U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 8
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
STATEMENT OF BASIS

PERMITTEE:	United States Department of the Interior Fish and Wildlife Service
FACILITY NAME:	Rocky Mountain Arsenal National Wildlife Refuge
PERMIT NO.:	CO-0035009
RESPONSIBLE OFFICIAL:	David Lucas Wildlife Refuge Manager 6550 Gateway Road, Headquarters Commerce City, CO 80022 Email: david_lucas@fws.gov
FACILITY CONTACT:	David Lucas Wildlife Refuge Manager Office Telephone: 303-729-2202
OPERATOR INFORMATION:	Keith Auer Water Operations Specialist Navarro R&E, Inc. Rocky Mountain Arsenal 6550 Gateway Road Commerce City, CO 80022 Telephone: 720-625-3623
PERMIT TYPE:	Colorado Federal Facility, Renewal

Summary of Specific Changes from the Previous EPA Issued Permit

1. If the results of the initial two (2) annual chronic Whole Effluent Toxicity (WET) tests show no chronic toxicity present in the discharge, further testing for chronic WET is not required. If chronic toxicity is indicated in any of the first two (2) annual tests, the Permittee shall follow the steps in Section 1.3.2.3.5 of the Permit.

2. Monitoring Location Study Plan is removed to allow an alternate compliance monitoring location for pollutant samplings. The monitoring location will be at the tap on the Rocky Mountain Arsenal (RMA) Recycled Water Pipeline (RMWP) at the Dechlorination Building at 56th Avenue and Uvalda Street, Commerce City, CO.

1. INTRODUCTION

This statement of basis (SoB) is for the re-issuance of a NPDES permit (the Permit) to the Rocky Mountain Arsenal National Wildlife Refuge (Refuge). The Permit establishes discharge limitations for any discharge of water from the facility. The SoB explains the nature of the discharges, and EPA's

decisions for limiting the pollutants in the wastewater, as well as the regulatory and technical basis for these decisions.

EPA Region 8 is the Permitting issuing authority for Colorado federal facilities and provides implementation of federal and state environmental laws within Colorado.

2. BACKGROUND INFORMATION

The SoB is for discharge of treated domestic wastewater into Lower Derby Lake located within the exterior boundaries of the Refuge. The Refuge is located in Commerce City, Colorado near 64th Avenue and Peoria St. in Adams County. The treated domestic wastewater originates from the Denver Water Recycled Water Treatment Plant located near 58th Avenue and York St. in Denver, Colorado.

The Refuge is a 15,000-acre urban national wildlife refuge administered by the U.S. Fish and Wildlife Service (USFWS) to conserve and enhance native fish and wildlife species and their habitats and to provide wildlife-based recreation and interpretation opportunities for refuge visitors. The Refuge includes four surface water lakes or reservoirs: Lake Ladora, Lake Mary, and Upper and Lower Derby Lakes. USFWS manages a catch and release fishery on the lakes as part of the public activities at the Refuge. The Refuge encircles a 1,000-acre area under the jurisdiction of the U.S. Army.

The Refuge is located on the RMA site which was established by the U.S. Army as a munitions and chemical warfare agent manufacturing facility in 1942 to support combat operations in World War II. After World War II ended, the Army encouraged private industry to lease portions of the facility for manufacturing. The Julius Hyman Company began pesticide manufacturing on the South end of the RMA in 1946. The Shell Corporation purchased the assets of the pesticide manufacturer in 1952 and continued production of pesticides until 1982.

In 1984, the Army began a systematic investigation under the Comprehensive Environmental Response Compensation and Liability and Act (CERCLA or Superfund) for environmental contamination at the RMA from the chemical warfare and pesticide manufacturing activities. As a result of the investigation under Superfund, the RMA site was listed on the National Priorities List (NPL) in 1987. The Army, Shell and EPA entered into a Federal Facilities Agreement (FFA) in the late 1980s and since then, all environmental contamination investigation and remedial activity has been managed under EPA Superfund program. The Superfund investigation and FFA led to a Record of Decision (ROD) which identified roles and responsibilities for all parties involved in cleanup efforts. There is a ROD for the On-Site (On-Post) and Off-Site portions of the remedial effort. The Army, EPA, and the Colorado Department of Public Health and Environment (CDPHE) signed both RODs. The USFWS and Shell concurred with the On-Post ROD.

The majority of RMA was designated as a National Wildlife Refuge per the Rocky Mountain Arsenal National Wildlife Refuge Act of 1992 (Refuge Act). As components of the remedy have been completed and the certain portions of RMA land deleted from the NPL, those lands have been transferred to the USFWS to oversee as part of the Refuge. Refuge property must be managed in accordance with the FFA, On-Post ROD and Refuge Act. On-Post land restrictions include prohibitions on the construction of basements (without further study), use of water on the site as a source of potable water, hunting and fishing for consumptive use, and residential, industrial, and agricultural use. The FFA institutional controls also require preservation and management of wildlife habitat to protect endangered species, migratory birds and bald eagles.

The RMA site was selected as a Return to Use demonstration project in 2010 (https://semspub.epa.gov/work/08/1570703.pdf), in recognition of how EPA's partnership with the Army, CDPHE, USFWS, and Shell Oil has led to the creation of nearly 14,700 acres of National Wildlife Refuge land just 10 miles from downtown Denver.

More information on the Superfund activities at the RMA can be found on EPA Region8 web site at https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0800357. Currently the day to day management of Superfund activities at the RMA is performed by the CDPHE Hazardous and Solid Waste Division.

More information on the Refuge can be found on the U.S. Fish and Wildlife Agency Website at https://www.fws.gov/refuge/Rocky_Mountain_Arsenal/

A map showing the location of the lake discharge and surrounding area is depicted as Figure 1 below. Water flows from Upper Derby Lake to Lower Derby Lake to Lake Ladora, and then to Lake Mary, and finally water leaves the RMA. In addition, the USFWS has the option to put water directly into Lake Mary or bypass it.

Figure 1. Rocky Mountain Arsenal National Wildlife Refuge

Table 1a and 1b below are summaries of the discharge monitoring report (DMR) self-monitoring results for outfall 001 from May 2015 – March 2020. The RMA only discharged twice during this permit term (1. December/2016-Feburary/2017 and 2. January 2018-March/2018). It shows there were total residual chlorine (TRC), zinc, and pH exceedances in table 1a. The TRC results appear to be very high. This may be a result of unit conversion in the DMR system.

