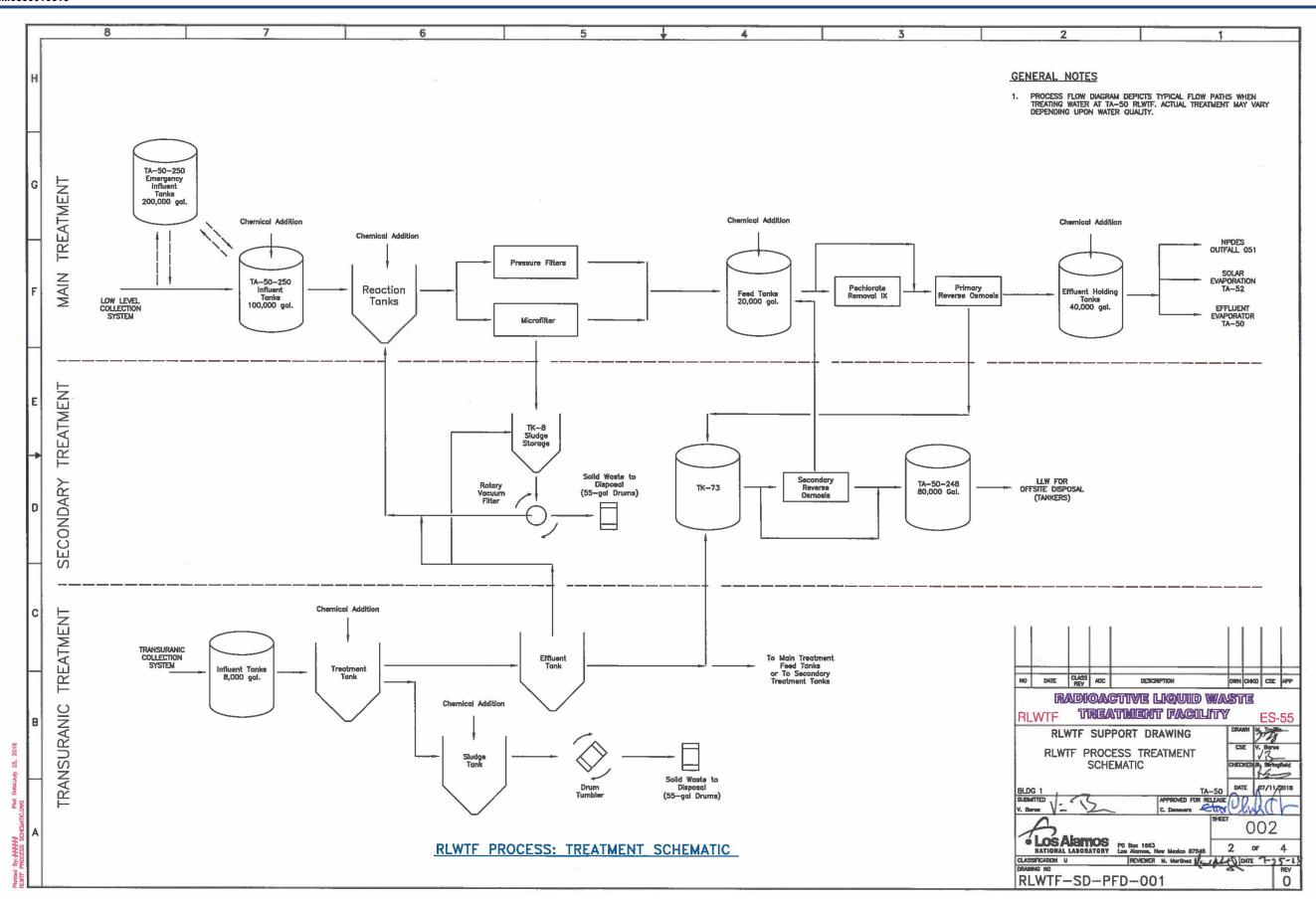




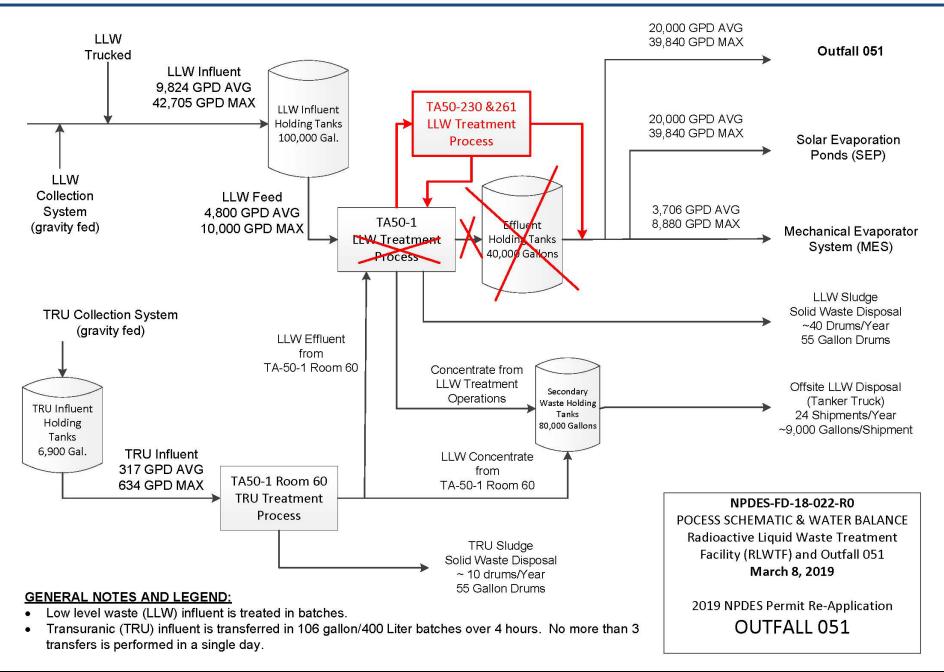
ATTACHMENT B: Process Schematics and Water Balances



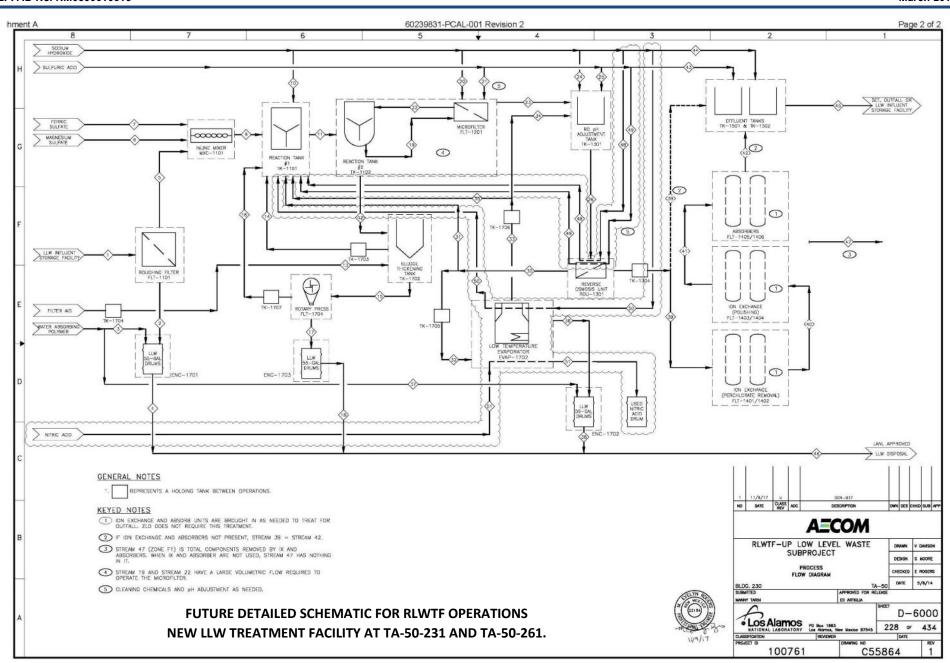








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B-4 of 4



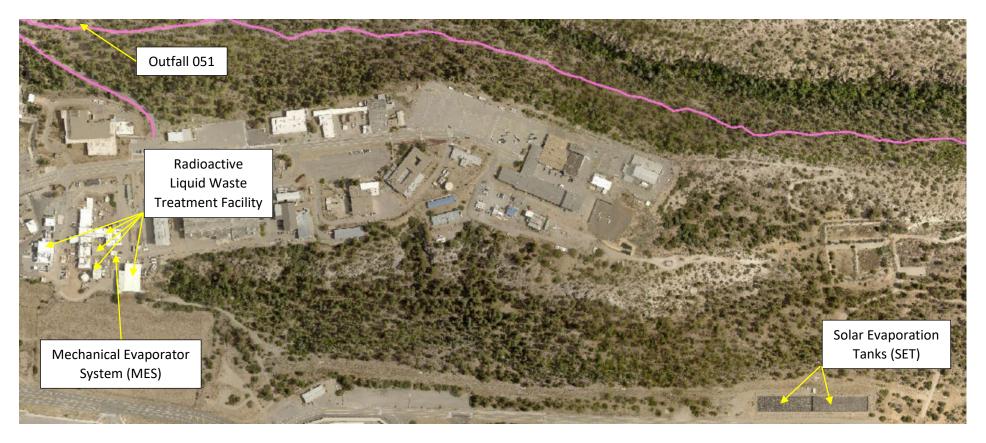
ATTACHMENT C: Photographs

Photograph ID No.	Photograph Title
NPDES-051-19-001	Location of the Radioactive Liquid Waste Treatment Facility, Mechanical Evaporator System (MES), Solar Evaporation Tanks (SET), and Outfall 051
NPDES-051-18-003	Main LLW Treatment - Influent Tanks and Emergency Storage
NPDES-051-18-004	Main LLW Treatment – Reaction Tanks
NPDES-051-18-005	Main LLW Treatment – Pressure Filters
NPDES-051-18-006	Main LLW Treatment – Microfilter
NPDES-051-18-007	Main LLW Treatment – Ion Exchange/Reverse Osmosis Feed Tank TK9
NPDES-051-18-008	Main LLW Treatment – Ion Exchange Tanks
NPDES-051-18-009	Main LLW Treatment – Primary Reverse Osmosis
NPDES-051-18-010	Main LLW Treatment – Effluent Holding Tanks
NPDES-051-18-011	Main LLW Treatment – NPDES Outfall 051
NPDES-051-18-012	Main LLW Treatment – Mechanical Evaporation System (MES) at TA-50-257
NPDES-051-18-013	Main LLW Treatment – Solar Evaporation Tanks (SET) at TA-52-181 and 183
NPDES-051-18-014	Secondary Treatment – Sludge Tank
NPDES-051-18-015	Secondary Treatment – Rotarty Vacuum Filter
NPDES-051-18-016	Secondary Treatment – Secondary Feed Tank
NPDES-051-18-017	Secondary Treatment – Secondary Reverse Osmosis
NPDES-051-18-018	Secondary Treatment – Bottoms Holding Tanks at TA-50-248
NPDES-051-18-019	TRU Treatment – Influent Tanks at TA-50-66
NPDES-051-18-020	TRU Treatment – Treatment Tanks TK1 and TK2
NPDES-051-18-021	TRU Treatment – Pressure Filter
NPDES-051-18-022	TRU Treatment – Effluent Tank TK3
NPDES-051-18-023	TRU Treatment – Sludge Treatment Tank TK7A
NPDES-051-18-024	TRU Treatment – Drum Tumbler

LA-UR-19-22215 Attachment C C-1 of 14



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Photograph - NPDES-051-19-001 Location of the Radioactive Liquid Waste Treatment Facility, Mechanical Evaporator System (MES), Solar Evaporation Tanks (SET), and Outfall 051



Photograph - NPDES-051-18-003 Main LLW Treatment - Influent Tanks and Emergency Storage



Photograph - NPDES-051-18-004 **Main LLW Treatment – Reaction Tanks**

LA-UR-19-22215 **Attachment C** C-4 of 14



Photograph - NPDES-051-18-005 **Main LLW Treatment – Pressure Filters**



Photograph - NPDES-051-18-006 Main LLW Treatment - Microfilter

LA-UR-19-22215 Attachment C C-5 of 14



Photograph - NPDES-051-18-007 Main LLW Treatment – Ion Exchange/Reverse Osmosis Feed Tank TK9



Photograph - NPDES-051-18-008 Main LLW Treatment – Ion Exchange Tanks

LA-UR-19-22215 **Attachment C** C-6 of 14



Photograph - NPDES-051-18-009 **Main LLW Treatment – Primary Reverse Osmosis**



Photograph - NPDES-051-18-0010 **Main LLW Treatment – Effluent Holding Tanks**

LA-UR-19-22215 **Attachment C** C-7 of 14



Photograph - NPDES-051-18-011 Main LLW Treatment - NPDES Outfall 051



Photograph - NPDES-051-18-012 Main LLW Treatment – Mechanical Evaporation System (MES) at TA-50-257





Photograph - NPDES-051-18-013 Main LLW Treatment – Solar Evaporation Tanks (SET) at TA-52-181 and 183



Photograph - NPDES-051-18-014 Secondary Treatment - Sludge Tank

LA-UR-19-22215 **Attachment C** C-9 of 14



Photograph - NPDES-051-18-015 **Secondary Treatment – Rotarty Vacuum Filter**



Photograph - NPDES-051-18-016 Secondary Treatment – Secondary Feed Tank





Photograph - NPDES-051-18-017 Secondary Treatment - Secondary Reverse Osmosis



Photograph - NPDES-051-18-018 Secondary Treatment – Bottoms Holding Tanks at TA-50-248

LA-UR-19-22215



Photograph - NPDES-051-18-019 TRU Treatment - Influent Tanks at TA-50-66



Photograph - NPDES-051-18-020 TRU Treatment – Treatment Tanks TK1 and TK2

LA-UR-19-22215 **Attachment C** C-12 of 14



Photograph - NPDES-051-18-021 TRU Treatment - Pressure Filter



Photograph - NPDES-051-18-022 TRU Treatment - Effluent Tank TK3



Photograph - NPDES-051-18-023 TRU Treatment – Sludge Treatment Tank TK7A



Photograph - NPDES-051-18-024 TRU Treatment – Drum Tumbler

LA-UR-19-22215 **Attachment C** C-14 of 14



ATTACHMENT D: Safety Data Sheets

LIST OF SAFETY DATA SHEETS
EDTA
Ferric Sulfate
Hydrochloric Acid
Magnesium Hydroxide
Magnesium Sulfate
SIR-110
Sodium Bisulfite
Sodium Hydroxide 25%
Sulfuric Acid
WEST W-126
Bright Dyes FLT Yellow-Green Liquid
Bright Dyes FLT Yellow-Green Tablet



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EDTA



SIGMA-ALDRICH

sigma-aldrich.com

SAFETY DATA SHEET

Version 4.13 Revision Date 06/17/2018 Print Date 07/14/2018

1. PRODUCT AND COMPANY IDENTIFICATION

Product identifiers

Product name Ethylenediaminetetraacetic acid

Product Number E9884 Brand Sigma-Aldrich Index-No. 607-429-00-8

CAS-No. 60-00-4

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

Details of the supplier of the safety data sheet 1.3

> Sigma-Aldrich Company

3050 Spruce Street SAINT LOUIS MO 63103

USA

Telephone +1 800-325-5832 Fax +1 800-325-5052

Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Eye irritation (Category 2A), H319

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Warning

Hazard statement(s)

H319 Causes serious eye irritation.

Precautionary statement(s)

P264 Wash skin thoroughly after handling.

P280 Wear protective gloves/ eye protection/ face protection.

IF IN EYES: Rinse cautiously with water for several minutes. Remove P305 + P351 + P338

contact lenses, if present and easy to do. Continue rinsing.

P337 + P313 If eye irritation persists: Get medical advice/ attention.

Hazards not otherwise classified (HNOC) or not covered by GHS - none 2.3

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 **Substances**

> Edathamil Synonyms

Sigma-Aldrich - E9884 Page 1 of 7

LA-UR-19-22215 Attachment D



(Ethylenedinitrilo)tetraacetic acid Ethylenedinitrilotetraacetic acid

EDTA

Formula C₁₀H₁₆N₂O₈ Molecular weight 292.24 g/mol 60-00-4 CAS-No. EC-No. 200-449-4 607-429-00-8 Index-No.

01-2119486399-18-XXXX Registration number

Hazardous components

Component	Classification	Concentration
Edetic acid		
	Eye Irrit. 2A; H319	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 **Description of first aid measures**

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 **Further information**

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Avoid breathing dust.

For personal protection see section 8.

Sigma-Aldrich - E9884 Page 2 of 7

LA-UR-19-22215 Attachment D



6.2 Environmental precautions

Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Keep in a dry place

Storage class (TRGS 510): 13: Non Combustible Solids

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm Break through time: 480 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact Material: Nitrile rubber

Minimum layer thickness: 0.11 mm Break through time: 480 min

Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Sigma-Aldrich - E9884 Page 3 of 7

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application
D-6 of 112

Body Protection

Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance Form: powder Colour: white

b) Odour odourless

No data available c) Odour Threshold

d) 2.5 at 10 g/l at 23 °C (73 °F)

Melting point/range: 250 °C (482 °F) - dec. Melting point/freezing

point

f) Initial boiling point and

boiling range

No data available

No data available Flash point Evaporation rate No data available i) Flammability (solid, gas) No data available Upper/lower No data available

flammability or explosive limits

No data available k) Vapour pressure Vapour density No data available

m) Relative density 1.46 g/cm3 at 20 °C (68 °F) n) Water solubility 0.4 g/l at 20 °C (68 °F)

Partition coefficient: noctanol/water

log Pow: 8.85 - 10.44 at 20 °C (68 °F)

Auto-ignition

> 400 °C (> 752 °F) at 1,013 hPa (760 mmHg)

temperature Decomposition

No data available

temperature

No data available No data available

Explosive properties Oxidizing properties No data available

9.2 Other safety information

r) Viscosity

Dissociation constant 8.85 - 10.44 at 20 °C (68 °F)

10. STABILITY AND REACTIVITY

Reactivity 10.1

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

Sigma-Aldrich - E9884 Page 4 of 7

LA-UR-19-22215 Attachment D D-7 of 112

Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

Strong oxidizing agents

Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides, Nitrogen oxides (NOx) Other decomposition products - No data available In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - male and female - 4,500 mg/kg

Inhalation: No data available Dermal: No data available

No data available

Skin corrosion/irritation

Skin - Rabbit

Result: No skin irritation

Serious eye damage/eye irritation

Eyes - Rabbit Result: Eye irritation

Respiratory or skin sensitisation

Maximisation Test - Rabbit

Result: Does not cause skin sensitisation.

Germ cell mutagenicity

No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as

probable, possible or confirmed human carcinogen by IARC.

No component of this product present at levels greater than or equal to 0.1% is identified as

probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a

carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a

known or anticipated carcinogen by NTP.

No component of this product present at levels greater than or equal to 0.1% is identified as a

known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's

list of regulated carcinogens.

No component of this product present at levels greater than or equal to 0.1% is on OSHA's

list of regulated carcinogens.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Sigma-Aldrich - E9884 Page 5 of 7

LA-UR-19-22215 Attachment D D-8 of 112



Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: AH4025000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

static test LC50 - Lepomis macrochirus (Bluegill sunfish) - 41 mg/l - 96 h Toxicity to fish

Toxicity to daphnia and

static test EC50 - Daphnia magna (Water flea) - 625 mg/l - 48 h

other aquatic invertebrates

12.2 Persistence and degradability

12.3 Bioaccumulative potential

Lepomis macrochirus - 28 d Bioaccumulation

- 80 µg/l

Bioconcentration factor (BCF): 1.8

Mobility in soil 12.4

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

May be harmful to aquatic organisms due to the shift of the pH. Avoid release to the environment.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Edetic acid)

Reportable Quantity (RQ): 5000 lbs Poison Inhalation Hazard: No

IMDG

Not dangerous goods

IATA

Not dangerous goods

15. REGULATORY INFORMATION

SARA 302 Components

Sigma-Aldrich - E9884 Page 6 of 7



No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Acute Health Hazard

Massachusetts Right To Know Components

Edetic acid	CAS-No. 60-00-4	Revision Date 2007-03-01
Pennsylvania Right To Know Components	0101	B :: B /
Edetic acid	CAS-No. 60-00-4	Revision Date 2007-03-01

New Jersey Right To Know Components

CAS-No. Revision Date 60-00-4 2007-03-01 Edetic acid

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Eye Irrit. Eye irritation

H319 Causes serious eye irritation.

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety - Americas Region 1-800-521-8956

Version: 4.13 Revision Date: 06/17/2018 Print Date: 07/14/2018

Sigma-Aldrich - E9884 Page 7 of 7



FERRIC SULFATE



SDS NO:10000813 VERSION:001 2016-03-01



Univar 3075 Highland Pkwy STE 200 Downers Grove, IL 60515 425-889-3400

SAFETY DATA SHEET

1. Identification

Product identifier: FERRIC SULFATE 50%

Other means of identification

SDS number: 000100000813

Recommended use and restriction on use

Recommended use: Not available.

Restrictions on use: Not known.

Emergency telephone number: For emergency assistance Involving chemicals

call CHEMTREC day or night at: 1-800-424-9300. CHEMTREC INTERNATIONAL Tel# 703-527-3887

2. Hazard(s) identification

Hazard classification

Health hazards

Acute toxicity (Oral) Category 4

Skin corrosion/irritation Category 1A

Serious eye damage/eye irritation Category 1

Carcinogenicity Category 1A
Environmental hazardsAcute hazards Category 3

to the aquatic environment

Label elements

Hazard symbol





SDS NO:10000813 VERSION:001 2016-03-01

Version: 1.0

Revision date: 06/01/2015



Signal word Danger

Hazard statement Corrosive.

Harmful if swallowed.

Causes severe skin burns and eye damage.

May cause cancer. Harmful to aquatic life.

Precautionary statement

Prevention Wash thoroughly after handling. Do not eat, drink or smoke when using

this product. Do not breathe dust or mists. Wear protective

gloves/protective clothing/eye protection/face protection. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required.

Response IF INHALED: Remove person to fresh air and keep comfortable for

breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. IF SWALLOWED: Call a POISON CENTER/doctor/ if you feel unwell. Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER/doctor. Specific treatment (see this label). Wash

contaminated clothing before reuse.

Storage Store in a closed container. Store locked up.

Disposal Dispose of contents/container to an appropriate treatment and disposal

facility in accordance with applicable laws and regulations, and product

characteristics at time of disposal.

SDS_US - 000100000813 2/14



SDS NO:10000813 VERSION:001 2016-03-01

Version: 1.0

Revision date: 06/01/2015



Other hazards which do not result in GHS classification

None.

3. Composition/information on ingredients

Substances

Chemical identity Common name and synonyms		CAS number	Content in percent (%)*	
Sulfuric acid, iron(3+) salt (3:2)	, Ferric Sulfate	10028-22-5	50%	
Sulfuric Acid		7664-93-9	1%	

^{*} All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

Ingestion: Do NOT induce vomiting. Never give liquid to an unconscious person. Get

medical attention immediately.

Move to fresh air. If breathing is difficult, give oxygen. Perform artificial Inhalation:

respiration if breathing has stopped.

Skin contact: Immediately flush with plenty of water for at least 15 minutes while

removing contaminated clothing and shoes.

Eye contact: If in eyes, hold eyes open, flood with water for at least 15 minutes and see

a doctor.

Most important symptoms/effects, acute and delayed

Symptoms: No data available.

Indication of immediate medical attention and special treatment needed

Treatment: No data available.

5. Fire-fighting measures

General fire hazards: No data available. Suitable (and unsuitable) extinguishing media

Suitable extinguishing Use: Foam. Carbon dioxide or dry powder.

media:

3/14 SDS_US - 000100000813

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



SDS NO:10000813 VERSION:001 2016-03-01

Version: 1.0

Revision date: 06/01/2015



Unsuitable extinguishing No data available.

media:

Specific hazards arising from the No data available.

chemical:

Special protective equipment and precautions for firefighters

Special fire fighting No data available.

procedures:

Special protective equipment for No data available.

fire-fighters:

6. Accidental release measures

Personal precautions, protective No data available.

equipment and emergency

procedures:

Methods and material for Absorb spillage with non-combustible, absorbent material. Dike for later

containment and cleaning up: disposal.

7. Handling and storage

Precautions for safe handling: Avoid contact with eyes, skin, and clothing. Avoid breathing mists or

vapors. Store away from incompatible materials. Use only with adequate

ventilation.

Conditions for safe storage,

including any incompatibilities:

No data available.

SDS_US - 000100000813

SDS NO:10000813 VERSION:001 2016-03-01

Version: 1.0

Revision date: 06/01/2015



8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Chemical identity	Туре	Exposure Limit values	Source
Sulfuric acid, iron(3+) salt (3:2) - as Fe	TWA	1 mg/m3	US. ACGIH Threshold Limit Values (03 2013)
	REL	1 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2010)
	TWA	1 mg/m3	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)
	TWA	1 mg/m3	US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A (06 2008)
Sulfuric acid, iron(3+) salt (3:2) - Particulate.	AN ESL	1 μg/m3	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (02 2013)
	ST ESL	10 μg/m3	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (02 2013)
Sulfuric acid, iron(3+) salt (3:2) - as Fe	TWA PEL	1 mg/m3	US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants (02 2012)
Sulfuric Acid - Thoracic fraction.	TWA	0.2 mg/m3	US. ACGIH Threshold Limit Values (03 2013)
Sulfuric Acid	REL	1 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2010)
	PEL	1 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	TWA	1 mg/m3	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)
	TWA	1 mg/m3	US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A (06 2008)
	TWA PEL	0.1 mg/m3	US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants (02 2012)
	STEL	3 mg/m3	US. California Code of Regulations, Title 8, Section 5155. Airborne

SDS_US - 000100000813



SDS NO:10000813 VERSION:001 2016-03-01

Version: 1.0

Revision date: 06/01/2015



Contaminants (02 2012)

Appropriate engineering

No data available.

controls

Individual protection measures, such as personal protective equipment

General information: No data available. Eye/face protection: No data available. Skin protection

Hand protection: No data available. Other: No data available. Respiratory protection: No data available. Hygiene measures: No data available.

9. Physical and chemical properties

Physical state: Liquid

Form: No data available. Color: No data available. Odor: No data available. Odor threshold: No data available.

рН: < 2

Melting point/freezing point: No data available. Initial boiling point and boiling range: No data available. Flash Point: No data available. No data available. **Evaporation rate:** Flammability (solid, gas): No data available.

Upper/lower limit on flammability or explosive limits

Flammability limit - upper (%): No data available. Flammability limit - lower (%): No data available. Explosive limit - upper (%): No data available. Explosive limit - lower (%): No data available. Vapor pressure: No data available. Vapor density: No data available. Relative density: No data available.

Solubility(ies)

Solubility in water: No data available.

6/14 SDS_US - 000100000813

LA-UR-19-22215 **Attachment D** D-17 of 112



UNIVAR USA INC. ISSUE DATE:2015-06-01

Annotation:

Version: 1.0

Revision date: 06/01/2015

SDS NO:10000813 VERSION:001 2016-03-01



Solubility (other): No data available. Partition coefficient (n-octanol/water): No data available. Auto-ignition temperature: No data available. Decomposition temperature: No data available. Viscosity: No data available.

10. Stability and reactivity

Reactivity: No data available. Chemical stability: No data available. Possibility of hazardous No data available.

reactions:

Conditions to avoid: No data available. Incompatible materials: No data available. Hazardous decomposition No data available.

products:

11. Toxicological information

Symptoms related to the physical, chemical and toxicological characteristics

Ingestion: No data available. Inhalation: No data available. Skin contact: No data available. No data available. Eye contact:

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral

Product: ATEmix (): 507.627907 mg/kg

Dermal

Product: ATEmix (): 2,000 mg/kg

Inhalation

Product: No data available.

Specified substance(s):

LC 50 (Rat,): 375 mg/m3 (, No) 2 (reliable with restrictions) Sulfuric Acid

Repeated dose toxicity

Product: No data available.

Skin corrosion/irritation

Product: No data available.

SDS_US - 000100000813 7/14

LA-UR-19-22215



SDS NO:10000813 VERSION:001 2016-03-01

Version: 1.0

Revision date: 06/01/2015



Serious eye damage/eye irritation

Product: No data available.

Respiratory or skin sensitization

Product: No data available.

Carcinogenicity

Product: No data available.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:

Sulfuric Acid Overall evaluation: 1. Carcinogenic to humans.

US. National Toxicology Program (NTP) Report on Carcinogens:

Sulfuric Acid Known To Be Human Carcinogen.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):

No carcinogenic components identified

Germ cell mutagenicity

In vitro

Product: No data available. In vivo

Product: No data available.

Reproductive toxicity

Product: No data available. Specific target organ toxicity - single exposure

Product: No data available. Specific target organ toxicity - repeated exposure

Product: No data available.

Aspiration hazard

Product: No data available. Other effects: No data available.

12. Ecological information

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish

Product: No data available.

Specified substance(s):

Sulfuric acid, iron(3+) salt LC 50 (Western mosquitofish (Gambusia affinis), 24 h): 37.2 mg/l Mortality (3:2)LC 50 (Western mosquitofish (Gambusia affinis), 48 h): 37.2 mg/l Mortality

LC 50 (Western mosquitofish (Gambusia affinis), 96 h): 37.2 mg/l Mortality

8/14 SDS_US - 000100000813



SDS NO:10000813 VERSION:001 2016-03-01

Version: 1.0

Revision date: 06/01/2015



Sulfuric Acid LC 50 (Western mosquitofish (Gambusia affinis), 96 h): 42 mg/l Mortality

Aquatic invertebrates

Product: No data available. Chronic hazards to the aquatic environment:

Fish

Product: No data available.

Aquatic invertebrates

Product: No data available.

Toxicity to Aquatic Plants

Product: No data available.

Persistence and degradability

Biodegradation

Product: No data available.

BOD/COD ratio

Product: No data available.

Bioaccumulative potential

Bioconcentration factor (BCF)

Product: No data available.
Partition coefficient n-octanol / water (log Kow)
Product: No data available.
Mobility in soil: No data available.

Known or predicted distribution to environmental compartments

Diiron tris(sulphate) No data available. Sulphuric acid No data available.

Known or predicted distribution to environmental compartments

Water No data available.

13. Disposal considerations

Disposal instructions: No data available.
Contaminated packaging: No data available.

SDS_US - 000100000813



SDS NO:10000813 VERSION:001 2016-03-01

Version: 1.0

Revision date: 06/01/2015



14. Transport information

DOT

UN number: UN 3264

UN proper shipping name: Corrosive liquid, acidic, inorganic, n.o.s.

Transport hazard class(es)

Class: 8
Label(s): 8
Packing group: III

Marine Pollutant: Not regulated.

Special precautions for user:

IMDG

UN number: UN 3264

UN proper shipping name: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.

Transport hazard class(es)

 Class:
 8

 Label(s):
 8

 EmS No.:
 F-A, S-B

 Packing group:
 III

Marine Pollutant: Not regulated.

Special precautions for user: -

IATA

UN number: UN 3264

Proper Shipping Name: Corrosive liquid, acidic, inorganic, n.o.s.

Transport hazard class(es):

 Class:
 8

 Label(s):
 8

 Packing group:
 III

Environmental hazards Not regulated.

Special precautions for user:

Other information

Passenger and cargo aircraft: Allowed.

15. Regulatory information

SDS_US - 000100000813



SDS NO:10000813 VERSION:001 2016-03-01

Version: 1.0

Revision date: 06/01/2015



US federal regulations US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):

Sulfuric acid, iron(3+) salt (3:2) Reportable quantity: 1000 lbs. Sulfuric Acid Reportable quantity: 1000 lbs.

Superfund amendments and reauthorization act of 1986 (SARA)

Hazard categories

Not listed.

SARA 302 Extremely hazardous substance

 Chemical identity
 RQ
 Threshold Planning Quantity

 Sulfuric Acid
 1000 lbs.
 1000 lbs.

SARA 304 Emergency release notification

Chemical identityRQSulfuric acid, iron(3+) salt
(3:2)1000 lbs.

Sulfuric Acid

1000 lbs.