Table 1a. Summary of Self-Monitoring Results for Outfall 001 May 2015 – March 2020

Effluent Characteristic	30-Day Average			Daily Maximum			2-yr Rolling Average			# of samples	Effluent Limitation		
	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.	Max.		30-Day	Daily	2-yr
TSS, mg/L	1.70	2.86	4.80	1.70	2.86	4.80	N/A	N/A	N/A	5	30	45	N/A
E. Coli, no./100 mL	0	0	0	0	0	0	0	0	0	4	126	252	20
Ammonia as N, mg/L													
January	80	148.5	217	80	148.5	217	217	217	217	2	5100	13000	600
February	80	279	478	80	279	478	195	195	195	2	4700	11000	600
March	530	530	530	530	530	530	251	251	251	1	3200	7300	600
April	No Discharge										1900	6100	600
May	No Discharge										2400	7900	600
June	No Discharge										3000	10000	600
July	No Discharge										2300	9700	600
August	No Discharge										1900	7900	600
September	No Discharge										2300	8700	600
October	No Discharge										3400	11000	600
November	No Discharge										3700	11000	600
December	No Discharge										3700	8900	600
Boron, trec, mg/L	106	178	210	N/A	N/A	N/A	160	180	190	6	750	N/A	280
Chloride, mg/L	105	124	172	N/A	N/A	N/A	106	115	120	6	250	N/A	130
Chlorine, Total Residual, µg/L	3.5	65	170	8	109	210	No data	No data	No data	2	11	19	1.7
Copper, pd, mg/L	2.55	6.98	9.18	2.55	6.98	9.18	7	7.76	9.18	6	13	20	11
Nitrate, total, mg/L	2.2	3.25	5.7	N/A	N/A	N/A	2.5	3.17	3.6	6	100	N/A	20
Manganese, trec, mg/L	2.15	7.344	15.2	2.15	7.344	15.2	6.9	11.05	15.2	5	200	3417	64
Selenium, mg/L	0.44	2.27	5.69	0.14	2.21	5.69	0.94	1.57	2.2	5	4.6	18.4	3
Zinc, pd, mg/L	27	46	56	45.5	44.95	55.9	45.5	49.9	50.8		175	231	43
pH	6.37-7.56										6.5-9.0		
Oil and Grease, mg/L	0										<10		

Table 1b. Summary of Self-Monitoring Results for Outfall 001 May 2015 – March 2020

				# of Samples	WQS	
Monitoring parameters	Min	Avg	Max		Acute	Chronic
Flow, mgd	1.1	1.15	1.2			
Temperature, °C	12.30	15.10	17.00	3	29.2 (Apr-Dec)	26.2
					24.1 (Jan-Mar)	13.1
Hardness, total as $CaCO_3$, mg/L	151	177	210	6		
Chromium VI, d, mg/L	1.6	4.9	7.5	3	16	11
Cyanide, WAD, mg/L	2.9	4	7	6	5	N/A
Mercury, Total, mg/L (Low level)	0.0021	1.19	3.56	6	N/A	0.01
Nitrite, total, mg/L	0	0.105	0.42	4	N/A	0.5
Kjeldahl Nitrogen, total, mg/L	0.32	2.8	8.6	4		
Phosphorous, total, mg/L	0.019	0.04	0.05	6		
WET, Chronic	Pass 3 tests in 2016, 2017 and 2018			3		

3. Receiving Water Classification, Uses and Criteria

The vast majority of water that fills the lakes is surface water. Surface water arrives at the lakes from both Refuge lands and from upstream in Denver/Aurora areas. RMA also has access to four groundwater wells. However, RMA is no longer connected to city tap water. RMA signed the latest nonportable water lease agreement with Denver Water in 2008. This agreement allows RMA to occasionally receive treated domestic wastewater sent via pipeline from the Denver Water Recycled Water Plant to Lower Derby Lake in the Refuge when the water level is low. Outfall 001 is the inlet for the Denver Water recycled water pipe from the Dechlorination Building and is located at longitude 39.817187 N and longitude 104.845786 W.

Lower Derby Lake has a surface area of 71 acres and a volume of 500 acre-feet at full pool depth. Lower Derby Lake has the largest storage capacity. Lower Derby Lake flows downstream to most other reservoirs. It is also closest to the RMA Recycled Water Pipeline (RMWP) at the Dechlorination Building at 56th Avenue and Uvalda Street. The RMA Manager indicates the Denver Water recycled water is discharged to the Lower Derby Lake is because these items allow most flexibility and decreased operational costs in managing water levels. They also allow for the shortest pipeline to transport recycled water. This is also likely the least disturbance to vegetation and other resources on the Refuge.

All four lakes located within the Refuge are currently classified by the Colorado Water Quality Control Commission (WQCC) as waters of the State of Colorado and all applicable water quality standards are contained within the Upper South Platte River Basin under Regulation #38, segment 22b. The current uses are Agriculture, Warm Water Aquatic Life 2, and Recreation E. Applicable water quality criteria for Segment 22b are listed in Table 2.

Lake Mary and Outfall 001 is more than 5.5 miles to the South Platte River, segment 15 in Colorado Regulation 38. Segment 15 has the water supply classification. It is very unlikely that the minimal discharges from RMA lakes regularly reaches the South Platte River per RMA Manager information. Since the discharge is more than one mile away from the downstream water supply, EPA is not required to evaluate the downstream water supply WQS criterion and conduct evaluation for per-and polyfluoroalkyl substances (PFAS) according to the criteria in the CDPHE PFAS Policy 20-1.

TABLE 2. Stream Classification and Water Quality Standard (WQS) for Segment 22b Upper South Platte River Basin

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS
Upper South Platte River Basin

22b. Lakes and reservoirs located in the Rocky Mountain Arsenal National Wildlife Refuge

COSPUS22B	Classifications
Designation	Agriculture
Reviewable	Aq Life Warm 2
	Recreation E
Qualifiers:	
Other:	
*Uranium(acute) = See 38.5(3) for details.	
*Uranium(chronic) = See 38.5(3) for details.	

Physical and Biological	DM	MWAT
Temperature °C	WL	WL
	acute	chronic
D.O. (mg/L)	---	5.0
pH	6.5 - 9.0	---
chlorophyll a (ug/L)	---	---
E. Coli (per 100 mL)	---	126
Inorganic (mg/L)		
	acute	chronic
Ammonia	TVS	TVS
Boron	---	0.75
Chloride	---	---
Chlorine	0.019	0.011
Cyanide	0.005	---
Nitrate	100	---
Nitrite	---	0.5
Phosphorus	---	---
Sulfate	---	---
Sulfide	---	0.002

Metals (ug/L)	acute	chronic
Arsenic	340	---
Arsenic(T)	---	100
Cadmium	TVS	TVS
Chromium III	TVS	TVS
Chromium III(T)	---	100
Chromium VI	TVS	TVS
Copper	TVS	TVS
Iron(T)	---	1000
Lead	TVS	TVS
Manganese	TVS	TVS
Mercury(T)	---	0.01
Molybdenum(T)	---	150
Nickel	TVS	TVS
Selenium	TVS	TVS
Silver	TVS	TVS
Uranium	varies*	varies*
Zinc	TVS	TVS

The quality of Lower Derby Lake has been studied during the remedial actions under Superfund and is known to have received wastewater from the former Shell Chemical Manufacturing Facility. Historic sampling demonstrated that the water column and fish tissues all contained detectable amounts of the organochlorine pesticides aldrin, dieldrin, and endrin and also mercury.

303(d) list Evaluation:

Lake Ladora was listed on the 1998 Colorado Clean Water Act 303(d) Report as Impaired due to aldrin, dieldrin, and mercury. The lake was subsequently removed from the Impaired List to the Monitoring and Evaluation List for the 2002 303(d) Report. Since that time, monitoring has shown the water column concentrations of aldrin and dieldrin have mostly remained below detectable level, but the fish tissues still contain measurable levels of the pesticides.

The lakes and reservoirs located on the Rocky Mountain Arsenal National Wildlife Refuge are a unique segment (COPUS22B). The lakes are not on the current 303(d) List of Impaired Waters and Monitoring and Evaluation List.