SARA 311/312 Hazardous chemical

Chemical identityThreshold Planning QuantitySulfuric Acid500lbsSulfuric acid, iron(3+) salt500 lbs

(3:2)

SARA 313 (TRI reporting)

Reporting threshold for Chemical identity other users manufacturing and processing Sulfuric Acid 10000 lbs 25000 lbs.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)

Sulfuric acid, iron(3+) salt (3:2) Reportable quantity: 1000 lbs.

Sulfuric Acid Reportable quantity: 1000 lbs.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):

Sulfuric Acid Threshold quantity: 10000 lbs

US state regulations

US. California Proposition 65

Sulfuric Acid Carcinogenic.

SDS_US - 000100000813



SDS NO:10000813 VERSION:001 2016-03-01

Version: 1.0

Revision date: 06/01/2015



US. New Jersey Worker and Community Right-to-Know Act

Sulfuric acid, iron(3+) salt Listed

(3:2)

US. Massachusetts RTK - Substance List

Sulfuric acid, iron(3+) salt Listed

(3:2)

Sulfuric Acid Listed

US. Pennsylvania RTK - Hazardous Substances

Sulfuric acid, iron(3+) salt Listed

(3:2)

US. Rhode Island RTK

Sulfuric acid, iron(3+) salt Listed

(3:2)

SDS_US - 000100000813

SDS NO:10000813 VERSION:001 2016-03-01

Version: 1.0

Revision date: 06/01/2015



Inventory Status: Australia AICS: Not in compliance with the inventory. Not in compliance with the inventory. Canada DSL Inventory List: **EU EINECS List:** Not in compliance with the inventory. **EU ELINCS List:** Not in compliance with the inventory. Japan (ENCS) List: Not in compliance with the inventory. EU No Longer Polymers List: Not in compliance with the inventory. Not in compliance with the inventory. China Inv. Existing Chemical Substances: Not in compliance with the inventory. Korea Existing Chemicals Inv. (KECI): Canada NDSL Inventory: Not in compliance with the inventory. Philippines PICCS: Not in compliance with the inventory. US TSCA Inventory: On or in compliance with the inventory New Zealand Inventory of Chemicals: Not in compliance with the inventory. Japan ISHL Listing: Not in compliance with the inventory. Japan Pharmacopoeia Listing: Not in compliance with the inventory.

16.Other information, including date of preparation or last revision

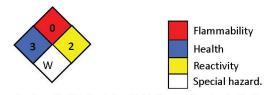
HMIS Hazard ID



K - Hood, Gloves, Protective Suit & Boots

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe; *Chronic health effect

NFPA Hazard ID



Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe

W: Water-reactive

Issue date: 06/01/2015 **Revision date:** No data available.

Version #:

Further information: No data available.

13/14 SDS US - 000100000813



HYDROCHLORIC ACID





Version: 4.4

Revision Date: 03-08-2018

SAFETY DATA SHEET

According to US Regulation 29 CFR 1910.1200 (HazCom 2012)

1. Identification

Product identifier: Hydrochloric Acid

Other means of identification

Synonyms: Muriatic Acid, Hydrogen Chloride, Aqueous

Product No.: 9385, 9538, 9165, V226, V187, V078, V001, 6900, 2624, 2515,

H999, H987, H616, 5861, 2062, 5814, 2626, 2612, 5800, 9625, 5587, 9551, 9544, 9539, 9535, 9530, 9529, 5367, H613, 37825,

25496, 20620, 9553

Recommended restrictions

Recommended use: For Laboratory, Research or Manufacturing Use.

Restrictions on use: Not determined.

Details of the supplier of the safety data sheet

Manufacturer

Company Name: Avantor Performance Materials, LLC.

Address: 3477 Corporate Parkway

Center Valley, PA 18034

Telephone: Customer Service: 855-282-6867

610-573-2610 Fax:

Contact Person: Environmental Health & Safety E-mail: info@avantormaterials.com

Emergency telephone number:

CHEMTREC: 1-800-424-9300 within US and Canada

2. Hazard(s) identification

Hazard Classification

Physical Hazards

Corrosive to metal Category 1

Health Hazards

Acute toxicity (Oral) Category 4 Category 1A Skin Corrosion/Irritation Serious Eye Damage/Eye Irritation Category 1 Category 31. Specific Target Organ Toxicity -

Single Exposure

Target Organs

Respiratory tract irritation.

Unknown toxicity - Health

Acute toxicity, oral 0 % 0 % Acute toxicity, dermal

SDS US - SDSMIX000520 1/12

LA-UR-19-22215





Version: 4.4

Revision Date: 03-08-2018

30 % Acute toxicity, inhalation, vapor Acute toxicity, inhalation, dust 30 %

or mist

Label Elements

Hazard Symbol:



Signal Word: Danger

Hazard Statement: May be corrosive to metals.

Harmful if swallowed.

Causes severe skin burns and eye damage.

May cause respiratory irritation.

Precautionary Statements

Prevention: Keep only in original packaging. Wash thoroughly after handling. Do not

breathe dust/fume/gas/mist/vapours/spray. Use only outdoors or in a well-

ventilated area. Wear protective gloves/protective clothing/eye protection/face protection. Do not eat, drink or smoke when using this

product.

Response: Absorb spillage to prevent material damage. IF SWALLOWED: Rinse

mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. Wash contaminated clothing before reuse. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.

Storage: Store locked up. Store in a well-ventilated place. Keep container tightly

closed. Store in a corrosion-resistant container with a resistant inner liner.

Disposal: Dispose of contents/container to an appropriate treatment and disposal

facility in accordance with applicable laws and regulations, and product

characteristics at time of disposal.

Hazard(s) not otherwise classified (HNOC):

None.

3. Composition/information on ingredients

Mixtures

	Chemical Identity	CAS number	Content in percent (%)*
Γ	Hydrochloric acid	7647-01-0	20 - 40%

^{*} All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

SDS US - SDSMIX000520 2/12

LA-UR-19-22215 Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application



avantor 1/2

Version: 4.4

Revision Date: 03-08-2018

General information: Get medical advice/attention if you feel unwell. Show this safety data sheet

to the doctor in attendance.

Ingestion: Call a physician or poison control center immediately. Do not induce

vomiting without advice from poison control center. If vomiting occurs, keep

head low so that stomach content doesn't get into the lungs.

Inhalation: Move to fresh air. Call a physician or poison control center immediately.

Apply artificial respiration if victim is not breathing If breathing is difficult,

give oxygen.

Skin Contact: Immediately flush with plenty of water for at least 15 minutes while

removing contaminated clothing and shoes. Call a physician or poison control center immediately. Wash contaminated clothing before reuse.

Destroy or thoroughly clean contaminated shoes.

Eye contact: Immediately flush with plenty of water for at least 15 minutes. If easy to do,

remove contact lenses. Call a physician or poison control center

immediately. In case of irritation from airborne exposure, move to fresh air.

Get medical attention immediately.

Most important symptoms/effects, acute and delayed

Symptoms: Causes severe skin and eye burns. Harmful if swallowed

Hazards: None known.

Indication of immediate medical attention and special treatment needed

Treatment: Treat symptomatically. Symptoms may be delayed

5. Fire-fighting measures

General Fire Hazards: No unusual fire or explosion hazards noted.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing

media:

The product is non-combustible. Use fire-extinguishing media appropriate

for surrounding materials.

Unsuitable extinguishing

media:

None known.

Specific hazards arising from

the chemical:

Fire or excessive heat may produce hazardous decomposition products.

Special protective equipment and precautions for firefighters

Special fire fighting

procedures:

Move containers from fire area if you can do so without risk. Use water

spray to keep fire-exposed containers cool.

Special protective equipment

for fire-fighters:

Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in

enclosed spaces, SCBA.

6. Accidental release measures

3/12 SDS US - SDSMIX000520

LA-UR-19-22215 **Attachment D** D-28 of 112





Version: 4.4

Revision Date: 03-08-2018

Personal precautions, protective equipment and emergency procedures: Ventilate closed spaces before entering them. Keep unauthorized personnel away. Evacuate area. Keep upwind. See Section 8 of the SDS for Personal Protective Equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

Methods and material for containment and cleaning up: Neutralize with lime or soda ash. Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Dike far ahead of larger spill for later recovery and disposal.

Notification Procedures:

Inform authorities if large amounts are involved.

Environmental Precautions:

Do not contaminate water sources or sewer. Prevent further leakage or

spillage if safe to do so.

7. Handling and storage

Precautions for safe handling: Do not eat, drink or smoke when using the product. Do not get in eyes, on

skin, on clothing. Wash hands thoroughly after handling. Do not breathe dust/fume/gas/mist/vapours/spray. Use caution when adding this material to water.

Conditions for safe storage, including any incompatibilities:

Keep container tightly closed. Store in a well-ventilated place. Unsuitable

containers: metals.

8. Exposure controls/personal protection

Control Parameters

Occupational Exposure Limits

Chemical Identity	Туре	Exposure Limit Values		Source
Hydrochloric acid	Ceiling	2 ppm		US. ACGIH Threshold Limit Values (2011)
	Ceil_Time	5 ppm	7 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2010)
	Ceiling	5 ppm	7 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	Ceiling	5 ppm	7 mg/m3	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)
	Ceiling	5 ppm	7 mg/m3	US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A (06 2008)
	AN ESL		5.4 ppb	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (03 2014)
	ST ESL		130 ppb	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)
	ST ESL		190 μg/m3	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)
	AN ESL		7.9 µg/m3	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (03 2014)
	TWA PEL	0.3 ppm	0.45 mg/m3	US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants (01 2015)
	Ceiling	2 ppm		US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants (01 2015)

Appropriate Engineering Controls No data available.

SDS_US - SDSMIX000520



Version: 4.4

Revision Date: 03-08-2018

Individual protection measures, such as personal protective equipment

General information: Good general ventilation (typically 10 air changes per hour) should be used.

Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an

acceptable level.

Eye/face protection: Wear safety glasses with side shields (or goggles) and a face shield.

Skin Protection

Hand Protection: Chemical resistant gloves

Other: Wear suitable protective clothing and gloves.

Respiratory Protection: If engineering controls do not maintain airborne concentrations below

> recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. Air-purifying respirator with an appropriate, government approved (where applicable), air-purifying filter,

cartridge or canister. Contact health and safety professional or

manufacturer for specific information.

Hygiene measures: Provide eyewash station and safety shower. Observe good industrial

hygiene practices. Wash hands before breaks and immediately after handling the product. Do not get in eyes. Wash contaminated clothing

before reuse. Do not get this material in contact with skin.

9. Physical and chemical properties

Appearance

Physical state: Liquid Form: Liquid Color: Colorless Odor: Pungent

Odor threshold: No data available.

0.1 (1 N aqueous solution)

Melting point/freezing point: -35 °C Initial boiling point and boiling range: 48 °C

Flash Point: not applicable Evaporation rate: No data available. Flammability (solid, gas): No data available

Upper/lower limit on flammability or explosive limits

Flammability limit - upper (%): No data available. Flammability limit - lower (%): No data available Explosive limit - upper (%): No data available. Explosive limit - lower (%): No data available.

Vapor pressure: 14.1 kPa

Vapor density: No data available. Density: 1.18 g/ml (20 °C) Relative density: 1.18 (20 °C)

Solubility(ies)

Solubility in water: Soluble

Solubility (other): No data available.

5/12 SDS_US - SDSMIX000520



avantor 2

Version: 4.4

Revision Date: 03-08-2018

Partition coefficient (n-octanol/water):No data available.Auto-ignition temperature:No data available.Decomposition temperature:No data available.Viscosity:No data available.

10. Stability and reactivity

Reactivity: Reacts violently with strong alkaline substances.

Chemical Stability: Material is stable under normal conditions.

Possibility of hazardous

reactions:

Hazardous polymerization does not occur.

Conditions to avoid: Avoid contact with strong reducing agents. Strong oxidizing agents. Contact

vith alkalis

Incompatible Materials: Amines. Alkalies. Metals. Reducing agents. Oxidizing agents.

Hazardous Decomposition Chlorine. Hydrogen chloride. By heating and fire, corrosive va

Products:

Chlorine. Hydrogen chloride. By heating and fire, corrosive vapors/gases may be formed.

11. Toxicological information

Information on likely routes of exposure

Inhalation: Causes severe burns.

Skin Contact: Causes severe skin burns.

Eye contact: Causes serious eye damage.

Ingestion: Harmful if swallowed.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral

Product: ATEmix (Rat): 2,368.42 mg/kg

Dermal

Product: ATEmix (Rabbit) 3,813.16 mg/kg

Inhalation

Product: Not classified for acute toxicity based on available data.

Repeated dose toxicity

Product: No data available.

Skin Corrosion/Irritation

Product: Causes severe skin burns.

Serious Eye Damage/Eye Irritation

Product: Causes serious eye damage.

SDS_US - SDSMIX000520 6/12

LA-UR-19-22215
Industrial and Sanitary Outfalls 2019 NRDES Pormit Po-Application



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Version: 4.4

Revision Date: 03-08-2018

Respiratory or Skin Sensitization

Product: Not a skin sensitizer.

Carcinogenicity

Product: This substance has no evidence of carcinogenic properties.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:

No carcinogenic components identified

US. National Toxicology Program (NTP) Report on Carcinogens:

No carcinogenic components identified

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):

No carcinogenic components identified

Germ Cell Mutagenicity

In vitro

Product: No mutagenic components identified

In vivo

Product: No mutagenic components identified

Reproductive toxicity

Product: No components toxic to reproduction

Specific Target Organ Toxicity - Single Exposure

Product: Respiratory tract irritation.

Specific Target Organ Toxicity - Repeated Exposure

Product: None known.

Target Organs

Specific Target Organ Toxicity - Single Exposure: Respiratory tract irritation.

Aspiration Hazard

Product: Not classified Other effects: None known.

12. Ecological information

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish

Product: No data available

Specified substance(s):

Hydrochloric acid LC 50 (Western mosquitofish (Gambusia affinis), 96 h): 282 mg/l

Aquatic Invertebrates

Product: No data available.

Specified substance(s):

Hydrochloric acid LC 50 (Green or European shore crab (Carcinus maenas), 48 h): 240 mg/l SDS_US - SDSMIX000520 7/12





Version: 4.4

Revision Date: 03-08-2018

LC 50 (Common shrimp, sand shrimp (Crangon crangon), 48 h): 260 mg/l

Chronic hazards to the aquatic environment:

Fish

Product: No data available.

Aquatic Invertebrates

No data available. Product:

Toxicity to Aquatic Plants

No data available. Product:

Persistence and Degradability

Biodegradation

Product: Expected to be readily biodegradable.

BOD/COD Ratio

Product: No data available.

Bioaccumulative potential

Bioconcentration Factor (BCF)

Product: No data available on bioaccumulation.

Partition Coefficient n-octanol / water (log Kow)

Product: No data available.

Mobility in soil: The product is water soluble and may spread in water systems.

Large amounts of the product may affect the acidity (pH-factor) in water with Other adverse effects:

possible risk of harmful effects to aquatic organisms.

13. Disposal considerations

Disposal instructions: Discharge, treatment, or disposal may be subject to national, state, or local

laws.

Contaminated Packaging: Since emptied containers retain product residue, follow label warnings even

after container is emptied.

14. Transport information

DOT

UN Number: UN 1789 UN Proper Shipping Name: Hydrochloric acid

Transport Hazard Class(es)

Class: 8 Label(s): 8 Packing Group: 11 Marine Pollutant: No

SDS US - SDSMIX000520 8/12



avantor 2

Version: 4.4

Revision Date: 03-08-2018

Special precautions for user: Not determined.

IMDG

UN Number: UN 1789

UN Proper Shipping Name: HYDROCHLORIC ACID

Transport Hazard Class(es)

 Class:
 8

 Label(s):
 8

 EmS No.:
 F-A, S-B

 Packing Group:
 II

 Marine Pollutant:
 No

Special precautions for user: Not determined.

IATA

UN Number: UN 1789
Proper Shipping Name: Hydrochloric acid

Transport Hazard Class(es):
Class:
Label(s):

Packing Group:

Marine Pollutant:

No

Special precautions for user: Not determined.