This has been validated by reviewing the current regulation (5 CCR 1002-93, effective as of 06/14/2020) (see page 107):
https://www.sos.state.co.us/CCR/GenerateRulePdf.do?ruleVersionId=8787&fileName=5%20CCR%201002-93

This can be further validated by reviewing the Colorado Segmentation mapper. Access the page and click on the lakes located within the boundary of the Refuge. It shows there is no 303(d) impairment. https://cdphe.maps.arcgis.com/apps/Viewer/index.html?appid=f1541d2f21834642ba1551c674fd4a79

Superfund site data for Lower Derby Lake

In 2020, the U.S. Army issued a final Surface Water Monitoring Program Monitoring Completion Report (in permit record). This document provides a summary of water quality samples collected during the CERCLA process. This report summarizes data from the signing of the Record of Decision until completion in 2018. Lake samples are summarized on Table 8 (see page 17) except for 1,4 dioxane results, which are discussed in Section 3.2.2. This can be used as a good reference point for any narrative document. Below is text specific to Lower Derby Lake:

"3.2.1 Lower Derby Lake, Location SW01006

Location SW01006 was selected because it is on the north side of the lake, downstream from South Plants and near the South Tank Farm benzene plume. This location also serves to evaluate potential contamination from exposed surface soil on the South Plants cover. This location was sampled once in fall 2012 and once in spring 2013.

There were no detections of organic contaminants of concern (COCs) in the two samples collected.

Concentrations of inorganic COCs were below the aquatic life standards, except for copper in the FY12 sample. The copper concentration was 45.8 ug/L and the calculated standards are 16.1 ug/L (acute) and 10.5 ug/L (chronic). Aquatic standard calculations are provided in Appendix B. Copper was not previously detected in Lower Derby Lake samples under the SW SAP (FWNEC 2001) and typically has not been detected in wells adjacent to the lakes. Additionally, copper typically was not detected in the Denver Water Department potable water supply to RMA, used to provide supplemental water for the lakes at the time of sampling. The sample collected in FY13 was non-detect."

Further, RMA Manager requested U.S. Army provide the data from any water quality samples obtained from Lower Derby Lake during the past NPDES permit. There are no samples collected in Lower Derby Lake since 2013.

Surface water quality monitoring conducted on Lower Derby Lake under the Superfund program is summarized in Table 3 Below. This information is carried over from the previous permit (2015 Permit). The full set of data is available in the permit record.

Table 3
Surface Water Quality Data Lower Derby Lake RMA

Metals , ug/L	**total (t) or dissolved (d)**	**min**	**Max**	**# of samples**	**Antideg. Value (Bkgd.)[1]**
Silver	t	<4.84	<17.4	20	ND(0)
	d	<4.84	<17.4	10	ND(0)
Aluminum	t	194	3480	20	734
	d	<100	1970	10	N/A
Arsenic	t	<1	7.2	23	1.73
	d	<1.8	6.14	13	5.53

Metals , ug/L	total (t) or dissolved (d)	min	Max	# of samples	Antideg. Value (Bkgd.)[1]
Barium	t	<10	101	19	N/A
	d	12.4	66.8	10	N/A
Beryllium	t	<0.58	0.628	20	2
	d	<0.58	<2	10	N/A
Cadmium	t	<0.68	<8.94	20	N/A
	d	<0.68	<8.94	10	ND(0)
Cobalt	t	<2.02	<25	20	N/A
	d	<2.02	<25	10	N/A
Chromium	t	<3.45	<11.5	20	ND(0)
	d	<3.45	<11.5	10	ND(0)
Copper	t	<6.05	<12.5	20	ND(0)
	d	<6.05	<12.5	10	ND(0)
Iron	t	83	2720	20	556
	d	<100	1720	10	N/A
Mercury	t	<0.1	<0.45	11	ND(0)
Manganese	t	<10	430	20	40 (50%ile)
					122 (85%ile)
	d	3.5	172	10	124
Molybdenum	t	<11.7	13.2	4	ID a/
	d	<11.7	<25	4	N/A
Nickel	t	<3.8	<32.1	20	ND(0)
	d	<3.8	<32.1	10	ND(0)
Lead	t	<1.0	18.8	26	3.1
	d	<1.0	5.2	15	3.4
Antimony	t	<7.24	<30	20	ND(0)
	d	<7.24	<30	10	ND(0)
Selenium	t	<5	5.3	20	ID a/
	d	<5	<90.7	10	ND(0)
Tin	t	<11.1	<11.1	2	ND(0)
	d	<11.1	<11.1	2	ND(0)
Titanium	t	<25	48	2	N/A
	d	<25	<25	2	N/A
Thallium	t	<5	36.5	20	N/A
	d	<5	<85.2	10	ND(0)
Vanadium	t	<4.53	15.5	20	N/A
	d	<4.53	<25	10	N/A
Zinc	t	<6.18	91	20	N/A
	d	6.91	24.4	10	20

a/ Insufficient data to perform statistical analysis. Mo-only 4 data points w/ non-detects, Se- 1/20 detects (5.3 ug/L)

Table 3 (con't)
Surface Water Quality Data Lower Derby Lake RMA

General Chemistry and Nutrients	Total (t) or Dissolved (d)	Minimum	Maximum	# of samples	Antideg. Value (Bkgd.)[1]
Alkalinity mg CaCO3/L	t	38.9	127	19	N/A
Alkalinity - bicarbonate mg CaCO3/L	t	0	146	19	N/A

General Chemistry and Nutrients	Total (t) or Dissolved (d)	Minimum	Maximum	# of samples	Antideg. Value (Bkgd.)[1]
Alkalinity - carbonate mg CaCO3/L	t	0	24	19	N/A
Boron ug/L	t	30.2	132	4	80.9
	d	32.4	99.1	4	N/A
Bromide mg/L	t,d	<2	<2	9	N/A
Specific conductivity (uS/cm)		123	984	19	N/A
Calcium mg/L	t	8.33	77.2	20	N/A
	d	10.8	73.6	10	N/A
Chloride mg/L	t	5.53	211	20	52
	d	13.8	110	10	N/A
Cyanide (ug/L)	t	<5	6.88	5	N/A
Dissolved oxygen mg/L	d	3.5	16.1	19	N/A
Dissolved organic carbon mg/L	d	6.1	29.7	5	N/A
Fluoride mg/L	t	0.2	0.872	25	N/A
	d	0.22	1.12	19	N/A
Potassium mg/L	t	2.86	10.1	20	N/A
	d	<3	8.77	10	N/A
Magnesium mg/L	t	2.43	19.5	20	N/A
	d	3.5	20.1	10	N/A
Sodium mg/L	t	5.29	129	20	N/A
	d	13.9	95.7	10	N/A
Ammonia ug/L	t	<30	789	19	62
	d	<30	49.4	3	N/A
Nitrogen by Kjeldahl Method ug/L	d	332	2300	5	N/A
Nitrite, nitrate - nonspecific ug/L	t	<20	1140	15	N/A
	d	<20	111	2	
Nitrite ug/L	t	<500	<5000	14	N/A
	d	<486	<500	13	N/A
Nitrate ug/L	t	<500	1370	14	1.4
	d	<697	1300	12	1.3
Phosphorous ug/L	t	16.4	376	5	N/A
	d	22.1	24.3	2	N/A
pH as tested in the field, s.u.	N/A	7.06	9.89	19	N/A
Phosphate ug/L	t	<5000		1	N/A
	d	<5000	<5000	7	N/A
Orthophosphate ug/L	t	<5000	<5000	13	N/A
	d	<10	<5000	6	N/A
Sulfate mg/L	t	7.87	165	13	N/A
	d	11.4	160	9	N/A
Temperature as tested in the field, Degrees Celsius	N/A	14.6	25.8	18	N/A
Total organic carbon mg/L	t	5.3	32.2	20	N/A
	d	6.07	10.3	5	N/A
Total phosphates ug/L	t	40.2	553	15	N/A

General Chemistry and Nutrients	Total (t) or Dissolved (d)	Minimum	Maximum	# of samples	Antideg. Value (Bkgd.)[1]
	d	151	314	2	N/A
Phosphorus, dissolved (as P) ug/L	d	12.1	135	3	N/A

1. 50%ile for metals with total recoverable (tr) criterion, 85%ile for metals with dissolved (d) criterion.