15. Regulatory information

US Federal Regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

None present or none present in regulated quantities.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):

Chemical Identity Reportable quantity

Hydrochloric acid 5000 lbs.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Corrosive to metal Acute toxicity (any route or exposure) Skin Corrosion or Irritation

Serious eye damage or eye irritation

Specific target organ toxicity (single or repeated exposure)

SARA 302 Extremely Hazardous Substance Reportable

Chemical IdentityquantityThreshold Planning QuantityHydrochloric acid5000 lbs.500 lbs.

SARA 304 Emergency Release Notification

Chemical Identity Reportable quantity

Hydrochloric acid 5000 lbs.

SDS_US - SDSMIX000520



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Version: 4.4

Revision Date: 03-08-2018

SARA 311/312 Hazardous Chemical

Chemical Identity Threshold Planning Quantity

Hydrochloric acid 500 lbs.

SARA 313 (TRI Reporting)

Reporting Reporting threshold for

threshold for manufacturing and

Chemical Identityother usersprocessingHydrochloric acid10000 lbs.25000 lbs.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):

Chemical Identity Reportable quantity

Hydrochloric acid 5000 lbs.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3):

<u>Chemical Identity</u> <u>Reportable quantity</u>

Hydrochloric acid Reportable quantity: 5000 lbs.

US State Regulations

US. California Proposition 65

No ingredient regulated by CA Prop 65 present.

US. New Jersey Worker and Community Right-to-Know Act

Chemical Identity

Hydrochloric acid

US. Massachusetts RTK - Substance List

Chemical Identity

Hydrochloric acid

US. Pennsylvania RTK - Hazardous Substances

Chemical Identity

Hydrochloric acid

US. Rhode Island RTK

Chemical Identity

Hydrochloric acid

International regulations

Montreal protocol

not applicable

Stockholm convention

not applicable

Rotterdam convention

not applicable

Kyoto protocol

not applicable

SDS_US - SDSMIX000520 10/12





Version: 4.4

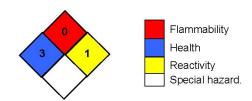
Revision Date: 03-08-2018

Inventory Status:

Australia AICS: On or in compliance with the inventory Canada DSL Inventory List: On or in compliance with the inventory EINECS, ELINCS or NLP: On or in compliance with the inventory Japan (ENCS) List: On or in compliance with the inventory China Inv. Existing Chemical Substances: On or in compliance with the inventory Korea Existing Chemicals Inv. (KECI): On or in compliance with the inventory Philippines PICCS: On or in compliance with the inventory US TSCA Inventory: On or in compliance with the inventory New Zealand Inventory of Chemicals: On or in compliance with the inventory Mexico INSQ: On or in compliance with the inventory Taiwan Chemical Substance Inventory: On or in compliance with the inventory

16.Other information, including date of preparation or last revision

NFPA Hazard ID



Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe; RNP - Rating not possible

Issue Date:03-08-2018Revision Information:Not relevant

Version #: 4.4

Source of information: Sources of information used in preparing this SDS included one or more of

the following: results from in house or supplier toxicology studies, information from the Toxicology Data Network (TOXNET), European Chemical Agency (ECHA) substance dossiers, IARC Monographs, US National Toxicology Program data, the Agency for Toxic Substances and Disease Registry, other

11/12

manufacturer's SDSs and other sources, as appropriate.

Further Information: No data available.

SDS_US - SDSMIX000520

12/12





Version: 4.4

Revision Date: 03-08-2018

Disclaimer:

The information provided in this Safety Data Sheet (SDS) was prepared based on data believed to be accurate as of the date of this SDS. TO THE GREATEST EXTENT PERMITTED BY LAW, AVANTOR PERFORMANCE MATERIALS ("AVANTOR") EXPRESSLY DISCLAIMS ANY AND ALL REPRESENTATIONS AND WARRANTIES REGARDING THE INFORMATION CONTAINED HEREIN INCLUDING, WITHOUT LIMITATION, AS TO ACCURACY, COMPLETENESS, FITNESS FOR PURPOSE OR USE, MERCHANTABILITY, NON-INFRINGEMENT, PERFORMANCE, SAFETY, SUITABILITY AND STABILITY. This SDS is intended as a guide to the appropriate use, handling, storage and disposal of the product to which it relates by properly trained personnel, and is not intended to be comprehensive. Users of Avantor's products are advised to perform their own tests and to exercise their own judgment to determine the safety, suitability and appropriate use, handling, storage and disposal of each product and product combination for their own purposes and uses. TO THE GREATEST EXTENT PERMITTED BY LAW, AVANTOR DISCLAIMS LIABILITY FOR, AND BY USING AVANTOR'S PRODUCTS PURCHASER AGREES THAT UNDER NO CIRCUMSTANCES SHALL AVANTOR BE LIABLE FOR, SPECIAL, INDIRECT, INCIDENTAL, PUNITIVE OR CONSEQUENTIAL DAMAGES OF ANY TYPE OR KIND, INCLUDING WITHOUT LIMITATION, FOR LOSS OF PROFITS, REPUTATIONAL DAMAGE, PRODUCT RECALL OR BUSINESS INTERRUPTION.

SDS US - SDSMIX000520



MAGNESIUM HYDROXIDE



SIGMA-ALDRICH

sigma-aldrich.com

SAFETY DATA SHEET

Version 4.4 Revision Date 04/05/2017 Print Date 07/13/2017

1. PRODUCT AND COMPANY IDENTIFICATION

Product identifiers

Product name Magnesium hydroxide

632309 **Product Number** Brand Aldrich CAS-No. 1309-42-8

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

> Company Sigma-Aldrich

3050 Spruce Street SAINT LOUIS MO 63103

USA

+1 800-325-5832 Telephone +1 800-325-5052 Fax

1.4 **Emergency telephone number**

> Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Not a hazardous substance or mixture.

2.2 GHS Label elements, including precautionary statements

Not a hazardous substance or mixture.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 **Substances**

Formula H_2MgO_2 58.32 g/mol Molecular weight CAS-No. 1309-42-8 EC-No. 215-170-3

No components need to be disclosed according to the applicable regulations.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Move out of dangerous area.

Aldrich - 632309 Page 1 of 7



If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration.

In case of skin contact

Wash off with soap and plenty of water.

In case of eye contact

Flush eyes with water as a precaution.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

Extinguishing media 5.1

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

No data available

Advice for firefighters 5.3

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 **Further information**

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing vapours, mist or gas.

For personal protection see section 8.

6.2 **Environmental precautions**

No special environmental precautions required.

6.3 Methods and materials for containment and cleaning up

Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.

Provide appropriate exhaust ventilation at places where dust is formed.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Keep in a dry place.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

Aldrich - 632309 Page 2 of 7



8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

8.2 **Exposure controls**

Appropriate engineering controls

General industrial hygiene practice.

Personal protective equipment

Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

No special environmental precautions required.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance Form: powder

Colour: white

b) Odour No data available c) Odour Threshold No data available

9.5 - 10.5 d) рΗ

Melting point/range: 350 °C (662 °F) - lit. Melting point/freezing

point

Aldrich - 632309 Page 3 of 7

LA-UR-19-22215 Attachment D D-41 of 112



Initial boiling point and boiling range	No data available
Flash point	No data available
Evaporation rate	No data available
Flammability (solid, gas)	No data available
Upper/lower flammability or explosive limits	No data available
Vapour pressure	No data available
Vapour density	No data available
Relative density	2.360 g/cm3
Water solubility	insoluble
Partition coefficient: n- octanol/water	No data available
Auto-ignition temperature	not auto-flammable
Decomposition temperature	No data available
Viscosity	No data available
Explosive properties	No data available
	boiling range Flash point Evaporation rate Flammability (solid, gas) Upper/lower flammability or explosive limits Vapour pressure Vapour density Relative density Water solubility Partition coefficient: n- octanol/water Auto-ignition temperature Decomposition temperature Viscosity

No data available

Initial bailing paint and

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

t) Oxidizing properties

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

Strong oxidizing agents, Strong acids

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Magnesium oxide

No data available

Other decomposition products - No data available

In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - 8,500 mg/kg

Dermal: No data available

No data available

Skin corrosion/irritation

No data available

Aldrich - 632309 Page 4 of 7

Attachment D LA-UR-19-22215 D-42 of 112



Serious eye damage/eye irritation

Eyes - Bovine cornea Result: No eye irritation (OECD Test Guideline 405)

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

reverse mutation assay Salmonella typhimurium

Result: negative

Chromosome aberration test in vitro

lymphocyte Result: negative

In vitro mammalian cell gene mutation test

mouse lymphoma cells

Result: negative

Carcinogenicity

No data available

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as

probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a

known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a

carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

Repeated dose

Rat - Oral - NOAEL : >= 1,000 mg/kg - OECD Test Guideline 422

toxicity

RTECS: OM3570000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

LC50 - Pimephales promelas (fathead minnow) - 511.31 mg/l - 96 h Toxicity to fish

static test LC50 - Daphnia magna (Water flea) - ca. 284.76 mg/l - 48 h Toxicity to daphnia and

other aquatic invertebrates

Toxicity to algae static test EC50 - Scenedesmus capricornutum (fresh water algae) - > 100 mg/l

- 72 h

Aldrich - 632309 Page 5 of 7



(OECD Test Guideline 201)

Toxicity to bacteria EC50 - activated sludge - > 1,000 mg/l

(OECD Test Guideline 209)

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

Not dangerous goods

IMDG

Not dangerous goods

IATA

Not dangerous goods

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Acute Health Hazard

Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

Magnesium hydroxide	CAS-No. 1309-42-8	Revision Date
Magnesium hydroxide	CAS-No. 1309-42-8	Revision Date

New Jersey Right To Know Components

Revision Date CAS-No. 1309-42-8 Magnesium hydroxide

Aldrich - 632309 Page 6 of 7



California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

HMIS Rating

Health hazard: 2
Chronic Health Hazard: Flammability: 0
Physical Hazard 0

NFPA Rating

Health hazard: 2
Fire Hazard: 0
Reactivity Hazard: 0

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 4.4 Revision Date: 04/05/2017 Print Date: 07/13/2017

Aldrich - 632309 Page 7 of 7



MAGNESIUM SULFATE



SIGMA-ALDRICH

sigma-aldrich.com

SAFETY DATA SHEET

Version 4.7 Revision Date 09/14/2017 Print Date 03/24/2018

1. PRODUCT AND COMPANY IDENTIFICATION

Product identifiers

CAS-No.

Product name Magnesium sulfate

Product Number 208094 Brand Sigma-Aldrich

7487-88-9 1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

> Sigma-Aldrich Canada Co. Company

2149 Winston Park Drive OAKVILLE ON L6H 6J8

CANADA

+1 9058299500 Telephone +1 9058299292 Fax

Emergency telephone number 1.4

> Emergency Phone # +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Not a hazardous substance or mixture.

2.2 GHS Label elements, including precautionary statements

Not a hazardous substance or mixture.

Hazards not otherwise classified (HNOC) or not covered by GHS - none 2.3

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 **Substances**

Synonyms Magnesium sulphate

Formula MgSO₄ Molecular weight 120.37 g/mol 7487-88-9 CAS-No. 231-298-2

No components need to be disclosed according to the applicable regulations.

Sigma-Aldrich - 208094 Page 1 of 6



4. FIRST AID MEASURES

Description of first aid measures 4.1

General advice

Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration.

In case of skin contact

Wash off with soap and plenty of water.

In case of eye contact

Flush eyes with water as a precaution.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water.

Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 **Extinguishing media**

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 **Further information**

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing vapours, mist or gas.

For personal protection see section 8.

6.2 **Environmental precautions**

No special environmental precautions required.

6.3 Methods and materials for containment and cleaning up

Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Provide appropriate exhaust ventilation at places where dust is formed.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

hygroscopic Keep in a dry place.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

Sigma-Aldrich - 208094 Page 2 of 6

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

8.2 **Exposure controls**

Appropriate engineering controls

General industrial hygiene practice.

Personal protective equipment

Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm Break through time: 480 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact Material: Nitrile rubber

Minimum layer thickness: 0.11 mm Break through time: 480 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

No special environmental precautions required.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

a) Appearance Form: granular, powder b) Odour No data available c) Odour Threshold No data available No data available d) pH e) Melting point/freezing No data available point

Initial boiling point and

boiling range

No data available

Sigma-Aldrich - 208094 Page 3 of 6



g) Flash point No data available
h) Evaporation rate No data available
i) Flammability (solid, gas) No data available
j) Upper/lower No data available

flammability or explosive limits

k) Vapour pressure < 0.1 hPa (< 0.1 mmHg) at 20 °C (68 °F)

I) Vapour density No data availablem) Relative density 1.070 g/cm3

n) Water solubility ca.73.8 g/l at 100 °C (212 °F)

o) Partition coefficient: noctanol/water No data available

p) Auto-ignition temperature

No data available

q) Decomposition temperature

No data available

r) Viscosity No data available
 s) Explosive properties No data available
 t) Oxidizing properties No data available

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

hygroscopic

10.5 Incompatible materials

Strong oxidizing agents

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Sulphur oxides, Magnesium oxide Other decomposition products - No data available

In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - > 2,000 mg/kg

LD50 Inhalation - Rabbit - > 2,000 mg/l

Dermal: No data available

LD50 Intraperitoneal - Mouse - 1,029 mg/kg

Skin corrosion/irritation

Skin - in vitro assay Result: No skin irritation

Sigma-Aldrich - 208094 Page 4 of 6

Serious eye damage/eye irritation

Eyes - Rabbit

Result: No eye irritation (OECD Test Guideline 405)

Respiratory or skin sensitisation

in vivo assay - Mouse

Result: Did not cause sensitisation on laboratory animals.

Does not cause skin sensitisation. (OECD Test Guideline 429) Remarks: No data available

Germ cell mutagenicity

No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as

probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: OM4500000

Diarrhoea, Vomiting, Central nervous system depression, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

LC50 - Pimephales promelas (fathead minnow) - 2,820 mg/l - 96 h Toxicity to fish

EC50 - Daphnia magna (Water flea) - 343.56 mg/l - 48 h Toxicity to daphnia and

other aquatic invertebrates

Toxicity to algae EC50 - Desmodesmus subspicatus (green algae) - 2,700 mg/l - 72 h

(ISO 8692)

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

Sigma-Aldrich - 208094 Page 5 of 6

LA-UR-19-22215 **Attachment D** D-51 of 112



13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

TDG (Canada)

Not dangerous goods

IMDG

Not dangerous goods

IATA

Not dangerous goods

15. REGULATORY INFORMATION

This product has been classified in accordance with the hazard criteria of the Hazardous Products Regulations (HPR) and the SDS contains all the information required by the HPR.

16. OTHER INFORMATION

Further information

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Version: 4.7 Revision Date: 09/14/2017 Print Date: 03/24/2018

Sigma-Aldrich - 208094 Page 6 of 6



ResinTech SIR-110-HP





Safety Data Sheet

Product Name: SIR-110-HP

(Perchlorate selective Strong Base Anion Exchange Resin Chloride Form)

Effective date February 23, 2018

Section 1: Identification

1a Product Name ResinTech SIR-110-HP

1b Common Name Perchlorate and nitrate Selective strong base anion

resin in the chloride form.

1c Intended use Removal of perchlorate, iodide, and from water.

1d Manufacturer ResinTech, Inc.

Address 160 Cooper Road,

West Berlin, NJ 08091 USA

Phone 856-768-9600

Email ixresin@resintech.com

Section 2: Hazard Identification

2a OSHA Hazard classification Not hazardous or dangerous

Product Hazard Rating	Scale
Health = 0	0 = Negligible
Fire = 1	1 = Slight
Reactivity = 0	2 = Moderate
Special - N/A	3 = High
	4 = Extreme

2b Product description Light cream to light yellow colored solid beads

with little or no odor.

2c Precautions for use Safety glasses and gloves recommended.

Slipping hazard if spilled.

2c Potential health effects Will cause eye irritation.

May casue mild skin irritation.

Ingestion is not likely to pose a health risk.

2d Environmental effects Little or none.



Section 2A: Hazard classification UN OSHA globally harmonized system



Warning (contains ion exchange resin)

H320: Causes eye irritation (Category 2B)

Precautionary Statements

P264: Wash hands thoroughly after handling.