Table 3 (con't)
Surface Water Quality Data Lower Derby Lake RMA

Volatile Organics and Pesticides, ug/L	min	max	# of samples
1,1,1-Trichloroethane	<0.2	<0.78	14
1,1-Dichloroethylene / 1,1-Dichloroethene	<0.7	<1.7	7
1,1-Dichloroethane	<0.2	<0.7	7
1,2-Dichloroethenes / 1,2-Dichloroethylenes (cis and trans isomers)	<0.76	<0.76	2
1,2-Dichlorobenzene	<0.2	<0.2	5
1,2-Dichloroethane	<0.2	<1.1	7
1,2-Dichloropropane	<0.2	<0.2	5
1,2-Dimethylbenzene / o-Xylene	<0.2	<0.2	5
1,3-Dichlorobenzene	<0.2	<0.2	5
1,3-Dimethylbenzene / m-Xylene	<1.32	<1.32	2
1,4-Dichlorobenzene	<0.2	<0.23	5
Alpha-Benzene hexachloride / Alpha-Hexachlorocyclohexane	<0.024	<0.038	5
Acetone	<50.8	<76.7	5
Alpha-Chlordane	<0.0124	<0.0287	23
Acrylonitrile	<4.81	<4.81	4
Alpha-endosulfan / Endosulfan I	<0.023	<0.0343	21
Aldrin	<0.025	<0.0918	23
Atrazine	<0.346	<0.512	5
Beta-Benzene hexachloride / Beta-Hexachlorocyclohexane	<0.024	<0.027	5
Bicyclo[2,2,1]hepta-2,5-diene	<0.2	<5	8
Beta-Endosulfan / Endosulfan II	<0.023	<0.04	5
Bromodichloromethane	<0.2	<0.206	5
Benzothiazole	<0.64	<0.64	3
cis-1,2-Dichloroethene / cis-1,2-Dichloroethylene	<0.2	<0.22	5
cis-1,3-Dichloropropylene / cis-1,3-Dichloropropene	<0.2	<0.39	5
Chloroethane	<0.23	<5.23	12
Benzene	<0.2	<1.05	7
Dichlorodifluoromethane	<3.02	<5.02	4
Trichlorofluoromethane	<0.33	<0.873	5
Carbon tetrachloride	<0.25	<0.99	7
Methylene chloride / Dichloromethane	<3.28	<7.4	7
Bromoform	<0.673	<4.95	5
Chloromethane / Methyl chloride	<0.97	<1.96	5

Volatile Organics and Pesticides, ug/L	**min**	**max**	**# of samples**
Bromoform	<0.239	<0.26	5
Chloroform	<0.2	<0.5	7
Hexachlorocyclopentadiene	<0.032	<0.08	22
Chloroacetic acid	<10	<50	6
Chlorobenzene / Monochlorobenzene	<0.2	<0.82	7
p-Chlorophenylmethyl sulfide	<0.64	<0.64	3
p-Chlorophenylmethyl sulfoxide	<0.79	<0.79	3
p-Chlorophenylmethyl sulfone	<0.81	<0.81	3
Carbon disulfide	<0.96	<1.43	5
Dibromochloropropane / Nemagon	<0.15	<0.885	10
Delta-Benzene hexachloride / Delta-Hexachlorocyclohexane	<0.021	<0.029	5
Dibromochloromethane / Chlorodibromomethane	<0.2	<0.2	5
Dicyclopentadiene	<0.2	<2.71	8
Vapona / Dicholorphos / Phosphoric acid 2,2-dichloroethenyl dimethyl ester	<0.25	<0.634	5
Diisopropyl methylphosphonate	<0.2	<1	6
Dithiane	<1.3	<1.3	3
Dieldrin	<0.024	0.0377	23
Dimethyl disulfide	<0.4	<0.92	4
Dimethyl methylphosphate	<0.2	<1	5
Endrin	<0.024	<0.073	23
Endrin aldehyde	<0.0179	<0.076	21
Endrin ketone	<0.016	0.0269	21
Endosulfan sulfate	<0.038	<0.079	5
Ethylbenzene	<0.2	<1.37	7
Fluoroacetic acid	<22.4	<50	6
Gamma-Chlordane	<0.012	<0.075	23
Heptachlor / 1H-1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene	<0.0106	0.0151	23
Heptachlor epoxide	<0.024	<0.0478	23
Isopropyl methylphosphonic acid / Isopropyl methylphosphonate	<13.2	<50	6
Isodrin	<0.0245	<0.056	23
Lindane / Gama-Benzene hexachloride / Gamma-Hexachlorocyclohexane	<0.021	<0.051	7
Toluene	<0.2	<1.47	7
Methyl ethyl ketone / 2-Butanone	<2.34	<8.25	5
Methoxychlor / 1,1'-(2,2,2-Trichloroethylidene)-bis[4-methoxybenzene]	<0.0129	<0.077	21
Methyl isobutyl ketone / Isopropylacetone / 4-Methyl-2-pentanone	<2.06	<8.94	8
Malathion	<0.206	<0.25	5
Methyl-n-butyl ketone / 2-Hexanone	<3	<3.66	5
Methylphosphonic acid / Methylphosphonate	<50		1
1,4-Oxathiane	<1.4	<1.4	3
1,1-Dichloro-2,2-bis(p-chlorophenyl)ethane / Rhothane / TDE / ppDDD	<0.023	<0.0389	21
2,2-Bis(p-chlorophenyl)-1,1-dichloroethene	<0.024	<0.0369	23
2,2-Bis(p-chlorophenyl)-1,1,1-trichloroethane	<0.0276	<0.055	23

Volatile Organics and Pesticides, ug/L	**min**	**max**	**# of samples**
Parathion / Phosphorothioic acid O,O-diethyl O-(4-nitrophenyl) ester / DNTP	<0.226	<0.25	5
Styrene / Ethenylbenzene / Stryol / Styrolene / Cinnamene / Cinnamol	<0.2	<0.2	5
Supona / 2-Chloro-1-(2,4-dichlorophenyl)vinyl diethyl phosphate	<0.25	<0.427	5
trans-1,2-Dichloroethene / trans-1,2-Dichloroethylene	<0.33	<1.07	5
trans-1,3-Dichloropropene	<0.2	<0.206	5
1,1,2,2-Tetrachloroethane / Tetrachloroethane / Acetylene tetrachloride	<0.2	<0.815	5
Tetrachloroethylene / Tetrachloroethene	<0.2	<0.75	7
Trichloroethylene / Trichloroethene / Ethinyl trichloride / Tri-Clene	<0.202	<0.56	7
Toxaphene / Chlorinated camphene / Camphechlor / Alltox / Genephene / Motox	<1.35	<5.62	5
Xylenes	<0.4	<1.36	7

Discharge Characteristics and Application Summary

The RMA Permit expired on March 31, 2020. EPA received the renewal NPDES permit application on August 10, 2020 from the U.S. Fish and Wildlife Service to request the discharge of treated municipal wastewater from Denver Water into Lower Derby Lake on the Refuge. In November 2012 during the previous permit term, EPA received additional supplemental information on the chemical characteristics of the discharge including the last 5 years of analytical testing information from Denver Water. The entire data set is available in the permit record as an electronic file.

A subset of the pollutants analyzed for in the Denver Water Recycled Water Plant Data which have applicable water quality standards set by the Colorado Water Quality Control Commission for Segment 22b are presented below. Included in the table also are aldrin and dieldrin which were pollutants on the 1998 303(d) list for Lake Ladora and phosphorous which may be included as a segment criterion in future rulemaking for the Upper South Platte River Basin Regulation No. 38.

Denver Water Recycled Water Plant Data

Pollutant, ug/L	min	max	# of samples
Aldrin	<0.01	<0.1	8
Aluminum	20	175	38
Ammonia as N, mg/L	<0.008	0.6	45
Arsenic	<0.1	<0.1	46
Boron	180	290	46
Cadmium	<0.1	<0.5	46
Chloride, mg/L	79.3	140	59
Chlorine (total), mg/L	1.5	4	NA
Chromium 6+	<0.05	0.068	2
Chromium (total)	<1	2	46
Copper	6	11	46
Cyanide	<0.02	0.027	15
Dieldrin	<0.01	<0.2	8
Fecal Coliform, #/100mL	<1	<1	N/A
Iron, mg/L	<0.05	0.08	46
Lead	<1	<1	41
Manganese	<2	82	46
Mercury	<0.1	<0.1	46

Pollutant, ug/L	min	max	# of samples
Molybdenum	3	11	46
Nickel	2	5	46
Nitrate as N, mg/L	10	21	15
Nitrite as N, mg/L	<0.01	0.03	19
Nonylphenol	<0.5	<0.5	4
Phosphorous, Total as P	30	400	45
Selenium	1	3	46
Silver	<0.1	<0.5	46
Zinc	18	43	46

The following table summarizes the pollutants of concern (POCs) identified by EPA during the evaluation of the Denver Water Recycled Water Plant data. POCs were identified as pollutants present above the reporting levels in the Denver Water Recycled Water Plant water and having applicable water quality standards and/or criteria established by the Colorado Water Quality Control Commission for Segment 22b of the Upper South Platte River Basin.

POCs are further evaluated for reasonable potential to cause or contribute to an excursion of the applicable water quality standard. In accordance with EPA's NPDES permitting regulations under 40 CFR Part 122.44(d), permit limits must be included for all pollutants having reasonable potential (RP).

Table 4
Denver Water Recycled Water Plant Pollutants of Concern (POC)

Pollutant, ug/L	min	max	# of samples	Max. Proj Effl. Conc.) a/
Aldrin	<0.01	<0.1	8	N/A
Aluminum	20	99 (175) b/	37 (38) b/	100
Ammonia as N, mg/L	<0.008	0.6	45	0.63
Boron	180	290	46	290
Chloride	79.3	140	59	140
Chlorine (total), mg/L	1.5	4	NA	>4
Chromium 6+	<0.05	0.068	2	1.9
Chromium (total)	<1	2	46	2
Copper	6	11	46	11
Cyanide, total	<0.02	0.027	15	c/
Dieldrin	<0.01	<0.2	8	N/A
Fecal Coliform, #/100mL	<1	<1	N/A	N/A
Iron, mg/L	<0.05	0.08	46	0.081
Manganese	<2	82	46	92
Mercury	<0.1	<0.1	46	d/
Molybdenum	3	11	46	11
Nickel	2	5	46	5.1
Nitrate as N, mg/L	10	21	15	25
Nitrite as N, mg/L	<0.01	0.03	19	e/
Phosphorous, Total as P	30	400	45	430
Selenium	1	3	46	3.1
Zinc	18	43	46	44

a/ These values are the projected maximum effluent values at the 95th percentile (95%ile) and 95% confidence interval (95% c.i.).

b/ Maximum reported value is an outlier (Rosner's). Removed from data set for POC analysis.
c/ Only 1/15 samples above reporting limit. Analysis was for total cyanide not weak acid dissociable (WAD) cyanide.
d/ Mercury monitoring was not done at low levels.
e/ Only 2/19 samples above reporting limit.

4. Water Quality Considerations

The following tables list the calculated Table Value Standards for hardness dependent criteria and the non-hardness dependent criteria for Lower Derby Lake:

Table 5
Water Quality Criteria Lower Derby Lake

Table Value Standards for Hardness Dependent Metal POC (at Hardness of 150 mg/L)		
	In-Stream Water Quality Standards	
Metal	Acute Standard	Chronic Standard
Aluminum, trec, ug/L	5960	851
Chromium III, d, ug/L	794	103
Copper, d, ug/L	20	13
Manganese, d, ug/L	3417	1888
Nickel, d, ug/L	660	73
Zinc, d, ug/L	231	175

Water Quality Criterion for Other POC		
Pollutant	Acute Standard	Chronic Standard
Ammonia as N, t, mg/L	22	2.74
Boron, trec, ug/L*	N/A	750
Chloride, mg/L	N/A	250
Chlorine, Total Residual, ug/L	19	11
Chromium VI, d, ug/L	16	11
Cyanide-Free, mg/L	0.005	N/A
Iron, trec, ug/L	N/A	1000
Mercury, t, ug/L	N/A	0.01
Molybdenum, t, ug/L*	N/A	150
Nitrate, t, mg/L*	100	N/A
Nitrite, t, mg/L	N/A	0.5
Selenium, d, ug/L	18.4	4.6

* Based on Agriculture Use Classification

Colorado's water quality criteria for ammonia are the same as those of EPA found in "1999 Update of Ambient Water Quality Criteria for Ammonia", EPA-822-R-99-014, December 1999. The ammonia criteria were derived using an estimated receiving water pH of 7.1 (85%ile of Denver Recycled Water Plant Water Data) and the maximum observed Lower Derby Lake temperature of 25.8^0C.

5. Antidegradation Analysis

The antidegradation analysis is carried over from the previous permit (2015 Permit). This analysis is still valid for this permit term. An antidegradation analysis is required due to the reviewable status of the receiving water and it discharges to waters of the State of Colorado. Surface water data for Lower Derby Lake was evaluated and background pollutant concentrations were established for the period of 1997-2001. Colorado's baseline water quality for antidegradation was established as existing quality as of September 30, 2000. Since the majority of the RMA surface water for Lower Derby Lake was collected during the years surrounding this date and adding additional data collected in 2001 provides data that is within the range of data collected during 2000, all of the data was used to establish baseline water quality in accordance with Colorado's Antidegradation Significance Determination for New or Increased Water Quality Impacts Procedural Guidance Version 1.0 December 2001 (https://documents.deq.utah.gov/legacy/programs/water-quality/standards-technical-services/docs/2010/01Jan/CO_ADGuidance.pdf).