P280: Wear protective gloves/protective clothing/eye protection/face protection

P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact

lenses if present and easy to do - continue rinsing.

P333+313: If skin irritation or a rash occurs: Get medical advice/attention.

P337+313: If eye irritation persists get medical advice/attention.

P403+233: Store in a well-ventilated place. Keep container tightly closed.

P411: Store at temperatures not exceeding 50 °C/ 122 °F.

Please refer to the safety data sheet for additional information regarding this product

ResinTech, Inc. 160 Cooper Road West Berlin, NJ 08091-9234 856 768-9600 Ixresin@resintech.com



Sec	Section 3: Composition/ Information on Ingredients			
3a	Chemical name	Tributylamine functionalized chloromethylated copolymer of polystyrene in the chloride form.		
3b	Ingredients Tributylamine functionalized chloromethlyated copolymer of styrene and divinylbenzene in the chloride form	CAS# 116565-72-1 (55 - 70%)		
	Water	CAS# 7732-18-5 (30 – 45%)		

Sec	Section 4: First Aid Measures			
4a	Inhalation	No adverse effects expected- normal use of product does not produce odors or vapors.		
4b	Skin	Wash with soap and water- seek medical attention if a rash develops.		
4c	Eye contact	Wash immediately with water-seek attention if discomfort continues.		
4d	Ingestion	No adverse effects expected for small amounts, larger amounts can cause stomach irritation. Seek medical attention if discomfort occurs.		
Sec	Section 5: Fire Fighting Measures			
5a	Flammability	NFPA Fire rating = 1		
5b	Extinguishing media	Water, CO2, foam, dry powder		
5c	Fire fighting Procedures	Follow general fire fighting procedures indicated in the work place.		
5d	Protective Equipment	MSHA/NIOSH approved self-contained breathing gear, full protective clothing.		
5e	Combustion Products	Carbon oxides and other toxic gasses and vapors.		
5f	Unusual Hazards	Product is not combustible until moisture is removed. Resin begins to burn at approximately 230° C. Auto ignition can occur above 500° C.		



Sec	ction 6: Accidental Release Measures	
6a	Personal Precautions	Keep people away, spilled resin can be a slipping hazard, wear gloves and safety glasses to minimize skin or eye contact.
6b	Incompatible Chemicals	Strong oxidants can create risk of combustion products similar to burning.
6c	Environmental Precautions	Keep out of public sewers and waterways.
6d	Containment Materials	Use plastic or paper containers.
6e	Methods of Clean-up	Sweep up material and transfer to containers.
Sec	ction 7: Handling and Storage	
7a	Handling	Avoid prolonged skin contact. Keep resin moist and avoid allowing resin to completely dry.
7b	Storage	Store in a cool dry place (0° to 45° C) in the original shipping container. This product is thermally sensitive and will have reduced shelf life if subjected to extended periods of time at temperatures exceeding 50° C. Although freezing does not usually damage ion exchange resins, avoid repeated freeze thaw cycles.

Section	8:	Exposure	Controls/	Personal	Protection

8a OSHA exposure limits None noted.

8b Engineering Controls Provide adequate ventilation.

8c Personal Protection Measures

Eye Protection Safety glasses or goggles.
Respiratory Protection Not required for normal use.

Protective Gloves Recommended for extended contact.



Section 9: Physical and Chemical Properties

Appearance Light cream to light yellow beads approx.

0.6 mm diameter.

Flammability or explosive limits Flammable above 500° C

Odor Little or no odor

Physical State Solid

Vapor pressure Not available
Odor threshold Not available
Vapor density Not available
pH Near neutral

Relative density Approx 680 grams/Liter

Melting point/freezing point Does not melt, freezes at approx. 0 C
Solubility Insoluble in water and most solvents

Boiling point Does not boil
Flash point Approx 500° C

Evaporation rate Does not evaporate

Partition Coefficient (n-octonol/water)

Auto-ignition temperature

Decomposition temperature

Viscosity

Not applicable

Approx 500° C

Above 230° C

Not applicable

Section 10: Stability and Reactivity

10a Stability Stable under normal conditions.

10b Conditions to Avoid Heat, exposure to strong oxidants.

10c Hazardous by-products Tributylamine, charred polystyrene, aromatic acids

and hydrocarbons, organic amines, nitrogen oxides, carbon oxides, chlorinated hydrocarbons.

10d Incompatible materials Strong oxidizing agents (such as HNO₃).

10e Hazardous Polymerization Does not occur



Section 11: Toxicological Information

11a Likely Routes of Exposure Oral, skin or eye contact.

11b Effects of exposure

Delayed None known.
Immediate (acute) None known.
Chronic None known.

11c Toxicity Measures

Skin Adsorption Unlikely.

Ingestion Oral toxicity believed to be low but no LD50 has

been established.

Inhalation Unknown, vapors are very unlikely due to physical

properties (insoluble solid).

11d Toxicity Symptoms

Skin Adsorption Mild rash.

Ingestion Indigestion or general malaise.

Inhalation Unknown.

11e Carcinogenicity None known

Section 12: Ecological information

12a Eco toxicity Not harmful to plant or animal life.

12b Mobility Insoluble.

12c Biodegradability Not biodegradable.

12d Bioaccumulation Insignificant.

12e Other adverse effects Not Harmful to the environment.



Section 13: Disposal Considerations	
13a General considerations	Material is non-hazardous.
13b Disposal Containers	Most plastic and paper containers are suitable.
13c Disposal methods	No specific method necessary.
13d Sewage Disposal	Not recommended.
13e Precautions for incineration	May release tributylamine and toxic vapors when burned.
13f Precautions for landfills	Resins used to remove hazardous materials may then become hazardous mixtures
Section 14: Transportation Information	
14a Transportation Class	Not classified as a dangerous good for transport by land, sea, or air.
14b TDG	Not regulated.
14c IATA	Not regulated.
14d DOT (49 CFR 172.101)	Not Regulated.
Section 15: Regulatory Information	
15a CERCLA	Not regulated
15b SARA Title III	Not regulated
15c Clean Air act	Not regulated
15d Clean Water Act	Not regulated
15e TSCA	Not regulated
15f Canadian Regulations WHMIS TDG	Not a controlled product Not regulated
15g Mexican Regulations	Not Dangerous

Section 16: Other Information

The information provided in this safety data sheet is presented in good faith and believed to be accurate as of the effective data shown above. However, no warranty or guarantee of accuracy, express or implied is given. Regulatory requirements are subject to change and may differ from one location to another. It is the buyer's responsibility to ensure that their activities comply with federal, state, and local laws.

16a Date of Revision 31 March 2015



SODIUM BISULFITE



SIGMA-ALDRICH

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SAFETY DATA SHEET

Version 5.9 Revision Date 05/17/2018 Print Date 07/01/2018

1. PRODUCT AND COMPANY IDENTIFICATION

Product identifiers

Product name Sodium bisulfite

243973 **Product Number** Brand Sigma-Aldrich CAS-No. 7631-90-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

> Company Sigma-Aldrich

3050 Spruce Street SAINT LOUIS MO 63103

USA

Telephone +1 800-325-5832 +1 800-325-5052 Fax

1.4 **Emergency telephone number**

> Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Acute toxicity, Oral (Category 4), H302 Serious eye damage (Category 1), H318 Acute aquatic toxicity (Category 3), H402

For the full text of the H-Statements mentioned in this Section, see Section 16.

GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)

H302 Harmful if swallowed. H318 Causes serious eye damage. H402 Harmful to aquatic life.

Precautionary statement(s)

P264 Wash skin thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P273 Avoid release to the environment. P280 Wear eye protection/ face protection.

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.

P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately

Sigma-Aldrich - 243973 Page 1 of 8

LA-UR-19-22215 **Attachment D** D-63 of 112



call a POISON CENTER/doctor.

P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 **Mixtures**

Synonyms Sodium hydrogensulfite

Hazardous components

Component		Classification	Concentration			
Sodium hydrogensulphite						
CAS-No. EC-No. Index-No.	7631-90-5 231-548-0 016-064-00-8	Acute Tox. 4; H302	90 - 100 %			
Sodium metabisulph	ite					
CAS-No. EC-No.	7681-57-4 231-673-0	Acute Tox. 4; Eye Dam. 1; Aquatic Acute 3; H302, H318.	90 - 100 %			
Index-No.	016-063-00-2	H402				

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

Extinguishing media

Suitable extinguishing media

Dry powder

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

Sigma-Aldrich - 243973 Page 2 of 8

LA-UR-19-22215 **Attachment D** D-64 of 112



5.4 **Further information**

No data available

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Wear respiratory protection. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

For personal protection see section 8.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Do not flush with water. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs. Avoid contact with skin and eyes. Avoid formation of dust and aerosols.

Provide appropriate exhaust ventilation at places where dust is formed.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Never allow product to get in contact with water during storage. Do not store near acids.

Air and moisture sensitive.

Storage class (TRGS 510): 13: Non Combustible Solids

Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control	Basis
			parameters	
Sodium	7631-90-5	TWA	5 mg/m3	USA. ACGIH Threshold Limit Values
hydrogensulphite				(TLV)
	Remarks	Upper Respi	iratory Tract irritation	on
		Eye irritation	ľ	
		Skin irritation		
		Not classifiable as a human carcinogen		
		TWA	5 mg/m3	USA. NIOSH Recommended
			2005	Exposure Limits
		PEL	PEL 5 mg/m3 California permissible e	
			***	limits for chemical contaminants
				(Title 8, Article 107)
Sodium	7681-57-4	TWA	5 mg/m3	USA. ACGIH Threshold Limit Values
metabisulphite				(TLV)
		Upper Respiratory Tract irritation		
		Not classifiable as a human carcinogen		

Sigma-Aldrich - 243973 Page 3 of 8

LA-UR-19-22215 **Attachment D** D-65 of 112



TWA	5 mg/m3	USA. NIOSH Recommended Exposure Limits
PEL	5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

a) Appearance Form: solid No data available b) Odour No data available c) Odour Threshold d) рН No data available

Melting point/freezing Melting point/range: 300 °C (572 °F)

point

Page 4 of 8 Sigma-Aldrich - 243973

LA-UR-19-22215



f)	Initial boiling point and boiling range	No data available
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
I)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	No data available
0)	Partition coefficient: n- octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

Table to be also as a substantial of the state of the sta

Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

Incompatible materials 10.5

Strong oxidizing agents, Strong acids

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Sulphur oxides, Sodium oxides Other decomposition products - No data available In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

No data available

Inhalation: No data available Dermal: No data available

No data available

Sigma-Aldrich - 243973 Page 5 of 8



Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as

probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a

known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's

list of regulated carcinogens.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, chest pain

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No data available

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal Harmful to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Sigma-Aldrich - 243973 Page 6 of 8

LA-UR-19-22215 Attachment D D-68 of 112



Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Sodium metabisulphite)

Reportable Quantity (RQ): 5000 lbs Poison Inhalation Hazard: No

IMDG

Not dangerous goods

IATA

Not dangerous goods

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Acute Health Hazard

Massachusetts Right To Know Components

Sodium hydrogensulphite Sodium metabisulphite	CAS-No. 7631-90-5 7681-57-4	2007-03-01 2007-03-01
Pennsylvania Right To Know Components		
	CAS-No.	Revision Date
Sodium hydrogensulphite	7631-90-5	2007-03-01
Sodium metabisulphite	7681-57-4	2007-03-01

New Jersey Right To Know Components

ew dersey right to know domponents		
	CAS-No.	Revision Date
Sodium hydrogensulphite	7631-90-5	2007-03-01
Sodium metabisulphite	7681-57-4	2007-03-01

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox. Acute toxicity Aquatic Acute Acute aquatic toxicity Serious eye damage Eye Dam. H302 Harmful if swallowed.

H318 Causes serious eye damage. H402 Harmful to aquatic life.

HMIS Rating

Health hazard: 2 Chronic Health Hazard: Flammability: 0 Physical Hazard

Sigma-Aldrich - 243973 Page 7 of 8



NFPA Rating

Health hazard: 2
Fire Hazard: 0
Reactivity Hazard: 0

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 5.9 Revision Date: 05/17/2018 Print Date: 07/01/2018

Sigma-Aldrich - 243973 Page 8 of 8



CAUSTIC SODA/SODIUM HYDROXIDE



MSDS NO:OZ32415 VERSION:026 2010-05-20

The Version Date and Number for this MSDS is : 02/27/2009 - #021

PRODUCT NAME:

CAUSTIC SODA LIQUID (ALL GRADES)

MSDS NUMBER:

QZ32415

DATE ISSUED:

01/07/2009

SUPERSEDES:

11/12/2008

ISSUED BY:

008730

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Distributed by: Univar USA Inc. 17425 NE Union Hill Rd. Redmond, WA 98052 425-889-3400

Trade Name:

Caustic Soda Diaphragm Grade 10%, 15%, 18%, 20%, 25%, 30%, 35%, 40%, 50%, Caustic Soda Rayon Grade 18%, 20%, 25%, 30%, 50%, 50% Caustic Soda Rayon Grade OS, Caustic Soda Membrane 6%, 18%, 20%, 25%, 30%, 48%, 50%, 50% Caustic Soda Membrane OS, 50% Caustic Soda Diaphragm OS, Caustic Soda Low Salt 50%, 25% Caustic Soda Purified, 50% Caustic Soda Purified OS, Caustic Soda Purified OS, Caustic Soda Liquid 70/30, Membrane Blended, 50% Caustic Soda Membrane (Northeast), 50% Caustic Soda Diaphragm (West Coast), 50% Blended Rayon Grade Blended, Membrane Cell Liquor

Synonyms: Sodium hydroxide solution, Liquid Caustic, Lye Solution, Caustic, Lye, Soda Lye

Product Use: Metal finishing, Cleaner, Process chemical, Petroleum industry

2. HAZARDS IDENTIFICATION EMERGENCY OVERVIEW:

Color:

Colorless to slightly colored

Physical State:

Liquid Odorless

Odor: Signal Word:

Danger

MAJOR HEALTH HAZARDS: CORROSIVE. CAUSES BURNS TO THE RESPIRATORY TRACT, SKIN, EYES AND GASTROINTESTINAL TRACT. CAUSES PERMANENT EYE DAMAGE.

MSDS NO: OZ32415 VERSION:026 2010-05-20

PHYSICAL HAZARDS: CORROSIVE. Mixing with water, acid or incompatible materials may cause splattering and release of heat.

ECOLOGICAL HAZARDS: Keep out of water supplies and sewers. This material is alkaline and may raise the pH of surface waters. This material has exhibited moderate toxicity to aquatic organisms.

PRECAUTIONARY STATEMENTS: Avoid breathing vapors or mist. Avoid contact with skin, eyes and clothing. Keep container tightly closed. Wash thoroughly after handling. Use only with adequate ventilation.

POTENTIAL HEALTH EFFECTS:

Inhalation: May cause irritation (possibly severe), chemical burns, and pulmonary edema.

Skin contact: May cause irritation (possibly severe) and chemical burns.

Eye contact: May cause irritation (possibly severe), chemical burns, eye damage, and blindness.

Ingestion: May cause irritation (possibly severe), chemical burns, nausea, and vomiting.

Target Organs Effected: Respiratory System, Skin, Eye

Medical Conditions Aggravated by Exposure: Asthma, Respiratory disorders

See Section 11: TOXICOLOGICAL INFORMATION

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Component	Concentration (by weight %)	CAS - No.
Water	48.5 - 94.5	7732-18-5
Sodium hydroxide	5.5 - 51.5	1310-73-2
Sodium chloride (NaCl)	1 - 5	7647-14-5

4. FIRST AID MEASURES

Inhalation: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. If respiration or pulse has stopped, have a trained person administer basic life support (Cardio-Pulmonary Resuscitation/Automatic External Defibrillator) and CALL FOR EMERGENCY SERVICES IMMEDIATELY.

Skin Contact: Immediately flush contaminated areas with water. Remove contaminated clothing, jewelry, and shoes immediately. Wash contaminated areas with soap and water. Thoroughly clean and dry contaminated clothing before reuse. Discard contaminated leather goods. GET MEDICAL ATTENTION



MSDS NO:0Z32415 VERSION:026 2010-05-20

IMMEDIATELY.

Eye Contact: Immediately flush eyes with a directed stream of water for at least 15 minutes, forcibly holding eyelids apart to ensure complete irrigation of all eye and lid tissues. Washing eyes within several seconds is essential to achieve maximum effectiveness. GET MEDICAL ATTENTION IMMEDIATELY

Ingestion: Never give anything by mouth to an unconscious or convulsive person. If swallowed, do not induce vomiting. Give large amounts of water. If vomiting occurs spontaneously, keep airway clear. Give more water when vomiting stops. GET MEDICAL ATTENTION IMMEDIATELY.

Notes to Physician: The absence of visible signs or symptoms of burns does NOT reliably exclude the presence of actual tissue damage. Probable mucosal damage may contraindicate the use of gastric lavage.

5. FIRE-FIGHTING MEASURES

Fire Hazard: Negligible fire hazard.

Extinguishing Media: Use media appropriate for surrounding fire

Fire Fighting: Move containor from fire area if it can be done without risk. Cool containers with water. Avoid contact with skin.

Sensitivity to Mechanical Impact: Not sensitive.

Sensitivity to Static Discharge: Not sensitive.

Flash point: Not flammable

6. ACCIDENTAL RELEASE MEASURES

Occupational Release:

Wear appropriate personal protective equipment recommended in Section 8 of the MSDS. Completely contain spilled material with dikes, sandbags, etc. Shovel dry material into suitable container. Liquid material may be removed with a vacuum truck. Remaining material may be diluted with water and neutralized with dilute acid, then absorbed and collected. Flush spill area with water, if appropriate. Keep product and flush water out of water supplies and sewers. This material is alkaline and may raise the pH of surface waters with low buffering capacity. Releases should be reported, if required, to appropriate agencies.

7. HANDLING AND STORAGE

Storage Conditions: Store and handle in accordance with all current regulations and standards. Keep container tightly closed and properly labeled. Do not store in aluminum container or use aluminum fittings or transfer lines, as flammable hydrogen gas may be generated. Keep separated

MSDS NO:OZ32415 VERSION:026 2010-05-20

from incompatible substances.

Handling Procedures: Avoid breathing vapor or mist. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. When mixing, slowly add to water to minimize heat generation and spattering.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

CSHA Regulatory Exposure limit(s):

Hazardous

Component CAS-No. CSHA Final PEL OSHA Final PEL OSHA Final PEL

TWA STEL Ceiling

Sodium 1310-73-2 2 mg/m3

hydroxide

Non-Regulatory Exposure Limit(s):

The Non-Regulatory OSHA limits shown in the table are the Vacated 1989 PEL's (vacated by 58 FR 35338, June 30, 1993).

Hazardous

Component CAS-No. ACGIH ACGIH ACGIH OSHA OSHA Ceiling

TWA STEL Ceiling TWA STEL (Vacated)

(Vaca- (Vacated) ted)

Sodium 1310-73-2 2 mg/m3 2 mg/m3

hydroxide

ENGINEERING CONTROLS: Provide local exhaust ventilation where dust or mist may be generated. Ensure compliance with applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Wear chemical safety goggles with a faceshield to protect against eye and skin contact when appropriate. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin and Body Protection: Wear chemical resistant clothing and rubber boots when potential for contact with the material exists. Contaminated clothing should be removed, then discarded or laundered.

Hand Protection: Wear appropriate chemical resistant gloves Protective Material Types: Natural rubber, Neoprene, Nitrile

Hazardous Component Immediately Dangerous to Life/ Health (IDLH)
Sodium hydroxide 10 mg/m3 IDLH

Respiratory Protection: A NIOSH approved respirator with N95 (dust, fume, mist) cartridges may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits, or when symptoms have been observed that are indicative of overexposure. If eye

LA-UR-19-22215

MSDS NO:OZ32415 VERSION:026 2010-05-20

irritation occurs, a full face style mask should be used. A respiratory protection program that meets 29 CFR 1910.134 must be followed whenever workplace conditions warrant use of a respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid

Appearance: Clear to opaque

Color: Colorless to slightly colored

Odorless

Boiling Point/Range: 230 291 F (110 144 C) Freezing Point/Range: -26 to 59 F (-32 to 15 C) Vapor Pressure: 13 - 135 mmHg @ 60 C Vapor Density (air=1): No data available Specific Gravity (water=1): 1.11 1.53 @ 15.6 C

Water Solubility: 100%

14.0 (7.5% solution) pH: No data available Volatility: Evaporation Rate (ether=1): No data available Partition Coefficient (n- No data available

octanol/water):

10. STABILITY AND REACTIVITY

Reactivity/ Stability: Stable at normal temperatures and pressures.

Conditions to Avoid: Mixing with water, acid or incompatible materials may cause splattering and release of large amounts of heat. Will react with some metals forming flammable hydrogen gas. Carbon monoxide gas may form upon contact with reducing sugars, food and beverage products in enclosed spaces.

Incompatibilities/Materials to Avoid: Acids, Halogenated compounds, Prolonged contact with aluminum, brass, bronze, copper, lead, tin, zinc or other alkali sensitive metals or alloys

Hazardous Decomposition Products: Toxic fumes of sodium oxide

Hazardous Polymerization: Will not occur

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA:

LD50 Oral LC50 Inhalation LD50 Dermal Hazardous Component Not listed Not listed 1350 mg/kg (Rabbit) Sodium hydroxide Sodium chloride (NaCl) 3 g/kg (Rat) 42 g/m3 (1 hr-Rat) 10 g/kg (Rabbit)

TOXICITY:

The severity of the tissue damage is a function of its concentration, the length of tissue contact time, and local tissue conditions. After exposure there may be a time delay before irritation and other effects occur. This material is a strong irritant and is corrosive to the skin, eyes, and mucous



MSDS NO:OZ32415 VERSION:026 2010-05-20

membranes. This material may cause severe burns and permanent damage to any tissue with which it comes into contact. Inhalation will cause severe irritation and possible burns with pulmonary edema, which may lead to pneumonitis. Skin contact with this material may cause severe irritation and corrosion of tissue. Eye contact can cause severe irritation, corrosion with possible corneal damage and blindness. Ingestion may cause irritation, corrosion/ulceration, nausea, and vomiting. In general, chronic effects are due to long-term irritation. This material may cause dermatitis. In rare cases reports have noted long-term inhalation causes bronchial inflammatory reaction or obstructive airway dysfunction.

CARCINOGENICITY: This product is not classified as a carcinogen by NTP, IARC or OSHA.

12. ECOLOGICAL INFORMATION

AQUATIC TOXICITY: This material has exhibited moderate toxicity to aquatic organisms. Data provided are for sodium hydroxide.

Freshwater Fish Data: LC50 brook trout: 25 ppm/24 hr LC50 king salmon: 48 ppm

Invertebrate Toxicity Data: EC50 daphnia magna: 100 ppm EC50 shrimp: 33 100 ppm/48 hr EC50 cockle: 330 1000 ppm/48 hr

BIODEGRADATION: This material is inorganic and not subject to biodegradation.

PERSISTENCE: This material is alkaline and may raise the pH of surface waters with low buffering capacity. This material is believed to exist in the disassociated state in the environment.

 ${\tt BIOCONCENTRATION:}$ This material is not expected to bioconcentrate in organisms.

ADDITIONAL ECOLOGICAL INFORMATION: This material has exhibited slight toxicity to terrestrial organisms.

13. DISPOSAL CONSIDERATIONS

Reuse or reprocess, if possible. Dispose in accordance with all applicable regulations. May be subject to disposal regulations: U.S. EPA 40 CFR 261. Hazardous Waste Number(s): D002

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME: Sodium Hydroxide Solution

DOT UN NUMBER: UN1824



MSDS NO: 0Z32415 VERSION:026 2010-05-20

HAZARD CLASS/ DIVISION:

PACKING GROUP:

LABELING REQUIREMENTS:

8 DOT RQ (lbs): RQ 1000 lbs. (Sodium Hydroxide)

II

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

SHIPPING NAME:

Sodium hydroxide solution

UN NUMBER:

UN1824

CLASS: PACKING/RISK GROUP:

15. REGULATORY INFORMATION

U.S. REGULATIONS

OSHA REGULATORY STATUS:

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200) (US).

CERCLA SECTIONS 102a1103 HAZARDOUS SUBSTANCES (40 CFR 302.4): If a release is reportable under CERCLA section 103, notify the state cmergency response commission and local emergency planning committee. In addition, notify the National Response Center at (800) 424-8802 or (202) 4262675.

Hazardous Component

CERCLA Reportable Quantities: 1000 lb (final RQ)

Sodium hydroxide

EPCRA EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30): No components are listed.

EPCRA SECTIONS 311/312 HAZARD CATEGORIES (40 CFR 370.21): Acute Health Hazard

EPCRA SECTION 313 (40 CFR 372.65): No components are listed.

OSHA PROCESS SAFETY (29 CFR 1910.119): Not regulated

NATIONAL INVENTORY STATUS

U.S. INVENTORY STATUS (TSCA): All components are listed or exempt

TSCA 12(b): This product is not subject to export notification

CANADIAN DOMESTIC SUBSTANCE LIST (DSL/NDSL): All components are listed.

STATE REGULATIONS

California Proposition 65: This product is not listed

Hazardous Component

Sodium hydroxide



MSDS NO:OZ32415 VERSION:026 2010-05-20

California Proposition 65 Cancer WARNING: Not Listed California Proposition 65 CRT List - Male Not Listed reproductive toxin: California Proposition 65 CRT List - Female reproductive toxin: Not Listed Massachusetts Right to Know Hazardous Substance List New Jersey Right to Know Hazardous Substance List Listed New Jersey Special Health Hazards Substance List Listed Pennsylvania Right to Know Hazardous Substance List Listed Pennsylvania Right to Know Environmental Hazard List Listed Rhode Island Right to Know Hazardous Substance List Listed

CANADIAN REGULATIONS:

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

WHMIS Classification: E

16. OTHER INFORMATION

 ${\tt HMIS:}$ (SCALE 0-4) (Rated using National Paint & Coatings Association HMIS: Rating Instructions, 2nd Edition)

Health: 3 Flammability: 0 Reactivity: 1

NFPA 704 - Hazard Identification Ratings (SCALE 0-4)

 $\mbox{Health:} \quad \mbox{3} \qquad \qquad \mbox{Flammability:} \quad \mbox{0} \qquad \qquad \mbox{Reactivity:} \quad \mbox{1}$



Univar USA Inc Material Safety Data Sheet

For Additional Information contact MSDS Coordinator during business hours, Pacific time: (425) 889-3400

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Do not use ingredient information and/or ingredient percentages in this MSDS as a product specification. For product specification information refer to a product specification sheet and/or a certificate of analysis. These can be obtained from your local Univar sales office.

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate, Univar makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Univar's control and therefore users are responsible to verify this data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product, or from the publication or use of, or reliance upon, information contained herein.

This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process

LA-UR-19-22215 **Attachment D** D-80 of 112



SULFURIC ACID



RICCA CHEMICAL COMPANY®

Safety Data Sheet

SECTION 1: Identification

1.1. Product Identifier

Trade Name or Designation: Sulfuric Acid, 10% (v/v)

Product Number: 8150

Other Identifying Product Numbers: 8150-1, 8150-16, 8150-16G, 8150-2.5, 8150-32, 8150-5, 8150-55, 8150-5PT

1.2. Recommended Use and Restrictions on Use

General Laboratory Reagent

1.3. Details of the Supplier of the Safety Data Sheet

Company: Ricca Chemical Company

Address: 448 West Fork Drive

Arlington, TX 76012 USA

Telephone: 888-467-4222

1.4. Emergency Telephone Number (24 hours)

CHEMTREC (USA) 800-424-9300 CHEMTREC (International) 1+ 703-527-3887

Product Number: 8150 Page 1 of 12





SECTION 2: Hazard(s) Identification

2.1. Classification of the Substance or Mixture (in accordance with OSHA HCS 29 CFR 1910.1200)

For the full text of the Hazard and Precautionary Statements listed below, see Section 16.

		Hazard	
Hazard Class	Category	Statement	Precautionary Statements
Acute Toxicity - Inhalation	Category 3	H331	P261, P271, P304+P340, P311, P321,
			P403+P233, P405, P501
Skin Corrosion / Irritation	Category 1A	H314	P260, P264, P280, P301+P330+P331,
			P303+P361+P353, P363, P304+P340, P310,
			P321, P305+P351+P338, P405, P501
Eye Damage / Irritation	Category 1	H318	P280, P305+P351+P338, P310
Carcinogenicity	Category 1	H350	P201, P202, P280, P308+P313, P405, P501
Specific Target Organs/Systemic Toxicity Following Single	Category 1	H370	P260, P264, P270, P307+P311, P321, P405,
Exposure			P501
Specific Target Organs/Systemic Toxicity Following	Category 1	H372	P260, P264, P270, P314, P501
Repeated Exposure			
Corrosive to Metals	Category 1	H290	P234, P390, P406
Hazardous to the Aquatic Environment (Acute)	Category 2	H401	P273, P501

2.2. GHS Label Elements

Pictograms:







Signal Word: Danger

Hazard Statements:

Hazard Number	Hazard Statement
H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H331	Toxic if inhaled.
H350	May cause cancer.
H370	Causes damage to organs.
H372	Causes damage to organs through prolonged or repeated exposure.
H401	Toxic to aquatic life.

Product Number: 8150 Page 2 of 12





Precautionary Statements:

Precautionary Number:	Precautionary Number:
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P234	Keep only in original container.
P260	Do not breathe fumes, mist, vapors, or spray.
P261	Avoid breathing fumes, mist, vapors, or spray.
P264	Wash arms, hands and face thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves and eye protection.
P301+P330+P331	IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to
	do. Continue rinsing.
P307+P311	IF exposed: Call a POISON CENTER or physician.
P308+P313	IF exposed or concerned: Get medical attention.
P310	Immediately call a POISON CENTER or physician.
P311	Call a POISON CENTER or physician.
P314	Get medical attention if you feel unwell.
P321	Specific treatment (Wash areas of contact with water. If possible, wipe off areas of contact with dry cloth
	before flushing with water).
P363	Wash contaminated clothing before reuse.
P390	Absorb spillage to prevent material damage.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P406	Store in corrosive resistant container with a resistant inner liner.
P501	Dispose of contents in accordance with local, state, federal and international regulations.

2.3. WHMIS Classification

WHMIS classification is not included based on the recommended option (Option 4) found in the Canada Gazette Part II, Vol. 149, No.3, page 458

2.4. Hazards not Otherwise Classified or Covered by GHS

Data not available.

Product Number: 8150 Page 3 of 12





RICCA CHEMICAL COMPANY®

Safety Data Sheet

SECTION 3: Composition / Information on Ingredients

3.1. Components of Substance or Mixture

Chemical Name	Formula	Molecular Weight	CAS Number	Weight%
Water	H_2O	18.01 g/mol	7732-18-5	83.76%
Sulfuric Acid	H₂SO₄	98.07 g/mol	7664-93-9	16.24%

SECTION 4: First-Aid Measures

4.1. General First Aid Information

Eye Contact: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue

rinsing. Eye contact causes tissue damage and blindness.

Inhalation: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

Skin Contact: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. Skin contact causes burns,

blistering, local necrosis, and membrane ulceration. Burns may be 2nd or 3rd degree.

Ingestion: IF SWALLOWED: rinse mouth. Do NOT induce vomiting. Do not induce vomiting. Give large quantity of water. Call a physician

immediately.

4.2. Most Important Symptoms and Effects, Acute and Delayed

Corrosive liquid. Causes severe burns. Eye contact causes tissue damage and blindness. Ingestion causes corrosion of the mucosa of the mouth, throat and esophagus with stomach discomfort and pain. If ingested, dilute with large quantity of water. Do not induce vomiting. Call a physician. Wash areas of contact with plenty of water for at least 15 minutes. If possible, wipe off areas of contact with dry cloth before flushing with water, as water contact will generate heat. EYE CONTACT: Eye contact causes tissue damage and blindness. SKIN CONTACT: Skin contact causes burns, blistering, local necrosis, and membrane ulceration. Burns may be 2nd or 3rd degree. CHRONIC EFFECTS / CARCINOGENICITY: May affect the skin, liver, kidneys and blood.