Significance Test

All pollutants identified in the previous permit in the discharge which have corresponding applicable water quality criterion meet the significance threshold.

Table Value Standards (TVS), Baseline Available Increment and Antidegradation Based Average Concentration

The following Table contains the Table Value Standards (TVS), Baseline Water Quality (BWQ), Baseline Available Increment (BAI), Significant Threshold Concentration (SCT), and Antidegradation Based Average Concentration (ADBAC) calculations for Lower Derby Lake Surface Water Data presented above:

Table 6
Antidegradation Values for Lower Derby Lake

Pollutant	Table Value Standard (TVS) [1]or Criterion (WQS)	Baseline Water Quality (BWQ)	Baseline Available Increment (BAI)=WQS-BWQ	Significant Concentration Threshold (SCT)=15%*BAI+BWQ	Antidegradation Based Average Concentration (ADBAC)
Aluminum, trec,ug/L	851	734	117	752	752
Boron, trec, ug/L	750	81	669	181	181
Chloride, mg/L	250	52	198	82	82
Chlorine, Total Residual, ug/L	11	0	11	1.7	1.7
Chromium 6+, d, ug/L	11	1.6	9.4	3.0	3.0
Chromium 3+, d, ug/L	103	0	103	15	15
Copper, d, ug/L	13	0	13	2.0	2.0
Iron, trec, mg/L	1000	556	444	623	623
Manganese, d, ug/L	1888	122 (85%ile)	1766	387	387
Manganese, trec, ug/L	200	40 (50%ile)	160	64	64

Pollutant	Table Value Standard (TVS) [1]or Criterion (WQS)	Baseline Water Quality (BWQ)	Baseline Available Increment (BAI)=WQS-BWQ	Significant Concentration Threshold (SCT)=15%*BAI+BWQ	Antidegradation Based Average Concentration (ADBAC)
Mercury, total, ug/L	0.01	0	0.01	0.0015	0.0015
Molybdenum, d, ug/L	300	0 (Insuf. Data)	300	45	45
Nickel, d, ug/L	72	0	72	11	11
Nitrate, trec, mg/L	100	1.4	99	16	16
Selenium, d, ug/L	4.6	0	4.6	0.7	0.7
Zinc, d, ug/L	175	20	155	43	43

[1] The Lower Derby Lake TVS were calculated using an estimated hardness of 150 mg/L as $CaCO_3$ based on Denver Recycled Water Plant Water Data.

Ammonia Antidegradation Calculations

The Lower Derby ambient water quality data for ammonia consisted of 19 total samples collected from 1997 -2001 of which 15 were for ammonia and 4 were for ammonia nitrogen. For this Permit, it was assumed all samples were reported as ammonia as N or ammonia nitrogen. The correction for ammonia to ammonia as N does not have a significant impact on the determination of the BAI, SCT, or ADBAC for ammonia N. The data set was used to establish the BWQ for Lower Derby Lake as of September 30, 2000 for use in establishing antidegradation based requirements.

There was insufficient data to use for modeling ammonia nitrogen using AMMTOX to establish the ambient TVS for ammonia nitrogen so alternatively TVS used by the Colorado Water Quality Control Division for general permit COG-0058900 were used to estimate ambient TVS for Lower Derby Lake. BAI, SCT and ADBAC values were calculated using these TVS and the BWQ established from the ambient data set.

Table 7
Ammonia- N Antidegradation Values (ug/L) for Lower Derby Lake

Month	Chronic TVS[1]	Acute TVS[1]	BWQ[2]	BAI	SCT	ADBAC
January	5100	13000	62	5040	820	820
February	4700	11000	62	4640	760	760
March	3200	7300	62	3140	530	530
April	1900	6100	62	1840	340	340
May	2400	7900	62	2340	410	410
June	3000	10000	62	2940	500	500
July	2300	9700	62	2240	400	400
August	1900	7900	62	1840	340	340
September	2300	8700	62	2240	400	400
October	3400	11000	62	3340	560	560
November	3700	11000	62	3640	610	610
December	3700	8900	62	3640	610	610

[1] Values from COG-0058900 Table 6d Monthly Chronic Ammonia WQBEL for Warm Water Classified Streams and Table 6e Monthly Acute Total Ammonia WQBEL for Warm Water Classified Streams.

[2] Value is 50%ile of ambient water quality data from 1997-2001. The TVS used in the BWQ calculation for Ammonia N in Lower Derby Lake was determined using the 85%ile of pH data (7.1 s.u.) from the Denver Recycled Water Plant Data and the maximum recorded ambient temperature (25.8 ^{0}C) from the Lower Derby Lake Water Quality Data 1999-2001 directly in the formula for the criterion.

E. Coli Antidegradation Calculations

There is no ambient data and only four samples from previous permit available for *E.coli* so a similar approach as was used for ammonia nitrogen antidegradation calculations to establish ADBAC values for *E.coli*. The ADBAC value of 20/100 mL is used for this permit and comes from Table 4d of COG-0058900.

Antidegradation Alternatives Analysis

The USFWS has completed a Necessity of Degradation and Alternatives Analysis in accordance with the Colorado's Antidegradation Significance Determination for New or Increased Water Quality Impacts Procedural Guidance Version 1.0 December 2001 and requested EPA consider antidegradation alternative values other than ADBAC values to establish some antidegradation based effluent limitations for the Permit. The USFWS asked for alternatives for chloride, boron, copper, ammonia-N, nitrate, and selenium.

For these pollutants, antidegradation alternative values will be based on historic facility performance (Denver Recycled Water Plant Water Data). ADBAC values are based on a two year rolling average while the average and 95th percentile values are based on 5 years of quarterly performance data. The antidegradation alternative monthly average values will be set at the 95th percentile of the facility performance data. The following table contains Antidegradation Alternative values that will be applied in place of ADBAC values for purposes of evaluating water quality based effluent limitations for the discharge.

Table 8
Antidegradation Alternative Values

Pollutant	5-yr Average Performance (Denver Recycled Water Plant Water)	ADBAC	Antidegradation Alternative Value (95th%ile)
Ammonia-N, ug/L	430	340	500
Boron, mg/L	237	181	263
Chloride, mg/L	106	82	120
Copper, ug/L	8.5	2	10
Nitrate, mg/L	15	16	20
Selenium, ug/L	2.1	0.7	3.0

Reasonable Potential Analysis

EPA performs a Reasonable Potential Analysis to determine whether effluent limits for the pollutants of concern are required. The analysis consists of determining a high confidence, high percentile value of the effluent data and comparing the value with the applicable Colorado Water Quality Criterion and the ADBAC or Antidegradation Alternative values determined through the antidegradation analysis. EPA uses a statistical procedure consistent with its 1991 Technical Support Document for Water Quality Based Toxics Control EPA/505/2-90-001 and for this analysis, the projected maximum effluent value is the upper 95th confidence of the 95%ile. The following table shows the summarized results of the Reasonable Potential Analysis done for this discharge:

Table 9
Reasonable Potential Evaluation for Water Quality Based Effluent Limitations