4.3. Medical Attention or Special Treatment Needed

Immediately call a POISON CENTER or physician. Specific treatment (Wash areas of contact with water. If possible, wipe off areas of contact with dry cloth before flushing with water).

SECTION 5: Fire-Fighting Measures

5.1. Extinguishing Media

Dry chemical, foam, or carbon dioxide. Reacts with water producing heat and toxic fumes.

5.2. Specific Hazards Arising from the Substance or Mixture

Not combustible. Strong dehydrating agent, which may cause ignition of finely divided materials on contact. Reaction with metals may produce hydrogen gas. Oxides of sulfur may be produced in fire.

5.3. Special Protective Equipment for Firefighters

Wear special protective clothing and positive pressure self-contained breathing apparatus. Butyl rubber, natural rubber, Neoprene, polyethylene, polyvinyl chloride, Teflon, Viton, or Saranex barrier recommended.

Product Number: 8150 Page 4 of 12

LA-UR-19-22215 Attachment D D-85 of 112





RICCA CHEMICAL COMPANY®

Safety Data Sheet

SECTION 6: Accidental Release Measures

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

Wear protective gloves and eye protection.

6.2. Cleanup and Containment Methods and Materials

Keep water away from release. Stop or control the leak, if this can be done without undue risk. Control runoff and isolate discharged material for proper disposal.

SECTION 7: Handling and Storage

7.1. Precautions for Safe Handling and Storage Conditions

Store in corrosive resistant container with a resistant inner liner. As with all chemicals, wash hands thoroughly after handling. Avoid contact with eyes and skin. Protect from freezing and physical damage. Do not mix with bases. Contact with water will generate heat.

SECTION 8: Exposure Controls / Personal Protection

Control Parameters

Chemical Name	Limit Type	Country	Exposure Limit	Information Source
Sulfuric Acid (7664-93-9)	TWA	USA	1 mg/m³ TWA	U.S OSHA - Final PELs - Time
			193	Weighted Averages (TWAs)
Sulfuric Acid (7664-93-9)	TLV-TWA	USA	0.2 mg/m³ TWA (thoracic fraction)	ACGIH - Threshold Limit Values - Time
				Weighted Averages (TLV-TWA)

8.2. Exposure Controls

Engineering Controls: Use only outdoors or in a well-ventilated area. No specific controls are needed. Normal room ventilation is

adequate.

Respiratory Protection: Normal room ventilation is adequate.

Skin Protection: Wear protective gloves and eye protection. Chemical resistant gloves. Eye Protection: Wear protective gloves and eye protection. Safety glasses or goggles.

8.3. Personal Protective Equipment

Wear protective gloves and eye protection. Normal room ventilation is adequate. Chemical resistant gloves. Safety glasses or goggles.

Product Number: 8150 Page 5 of 12





SECTION 9: Physical and Chemical Properties

9.1. Basic Physical and Chemical Properties

Appearance: Colorless liquid

Physical State: Liquid

Odor: Data not available.

Odor Threshold: Data not available.

pH: <1

Melting/Freezing Point: Approximately 0°C

Initial Boiling Point/Range: Approximately 100°C - Approximately 100°C

Flash Point: Data not available.

Evaporation Rate: Data not available.

Flammability: Data not available.

Flammability/Explosive Limits: Data not available.

Vapor Pressure: Data not available.

Vapor Density: Data not available.

Relative Density: 1.11

Solubility: Miscible

Partition Coefficient: Data not available.

Auto-Ignition Temperature: Data not available.

Decomposition Temperature: Data not available.

Viscosity: Data not available.

Explosive Properties: Data not available. **Oxidizing Properties:** Data not available.

SECTION 10: Stability and Reactivity

10.1. Reactivity and Chemical Stability

Stable under normal conditions of use and storage.

10.2. Possibility of Hazardous Reactions

Data not available.

10.3. Conditions to Avoid and Incompatible Materials

Keep only in original container. Organics, chlorates, carbides, fulminates, picrates, alkalines, reducing agents, nitrates, Acetic Acid, oxidizing agents, metals.

10.4. Hazardous Decomposition Products

Will not occur.

Product Number: 8150 Page 6 of 12





SECTION 11: Toxicological Information

11.1. Information on Toxicological Effects

Acute Toxicity - Oral Exposure:

Not applicable.

Acute Toxicity - Dermal Exposure:

Not applicable.

Acute Toxicity - Inhalation Exposure:

Toxic if inhaled. Avoid breathing fumes, mist, vapors, or spray. Use only outdoors or in a well-ventilated area. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician. Specific treatment (Wash areas of contact with water. If possible, wipe off areas of contact with dry cloth before flushing with water). Store in a well-ventilated place. Keep container tightly closed. Store locked up. Dispose of contents in accordance with local, state, federal and international regulations.

Acute Toxicity - Other Information:

LD50, Oral, Rat: 2140 mg/kg (Sulfuric Acid), details of toxic effects not reported other than lethal dose value. LC50, Inhalation, Rat: (Sulfuric Acid) 510 mg/m3/2H, No toxic effect noted.

Skin Corrosion and Irritation:

Causes severe skin burns and eye damage. Do not breathe fumes, mist, vapors, or spray. Wash arms, hands and face thoroughly after handling. Wear protective gloves and eye protection. IF SWALLOWED: rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. Wash contaminated clothing before reuse. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or physician. Specific treatment (Wash areas of contact with water. If possible, wipe off areas of contact with dry cloth before flushing with water). IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Store locked up. Dispose of contents in accordance with local, state, federal and international regulations.

Serious Eye Damage and Irritation:

Causes serious eye damage. Wear protective gloves and eye protection. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing, Immediately call a POISON CENTER or physician.

Respiratory Sensitization:

Not applicable.

Skin Sensitization:

Not applicable.

Germ Cell Mutagenicity:

Not applicable.

Carcinogenicity:

May cause cancer. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves and eye protection. IF exposed or concerned: Get medical attention. Store locked up. Dispose of contents in accordance with local, state, federal and international regulations.

Reproductive Toxicity:

Not applicable.

Product Number: 8150 Page 7 of 12

LA-UR-19-22215 Attachment D D-88 of 112



RICCA CHEMICAL COMPANY®

Safety Data Sheet

Specific Target Organ Toxicity from Single Exposure:

Causes damage to organs. Do not breathe fumes, mist, vapors, or spray. Wash arms, hands and face thoroughly after handling. Do not eat, drink or smoke when using this product. IF exposed: Call a POISON CENTER or physician. Specific treatment (Wash areas of contact with water. If possible, wipe off areas of contact with dry cloth before flushing with water). Store locked up. Dispose of contents in accordance with local, state, federal and international regulations.

Specific Target Organ Toxicity from Repeated Exposure:

Causes damage to organs through prolonged or repeated exposure. Do not breathe fumes, mist, vapors, or spray. Wash arms, hands and face thoroughly after handling. Do not eat, drink or smoke when using this product. Get medical attention if you feel unwell. Dispose of contents in accordance with local, state, federal and international regulations.

Aspiration Hazard:

Not applicable.

Additional Toxicology Information:

Data not available.

SECTION 12: Ecological Information

12.1. Ecotoxicity

Toxic to aquatic life. Avoid release to the environment. Dispose of contents in accordance with local, state, federal and international regulations.

12.2. Persistence and Degradability

Data not available.

12.3. Bioaccumulative Potential

Data not available.

12.4. Mobility in Soil

Data not available.

12.5. Other Adverse Ecological Effects

Data not available.

SECTION 13: Disposal Considerations

13.1. Waste Treatment Methods

Data not available.

Product Number: 8150 Page 8 of 12





SECTION 14: Transportation Information

14.1. Transportation by Land-Department of Transportation (DOT, United States of America)

Sizes: 1 L, 2.5 L, 2.5 L, 2.5 L, 4 L, 10 L, 16 Gal, 20 L, 55 Gal, 500 mL, 500 mL, 500 mL

UN Number: UN2796

Proper Shipping Name: Sulphuric Acid Solution

Hazard Class: 8 Packing Group:

Hazard Placard Labels:



14.2. Transportation by Air - International Air Transport Association (IATA)

Sizes: 1 L, 2.5 L, 2.5 L, 2.5 L, 4 L, 10 L, 16 Gal, 20 L, 55 Gal, 500 mL, 500 mL, 500 mL

UN Number: UN2796

Proper Shipping Name: Sulphuric Acid Solution

Hazard Class: 8 Packing Group: ||

Hazard Placard Labels:



SECTION 15: Regulatory Information

15.1. Occupational Safety and Health Administration (OSHA) Hazards

Not listed.

15.2. Superfund Amendments and Reauthorization Act (SARA) 302 Extremely Hazardous Substances

Sulfuric Acid (CAS # 7664-93-9): 1000 lb EPCRA RQ Sulfuric Acid (CAS # 7664-93-9): 1000 lb TPQ

15.3. Superfund Amendments and Reauthorization Act (SARA) 311/312 Hazardous Chemicals

Sulfuric Acid (CAS # 7664-93-9): 1000 lb final RQ; 454 kg final RQ

15.4. Superfund Amendments and Reauthorization Act (SARA) 313 Toxic Release Inventory (TRI)

Sulfuric Acid (CAS # 7664-93-9): 1.0 % de minimis concentration (acid aerosols including mists, vapors, gas, fog, and other airborne forms of any particle size)

Product Number: 8150 Page 9 of 12

LA-UR-19-22215 Attachment D





RICCA CHEMICAL COMPANY®

Safety Data Sheet

15.5. Massachusetts Right-to-Know Substance List

Sulfuric Acid (CAS # 7664-93-9): Extraordinarily hazardous

15.6. Pennsylvania Right-to-Know Hazardous Substances

Sulfuric Acid (CAS # 7664-93-9): Environmental hazard Sulfuric Acid (CAS # 7664-93-9): Present Water (CAS # 7732-18-5): Present

15.7. New Jersey Worker and Community Right-to-Know Components

Sulfuric Acid (CAS # 7664-93-9): carcinogen; corrosive; reactive - second degree Sulfuric Acid (CAS # 7664-93-9): sn 1761
Sulfuric Acid (CAS # 7664-93-9): SN 1761 500 lb TPQ

15.8. California Proposition 65

Sulfuric Acid (CAS # 7664-93-9): carcinogen, 3/14/2003

15.9. Canada Domestic Substances List / Non-Domestic Substances List (DSL/NDSL)

Sulfuric Acid (CAS # 7664-93-9): Present (DSL) Water (CAS # 7732-18-5): Present (DSL)

15.10. United States of America Toxic Substances Control Act (TSCA) List

Sulfuric Acid (CAS # 7664-93-9): Present Water (CAS # 7732-18-5): Present

15.11. European Inventory of Existing Commercial Chemical Substances (EINECS), European List of Notified Chemical Substances (ELINCS), and No Longer Polymers (NLP)

Not listed.

Product Number: 8150 Page 10 of 12





RICCA CHEMICAL COMPANY®

Safety Data Sheet

SECTION 16: Other Information

16.1. Full Text of Hazard Statements and Precautionary Statements

May be corrosive to metals. Causes severe skin burns and eye damage. Causes serious eye damage. Toxic if inhaled. May cause cancer. Causes damage to organs. Causes damage to organs through prolonged or repeated exposure. Toxic to aquatic life.

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep only in original container. Do not breathe fumes, mist, vapors, or spray. Wash arms, hands and face thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear protective gloves and eye protection.

IF SWALLOWED: rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF exposed: Call a POISON CENTER or physician. Get medical attention if you feel unwell. Specific treatment (Wash areas of contact with water. If possible, wipe off areas of contact with dry cloth before flushing with water). Wash contaminated clothing before reuse. Absorb spillage to prevent material damage.

Store in a well-ventilated place. Keep container tightly closed. Store locked up. Store in corrosive resistant container with a resistant inner liner.

Dispose of contents in accordance with local, state, federal and international regulations.

16.2. Miscellaneous Hazard Classes

Canadian Carcinogenicity Hazard Class: Not Applicable.

Physical Hazards Not Otherwise Classified (PHNOC): Not Applicable.

Health Hazards Not Otherwise Classified (HHNOC): Not Applicable.

Biohazardous Infectious Materials Hazard Class: Not Applicable.

16.3. National Fire Protection Association (NFPA) Rating

Health: 3
Flammability: 0
Reactivity: 1
Special Hazard:



16.4. Document Revision

Last Revision Date: 5/14/2018

Product Number: 8150 Page 11 of 12





DISCLAIMER

When handled properly by qualified personnel, the product described herein does not present a significant health or safety hazard. Alteration of its characteristics by concentration, evaporation, addition of other substances, or other means may present hazards not specifically addressed herein and which must be evaluated by the user. The information furnished herein is believed to be accurate and represents the best data currently available to us. No warranty, expressed or implied, is made and RICCA CHEMICAL COMPANY assumes no legal responsibility or liability whatsoever resulting from its use.

Product Number: 8150 Page 12 of 12



WEST W-126



MATERIAL SAFETY DATA SHEET

HMIS RATING: HEALTH 1 FLAMMABILITY 1 REACTIVITY 0 OTHER B

WEST W-126

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:

WEST W-126 Flocculent

PRODUCT DESCRIPTION:

WEST W-124 is an ionic co-polymer used as a flocculent in

wastewater treatment processes.

MANUFACTURER:

Water & Energy Systems Technology, Inc.

24 HR. EMERGENCY TELEPHONE NUMBER

Chem-Tel (U.S.): (800) 255-3924

13109 Arctic Circle

Santa Fe Springs, CA 92801 Customer Service: (562) 921-5191

2. COMPOSITION / INFORMATION ON INGREDIENTS

EXPOSURE LIMITS

Chemical Name	CAS#	OSHA PEL	ACGIH TLV
2-Propenoic acid, sodium salt, polymer with 2-propenamide	25085-02-3	Not Established	Not Established
Petroleum distillates, hydro treated light	64742-47-8	Not Established	Not Established
Poly(oxy-1,2-ethanediyl), α-(4-nonylphenyl)-φ-hydroxy-, branched	127087-87-0	Not Established	Not Established

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

PRIMARY ROUTES OF ENTRY: Eye or Skin contact. PHYSICAL APPEARANCE: White or off-white liquid. ODOR: Slight, mild odor.

IMMEDIATE CONCERNS: Eye and skin irritant.

PRECAUTIONARY MEASURES: Do not get in eyes, on skin, on clothing. Wash thoroughly after handling. Avoid prolonged or repeated inhalation of dust or skin contact. Slip hazard when wet. SIGNS & SYMPTOMS OF EXPOSURE: Contact with the eye may produce irritation and/or redness. Prolonged or repeated skin contact tends to remove skin oils, possibly leading to dry skin, irritation and/or dermatitis. Vapors may irritate eyes and respiratory tract, and result in headache or dizziness. CONDITION AGGRAVATED BY EXPOSURE: Existing skin conditions.

CARCINOGENICITY: This product's ingredients are not found in the Federal or Cal OSHA, NTP, IARC lists of suspected cancer causing agents.

4. FIRST AID MEASURES

EYES: Immediately flush eyes with plenty of water for at least 15 minutes. Call a physician. SKIN: Remove contaminated clothing and launder before reuse. Wash effected area with soap and water.

INGESTION: Consult a physician. Never give anything by mouth to an unconscious person. **INHALATION:** Remove to fresh air. If symptoms persist, consult a physician.

Page 1 of 4

Water & Energy Systems Technology, Inc. 13109 Arctic Circle – Santa Fe Springs, CA 90670 - Telephone (562) 921-5191

MATERIAL SAFETY DATA SHEET WEST W-126

5. FIRE FIGHTING MEASURES

Flash Point: > 200° F (> 93 ° C) Flash Point Method Used: PMCC

Flammable Limits in Air (Lower - % by volume): Not Evaluated Flammable Limits in Air (Upper - % by volume): Not Evaluated

Autoignition: Not Evaluated

Sensitivity to Mechanical Impact: None Sensitivity to Static Discharge: Not Evaluated.

Fire Fighting Extinguishing Media: Carbon dioxide, dry chemical or foam.

Fire Fighting Equipment: Firefighters should wear normal protective equipment. SCBA is recommended

for confined areas. Cool exposed drums or tanks with water.

Fire and Explosion Hazards: Wetted product presents an extreme slip hazard. Pedestrian and vehicular

traffic must proceed with caution where even a small amount of wet product may exist.

Extinguishing Media to Avoid: Water may create a slip hazard with product.

Hazardous Combustion Products: Oxides of carbon and nitrogen.

6. ACCIDENTAL RELEASE MEASURES

Accidental Release Measures: Remove all ignition sources. Dike area to control run off and collect spill in appropriate container(s). Use an inert absorbent such as vermiculite to collect residual liquid. Then water wash area to waste treatment to eliminate slip hazard.

Water Spill: Note: The petroleum distillates in this product are classified as an oil under Section 311 of the Clean Water Act. Spills, entering (A) surface waters or (B) any water courses or sewers entering or leading to surface water, that cause a sheen must be reported to the National Response Center at 800-424-8802.

7. HANDLING AND STORAGE

Other Handling Information: Avoid high temperatures and open systems to minimize vapor release and exposures. Keep containers closed and properly labeled. Do not reuse containers before contents are completely removed, and the container is properly cleaned and reconditioned. (Refer also to Section VII). Good personal hygiene practices can reduce potential exposure. Wash with soap and water following any contact with this product, as well as before breaks and meals. Shower and change clothing at end of work shift. If clothing becomes contaminated, remove and launder or dry-clean before reuse.

Storage Information: Product may be difficult to handle if cold. Maintain temperature between 20°C and 30°C.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Skin Protection: Chemical resistant gloves.

Respiratory Protection: Not required under normal operating conditions.

Eye Protection: Full side shield safety glasses or goggles (ANSI Z87.1 standard).

Engineering Controls: Recommended general area ventilation.

Additional Information: Provide eyewash station(s). Select additional protective equipment (eg apron,

face shield, etc.), depending on conditions of use.

Page 2 of 4



MATERIAL SAFETY DATA SHEET **WEST W-126**

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form: Color:

Liquid

Odor:

White to off-white

Odor Threshold:

Slight hydrocarbon oil like odor

Physical State:

Not applicable Liquid

Solubility in Water:

Soluble, solubility limited by viscosity

Vapor Pressure:

Not Evaluated

Specific Gravity: Boiling Point:

Melting Point: Freezing Point: **Decomposition Temperature:** Not Established Not Applicable **Not Applicable Not Evaluated**

Evaporation Rate: Vapor Density:

Not Evaluated Not Evaluated

VOC: pH:

Not Evaluated Not Established

10. STABILITY AND REACTIVITY

Materials to Avoid: Strong oxidants.

Stability: Stable.

Hazardous Polymerization: Will not occur.

Hazardous Decomposition Products: Thermal decomposition or combustion may produce oxides of carbon and nitrogen, various hydrocarbons, ammonia and/or hydrogen chloride vapor. Vapor may be irritating or harmful.

incompatibility: Strong oxidants such as liquid chlorine, enriched gaseous or liquid oxygen, and sodium or calcium hypochlorite.

11. TOXICOLOGICAL INFORMATION

Acute and Chronic Toxicity:

A: General Product Information

Eye and skin Irritant. May aggravate existing medical conditions such as rashes, allergies or other sensitive areas. Symptoms may include reddening, swelling of affected areas with possible itching, burning or other discomfort.

B: Acute Toxicity - LD50/LC50

LC50:

Ceriodaphnia dubia

48 hours: 11.0 ppm

LC50:

Pimphales promealas 48 hours: 31.4 ppm

Carcinogenicity:

Not listed as a carcinogen by IARC, NTP, OSHA, or ACGIH.

12. ECOLOGICAL INFORMATION

Ecotoxicity

A: General Product Information

C.O.D.:

2,176,000 mg/l

B.O.D.: 548,000 mg/l

Page 3 of 4

MATERIAL SAFETY DATA SHEET WEST W-126

13. DISPOSAL CONSIDERATIONS

RCRA Hazard Class: This product, when unadulterated, is not a RCRA regulated hazardous waste. Waste Disposal Method: Disposal must be arranged in accordance with local, state and federal regulations. Care must be taken to prevent environmental contamination from the disposal of material, residues and containers.

14. TRANSPORT INFORMATION

DOT:

Proper Shipping Name:

NOT A DOT/IMO HAZARDOUS MATERIAL

IATA:

Proper Shipping Name:

NOT HAZARDOUS FOR TRANSPORT BY AIR

IMDG:

Proper Shipping Name:

NOT A DOT/IMO HAZARDOUS MATERIAL

Department of Transportation: This product is considered to be an oil per the definitions in 49 CFR 130.2. If packed in a container with a capacity of 3,500 gallons or more, the Communication requirements at 49 CFR 130.11 and the Response Plan Requirements at 49 CFR 130.31 and 130.33 apply to Domestic transportation by motor vehicles and rolling stock.

Notification of releases to the National Response Center (NRC), 800-424-8802, may be necessary. In the Washington, DC metropolitan area, call 202-426-2675.

15. REGULATORY INFORMATION

US Federal Regulations:

Chemical Weapons Convention (CWC): This product does not contain any chemicals listed under the Chemical Weapons Convention Schedules of Chemicals.

16. OTHER INFORMATION

DATE PREPARED: 2/21/2006

MSDS No: W126

MANUFACTURER DISCLAIMER: The Information contained herein is provided in good faith and believed to be correct as of the date hereof. However, WEST, Inc. makes no representation as to the comprehensiveness or accuracy of the information. It is expected that individuals receiving the information will exercise their independent judgement in determining its appropriateness for a particular purpose. Accordingly, WEST, Inc. will not be responsible for damages of any kind resulting from the use of or reliance upon such information. No representations, or warranties, either expressed or implied, of merchantability fitness for a particular purpose or of any other nature are made hereunder with respect to the information set fourth herein or to the product to which the information refers.

Page 4 of 4



Bright Dyes® FLT Yellow/Green Liquid



Issue Date: 04-Oct-2013 Revision Date: 06-Feb-2017 Version Number: 1.1

1. Identification

Product Identifiers

Product Name: Bright Dyes® FLT Yellow/Green Liquid

Product Number: 106001

Recommended Use & Restrictions on Use

Water tracing & leak detection dye

Manufacturer/Supplier

Kingscote Chemicals, Inc. 3334 South Tech Blvd. Miamisburg, OH 45342

U.S.A.

Emergency Telephone Number

Company Telephone Number: (937) 886-9100

Emergency Telephone (24 hr): INFOTRAC (800) 535-5053 (North America)

+1-352-323-3500 (International)

2. Hazards Identification

Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least

15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs:

Get medical advice/attention.

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek

medical attention immediately.

Page 1 of 6

Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give

anything by mouth to an unconscious person. Get medical attention if large

quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation.

Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the

system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media

Water spray (fog). Carbon dioxide (CO2). Dry chemical. Regular foam.

Unsuitable Extinguishing Media

Not determined

Specific Hazards Arising from the Chemical

Product is not flammable. Burning/combustion may produce oxides of carbon and nitrogen (NOx).

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or

groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area

with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices.

Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing

should be thoroughly washed before reuse.

Page 2 of 6



Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

None apparent

Not determined

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry, and well-

ventilated area. Keep from freezing.

Incompatible Materials Acids.

8. Exposure Controls / Personal Protection

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection Goggles.

Skin & Body Protection Rubber gloves. Suitable protective clothing.

Respiratory Protection No protection is ordinarily required under normal conditions of use.

Handle in accordance with good industrial hygiene and safety practices. **Hygiene Measures**

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

Odor **Physical State** Liquid Appearance Yellow/green liquid **Odor Threshold**

Color Yellow/green

Property **Values** рΗ >8.0 Melting/Freezing Point ~32° F **Boiling Point/Range** ~212° F **Flash Point** Not applicable

Evaporation Rate 1.8

Flammability (solid, gas) Liquid - not applicable **Upper Flammability Limits** Not applicable **Lower Flammability Limits** Not applicable Vapor Pressure Not applicable

Vapor Density 0.6

Not applicable **Relative Density Specific Gravity** Not determined Solubility Highly soluble in water **Partition Coefficient** Not determined Auto-ignition Temperature Not determined **Decomposition Temperature** Not determined Viscosity Not determined

Page 3 of 6

Revision Date: 06-Feb-2017

Bright Dyes® FLT Yellow/Green Liquid

10. Stability and Reactivity

Reactivity

Not reactive under normal conditions.

Chemical Stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials

Acids. Strong oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation Avoid breathing vapors or mists.

Ingestion Do not ingest.

Skin Contact May cause an allergic skin reaction.

Eye Contact Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure

May cause an allergic skin reaction.

Numerical Measures of Toxicity

Not determined

Symptoms Associated with Exposure

See Section 4 of this SDS for symptoms.

Carcinogenicity

NTP None

IARC None

OSHA None

Page 4 of 6

Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

12. Ecological Information

Ecotoxicity

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Not available

Persistence/Degradability

Not determined

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. Disposal Considerations

Waste Disposal Methods

Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

<u>Note</u>

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

OMDG Not regulated

15: Regulatory Information

International Inventories

TASCA This product is not subject to TSCA 12(b) reporting requirements.

U.S. Federal Regulations

CERCLA This material, as supplied, does not contain any substances regulated as

hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Page 5 of 6

Bright Dyes® FLT Yellow/Green Liquid

Revision Date: 06-Feb-2017

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization

Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of

Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants

pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable

state right-to-know regulations.

16: Other Information

HMIS Health Hazards 1	Flammability 0	Instability O	Special Hazards Not determined		
<u>NFPA</u> Health Hazards 1	Flammability O	Physical Hazards O	Personal Protection B		
Issue Date	04-Oct-2013				
Revision Date	06-Feb-2017				
Revision Note	Content Review				

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Page 6 of 6



Bright Dyes® FLT Yellow/Green Tablets





Issue Date: 09-Nov-2013 Revision Date: 06-Feb-2017 Version Number: 2.1

1. Identification

Product Identifiers

Product Name: Bright Dyes® FLT Yellow/Green Tablet

Product Number: 101101

Recommended Use & Restrictions on Use

Water tracing & leak detection dye

Manufacturer/Supplier

Kingscote Chemicals, Inc. 3334 South Tech Blvd. Miamisburg, OH 45342

U.S.A.

Emergency Telephone Number

Company Telephone Number: (937) 886-9100

Emergency Telephone (24 hr): INFOTRAC (800) 535-5053 (North America)

+1-352-323-3500 (International)

2. Hazards Identification

Classification

This chemical does not meet the hazardous criteria set forth by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

3. Composition/Information on Ingredients

This product is not hazardous according to OSHA 29 CFR 1910.1200. Components not listed are not hazardous or are below reportable limits.

4. First-Aid Measures

First-Aid Measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least

15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Wash thoroughly with plenty of soap and water. If skin irritation occurs:

Get medical advice/attention.

Inhalation Remove to fresh air. If breathing is difficult, administer oxygen; seek

medical attention immediately.

Page 1 of 6

Bright Dyes® FLT Yellow/Green Tablet

Revision Date: 06-Feb-2017

Ingestion Rinse mouth. DO NOT induce vomiting. Drink plenty of water. Never give

anything by mouth to an unconscious person. Get medical attention if large

quantities were ingested or if nausea occurs.

Most Important Symptoms and Effects

Symptoms Will cause staining of the skin on contact. May cause eye irritation.

Inhalation of dust may cause respiratory irritation. Ingestion may cause urine to be a yellow/green color until the dye has been washed through the

system.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to Physician Treat symptomatically.

5. Fire-Fighting Measures

Suitable Extinguishing Media

Water spray (fog). Carbon dioxide (CO2). Dry chemical.

Unsuitable Extinguishing Media

Not determined

Specific Hazards Arising from the Chemical

Remote possibility of dust explosion. Burning may produce oxides of carbon and nitrogen (NOx).

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Use personal protective equipment as recommended in Section 8.

Environmental Precautions Prevent from entering into soil, ditches, sewers, waterways and/or

groundwater. See Section 12 and Section 13.

Methods and Material for Containment and Cleaning Up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Sweep up and collect into suitable containers for disposal. Flush area

with water.

7. Handling and Storage

Precautions for Safe Handling

Advice on Safe Handling Handle in accordance with good industrial hygiene and safety practices.

Use personal protection recommended in Section 8. Avoid contact with skin, eyes, or clothing. Avoid breathing dusts. Contaminated clothing

should not be allowed out of the workplace.

Page 2 of 6

Bright Dyes® FLT Yellow/Green Tablet Revision Date: 06-Feb-2017

Conditions for Safe Storage, Including Incompatibilities

Storage Conditions Keep container tightly closed and store in a cool, dry, and well-

ventilated area. Store away from heat, sparks, open flame or any other

ignition source.

Incompatible Materials Bromine trifluoride. Lithium. Strong acids, bases, and oxidizing agents.

8. Exposure Controls / Personal Protection

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Eyewash stations. Showers.

Individual Protection Measures, Such as Personal Protective Equipment:

Eye/Face Protection Avoid contact with eyes.

Skin & Body Protection Rubber gloves. Suitable protective clothing.

Respiratory Protection Use NIOSH-approved dust mask if dusty conditions exist.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practices.

9. Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

Physical StateSolidOdorNone apparentAppearanceOrange tabletOdor ThresholdNot determined

Color Orange

Property Values pН Not applicable **Melting/Freezing Point** Not applicable **Boiling Point/Range** Not applicable **Flash Point** Not applicable **Evaporation Rate** Not applicable Flammability (solid, gas) Not flammable **Upper Flammability Limits** Not applicable **Lower Flammability Limits** Not applicable **Vapor Pressure** Not applicable **Vapor Density** Not applicable **Relative Density** Not applicable **Specific Gravity** Not applicable

Solubility Highly soluble in water with small amounts of insoluble residue

Partition Coefficient Not determined
Auto-ignition Temperature
Decomposition Temperature
Viscosity Not determined
Not determined
Not determined

Page 3 of 6

Revision Date: 06-Feb-2017



Bright Dyes® FLT Yellow/Green Tablet

10. Stability and Reactivity

Reactivity

Not reactive under normal conditions.

Chemical Stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Keep separated from incompatible substances. Keep out of reach of children.

Incompatible Materials

Bromine trifluoride. Lithium. Strong acids, bases, and oxidizing agents.

Hazardous Decomposition Products

Oxides of carbon and nitrogen (NOx).

11: Toxicological Information

Information on Likely Routes of Exposure

Inhalation Avoid inhalation of dust.

Ingestion Do not ingest.

Skin Contact May cause an allergic skin reaction.

Eye Contact Avoid contact with eyes.

Delayed, Immediate, and Chronic Effects from Short- and Long-Term Exposure

May cause an allergic skin reaction.

Numerical Measures of Toxicity

Not determined

Symptoms Associated with Exposure

See Section 4 of this SDS for symptoms.

Carcinogenicity

NTP None

IARC None

OSHA None

Page 4 of 6

Revision Date: 06-Feb-2017

Bright Dyes® FLT Yellow/Green Tablet

12. Ecological Information

Ecotoxicity

This product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Not available

Persistence/Degradability

This product is biodegradable.

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. Disposal Considerations

Waste Disposal Methods

Dispose of in accordance with federal, state, and local regulations.

Contaminated Packaging

Do not re-use empty containers. Dispose of containers in accordance with federal, state, and local regulations.

14. Transport Information

<u>Note</u>

See current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

OMDG Not regulated

15: Regulatory Information

International Inventories

Not determined

U.S. Federal Regulations

CERCLA This material, as supplied, does not contain any substances regulated as

hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund

Page **5** of **6**

Bright Dyes® FLT Yellow/Green Tablet

Revision Date: 06-Feb-2017

Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization

Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of

Federal Regulations, Part 372.

CWA (Clean Water Act) This product does not contain any substances regulated as pollutants

pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

U.S. State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know This product does not contain any substances regulated under applicable

state right-to-know regulations.

16: Other Information

HMIS Health Hazards 1	Flammability O	Instability O	Special Hazards Not determined
NFPA Health Hazards 1	Flammability O	Physical Hazards O	Personal Protection B
Issue Date	09-Nov-2013		
Revision Date	06-Feb-2017		
Revision Note	Content Review		

<u>Disclaimer</u>

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Page 6 of 6