Effluent Pollutant		Effluent 95%ile, 95% c.i.	WQS	ADBAC	RP for WQS	RP for ADBAC
Aluminum, trec, ug/L	acute	100	5960	N/A	No	N/A
	chronic	100	851	752	No	No
Ammonia-N, ug/L	acute	630	22000	N/A	No	N/A
	chronic	630	1900[2]	600[1]	No	Yes
Boron, trec, ug/L	30-day	290	750	263[1]	No	Yes
Chloride, mg/L	30-day	140	250	120[1]	No	Yes
Chlorine, Total Residual, ug/L	chronic	>4000	11	1.7	Yes	Yes
Chromium 6+, d, ug/L	acute	1.9	16	N/A	No	N/A
	chronic	1.9	11	3	No	No
Chromium 3+, d, ug/L	acute	2	794	N/A	No	N/A
	chronic	2	103	15	No	No
Copper, d, ug/L	acute	11	20	N/A	No	N/A
	chronic	11	13	11[1]	No	Yes
Iron, trec, ug/L	chronic	81	1000	623	No	No
Manganese, d, ug/L	acute	92	3417	N/A	No	N/A
	chronic	92	1888	387	No	No
Manganese, trec, ug/L	chronic	92	200	64	No	Yes
Molybdenum, d, ug/L	chronic	11	300	45	No	No
Nickel, d, ug/L	acute	5.1	660	N/A	No	N/A
	chronic	5.1	73	11	No	No
Nitrate, trec, ug/L	chronic	25	100	20[1]	No	Yes
Selenium, d, ug/L	acute	3.1	18.4	N/A	No	N/A

Effluent Pollutant		Effluent 95%ile, 95% c.i.	WQS	ADBAC	RP for WQS	RP for ADBAC
	chronic	3.1	4.6	3.0[1]	No	Yes
Zinc, d, ug/L	acute	44	231	N/A	No	N/A
	chronic	44	175	43	No	Yes

[1] Value is Antidegradation Alternative value
[2] Value is lowest monthly WQS/ADBAC calculated for the year.

Qualitative Reasonable Potential

For bacteria, as stated in the previous permit, the applicable WQS is expressed as *E. coli* and the facility has only provided data for fecal coliform. RMA does perform chlorination and dechlorination however, *E. coli* may be present if disinfection processes are interrupted or stopped. The reported levels of fecal coliform in the discharge (<1 c.f.u./100 mL) are much lower than the applicable WQS and ADBAC and the fecal coliform test included *E. coli* in the reported data, and therefore the potential to exceed the WQS and ADBAC are very low. However, since there is no specific *E. coli* monitoring provided in the permit application, limits for *E. coli* will be placed in the Permit until the facility provides sufficient effluent *E. coli* data to indicate there is no reasonable potential to exceed the WQS and ADBAC. There were only four *E. coli* samples collected during the previous permit term as shown in Table 1a above. In order to conduct a reliable RP analysis, 10 samples are needed. Therefore, the *E. coli* limitations and monitoring requirements will be the same as the previous permit (2015 Permit).

For nutrients nitrogen and phosphorous, data collected for Lower Derby Lake showed measurable amounts of total kjeldahl nitrogen (organic-N plus ammonia) ranging from 332 ug/L to 2300 ug/L, inorganic nitrogen (nitrate) ranging from <0.5 ug/L to 1400 ug/L, and total phosphorous ranging from 16 ug/L to 336 ug/L. The discharge also contains measurable amounts of nutrients, nitrate from 10,000 ug/L to 21,000 ug/L, ammonia N from <8 ug/L to 600 ug/L and total phosphorous from 30 ug/L to 400 ug/L. Although the State of Colorado has not established WQS for nutrients that apply directly to lakes in The South Platte River Basin, Regulation No. 31 sets target concentration values for warm larger lakes (>25 acres) for total nitrogen of 910 ug/L and total phosphorous of 83 ug/L.
There were less than 10 samples collected for total nitrogen and total phosphorous during the previous permit term as shown in Table 1b above. For this Permit, there will be no effluent limits on total nitrogen or total phosphorous. However, monitoring requirements for total kjeldahl nitrogen and total phosphorous will be the same as the previous permit (2015 Permit), so that sufficient future monitoring data exists for RP evaluation in the event WQS for nutrients are established for these lakes.

Reasonable Potential Discussion

For POCs having sufficient data to analyze projected maximum concentrations in the discharge (95%ile, 95%c.i.) greater than the WQS or ADBAC/Antidegradation Alternative values, there is reasonable potential for the discharge to cause or contribute to an excursion of the applicable water quality standard and therefore a limit must be placed in the Permit.

For POCs having sufficient data to analyze projected maximum concentrations in the discharge (95%ile, 95% c.i.) less than the WQS or ADBAC/Antidegradation Alternative values, there is no reasonable

potential for the pollutant to cause or contribute to an excursion of the WQS and effluent limitations are not required.

For POCs with insufficient data (chromium 6+, cyanide, nitrite, mercury) to statistically analyze projected maximum concentrations, monitoring will be required to obtain sufficient data to analyze for reasonable potential and the Permittee may request reduced monitoring requirements once the data shows there is no reasonable potential. EPA would prefer to have at least 10 valid data points to perform an analysis of the projected maximum concentrations. From the previous permit, there are about six data points as shown in table 1b. This permit will continue the same monitoring requirements for these pollutants.

For Total Residual Chlorine (TRC), there are only two data points as shown in table 1a from the previous permit term (2015 Permit). The results are very high (maybe this is due to unit conversion error in the DMR). This Permit will contain the same effluent limitations for both acute and chronic TRC to ensure dechlorination is effective at removing TRC from the discharge at Outfall 001.

Some of the POCs evaluated for Alternative Antidegradation values have maximum projected concentrations that exceed the values (Boron, Chloride, Copper, Nitrate-N, Ammonia-N, Selenium). For some, average data is below the threshold (Boron, Chloride, Nitrate) and for others, average data equal the values (Ammonia-N, Copper, Selenium). Since all of these pollutants have reasonable potential to exceed the water quality standard (Antidegradation Alternative value), the Permit will contain effluent limitations for these pollutants. The Permit limitations will be set equal to the Alternative Antidegradation values and will be expressed in the Permit as 2-yr rolling averages.

Some of the POCs in the discharge have occurred at projected maximum concentrations that are very close to or exceed the ADBAC values but average data is below the threshold (Manganese, Zinc). These POCs have reasonable potential to exceed the ADBAC and limitations will be placed in the Permit. Limits for these pollutants will be set equal to the ADBAC values and will be expressed in the Permit as 2-yr. rolling averages.

Although the Antidegradation based limitations are effective immediately, compliance with the limitations will be first calculated and reported starting 2 years from the effective date of the final permit, and monthly thereafter as a rolling average.

For some POCs there was insufficient data available (Chromium 6+, Cyanide, Mercury, Nitrite) in the discharge to adequately estimate reasonable potential. For these pollutants, effluent limits (ADBELs) will not be in the Permit however additional monitoring will be required to collect sufficient data to assess reasonable potential for these pollutants in any future permit action. From the previous permit, there are less than 10 data points for each of the POC as shown in table 1b. This Permit will continue the same monitoring requirements for these pollutants.

The Colorado Water Quality Control Division (WQCD) also requires WQBELs in the Permit for 30-day averages and daily maximums for all pollutants for which ADBELs/Antidegradation Alternative Limitations are required. 30-day average and daily maximum effluent limits are for ammonia nitrogen, boron, chloride, copper, manganese, selenium, zinc where appropriate.

Since no mercury data is available on either the surface water data or discharge data which is at a method detection limit or practical quantitation level close to either the WQS or ADBAC values, monitoring for mercury using clean sampling and analytical techniques will be required in the permit.

Technology Based Effluent Limitation Evaluation

There are no applicable Federal Effluent Limitations Guidelines and Standards under 40 CFR for this type of discharge.

Colorado's Effluent Limitations under Regulation 62 will apply to this discharge for pollutants expected to be present at levels approaching the levels in the regulation.

Table 10
Technology Based Effluent Standards Colorado Regulation No. 62

Pollutant	30-day avg.	7-day avg.	Daily Maximum
Biological Oxygen Demand (BOD_5), mg/L	30	45	N/A
Carbonaceous Biological Oxygen Demand ($CBOD_5$), mg/L	25	40	N/A
Total Suspended Solids (TSS), mg/L	30	45	N/A
pH, s.u.	N/A	N/A	6-9 (min.- max.)
Residual Chlorine (TRC), mg/L	N/A	N/A	0.5
Oil and Grease, mg/L	N/A	N/A	10

Of the pollutants listed, only Biological Oxygen Demand (BOD_5) and Carbonaceous Biological Oxygen Demand ($CBOD_5$) are not expected to be present at levels close to the regulation levels.

When the above potential Technology Based Effluent Limits (TBELs) are compared with WQBELs, the WQBELs for TRC and pH are more stringent and will be placed in the Permit as a final limit.

6. Effluent Limitations

Table 11
Effluent Limitations for Outfall 001

Effluent Characteristic	Effluent Limitations a/			Basis c/
	30-Day Average	Daily Maximum	2-yr Rolling Average b/	
Total Suspended Solids , mg/L	30	45	N/A	CR#62
E. coli, no./100 mL	126	252	20	WQS
Ammonia as N, ug/L	--	--	--	--
January	5100	13000	600	WQS/ADALT
February	4700	11000	600	WQS/ADALT
March	3200	7300	600	WQS/ADALT
April	1900	6100	600	WQS/ADALT

May	2400	7900	600	WQS/ADALT
June	3000	10000	600	WQS/ADALT
July	2300	9700	600	WQS/ADALT
August	1900	7900	600	WQS/ADALT
September	2300	8700	600	WQS/ADALT
October	3400	11000	600	WQS/ADALT
November	3700	11000	600	WQS/ADALT
December	3700	8900	600	WQS/ADALT
Boron, trec, ug/L	750	N/A	263	WQS/ADALT
Chloride, mg/L	250	N/A	120	WQS/ADALT
Chlorine, Total Residual, ug/L	11	19	1.7	WQS/ADBAC
Copper, pd, ug/L	13	20	11	WQS/ADALT
Manganese, trec, ug/L	200	3417	64	WQS/ADBAC
Nitrate, total, mg/L	100	N/A	20	WQS/ADALT
Selenium, pd, ug/L	4.6	18.4	3.0	WQS/ADALT
Zinc, pd, ug/L	175	231	43	WQS/ADBAC
The pH of the discharge shall not be less than 6.5 or greater than 9.0 at any time.				WQS
The concentration of oil and grease in any single sample shall not exceed 10 mg/L or shall there be any visible sheen in the receiving water.				CR#62

a/ See Definitions, Part 1.1, for definitions.

b/ 2-Year Rolling Average is first calculated and reported two years from the effective date of the Permit as the average of all samples collected in the previous two years. Thereafter, values are calculated and reported as a rolling average of all samples in the previous two years.

c/ Basis of effluent limitations: CR#62 = Colorado Regulation No. 62 – Regulations for Effluent Limitations; WQS = water quality standards; ADBAC= antidegradation based water quality standard; ADALT= Antidegradation Alternative Value.

7. Self-Monitoring Requirements

The self-monitoring requirements are given in Table 12 below. The table lists the various effluent characteristics to be monitored, the frequency to be monitored, the type of sample to be collected, and for some effluent characteristics, the practical quantitation level (PQL) to be used in the analyses. The PQL values are those used by the Colorado WQCD for permits.

Some additional pollutants including nutrients were added to the monitoring list in order to obtain adequate data to determine if reasonable potential exists for the applicable WQBELs to be exceeded. The data will also be useful in any future permit WQBEL and antidegradation analysis that may be necessary.

Whole Effluent Toxicity (WET) monitoring is required to ensure that narrative standards for toxics (CO Regulation 31) and the provisions of the Colorado Water Quality Control Division's WET Policy (WPC-Permitting-1) are implemented in this Permit.
EPA received only three WET tests passed documentation for Q2-2016, Q1-2017, and Q1-2018. The previous permit required 4 WET tests, if no chronic toxicity was found in the effluent, the Permittee was not required to perform further WET monitoring. The Permittee did not meet the WET monitoring requirements for the previous permit. For this Permit, EPA requires RMA to conduct two annual chronic WET tests when the first two discharges occur (2 years). The facility will be required to perform chronic WET monitoring on an annual basis using two species, *Pimephales promelas* and *ceriodaphnia dubia*. The following minimum dilution series should be used: 0% effluent (control), 20%, 40%, 60%, 80%, and 100% effluent. In the event chronic toxicity is found in the effluent, a Toxicity Identification/Toxicity Reduction Evaluation (TIE/TRE) will be required. If there is no chronic toxicity is found in the 100% effluent concentration in any of the first two tests (2 years), the Permittee is not required to perform further WET monitoring.

Also added is a provision that after either 10 samples or two and one-half (2.5) years of data have been collected, the Permittee may request that the frequency of monitoring for some effluent characteristics be reduced to quarterly or eliminated based on a reasonable potential analysis of the data collected since the Permit was issued. The reasonable potential analysis shall be done using a projected maximum effluent value based on a lognormal distribution at a 95%ile at a 95 percent confidence interval. Based on the information submitted, the Permit issuing authority may make any change in the monitoring frequency, reduce the frequency of monitoring to quarterly or delete the monitoring requirement for that effluent characteristic. This change may be made without going back to public notice.

Continuous monitoring for temperature with a recorder is required in order to obtain adequate data to determine if effluent limitations may be necessary in the future. Once per day monitoring of temperature would not be adequate to determine if effluent limitations are necessary to comply with Colorado Regulation 31, Table I, WQS on temperature. From the previous permit, there are three temperature data points as shown in table 1b. This Permit will continue the same monitoring requirements for temperature. Monitoring for Outfall 001 shall occur at the tap on the RMWP at the Dechlorination Building at 56th Avenue and Uvalda Street, Commerce City, CO.

Table 12
Self-Monitoring Requirements

Effluent Characteristic	Frequency	Sample Type a/	Practical Quantitation Limits e/
Total Flow, mgd b/	Continuous	Recorder	N/A
Temperature, ºC (April-December)	Continuous	Recorder	N/A
Temperature, ºC (January-March)	Continuous	Recorder	N/A
Total Suspended Solids, mg/L	Monthly	Composite	N/A
E Coli, no./100 mL	Monthly f/	Grab	N/A
pH, specific units	Continuous	Recorder	N/A
Oil and grease, visual c/	Daily	Visual c/	N/A

Effluent Characteristic	Frequency	Sample Type a/	Practical Quantitation Limits e/
Total Ammonia as N, mg/L	Monthly	Composite	0.2 mg/L
Hardness, total as $CaCO_3$, mg/L	Monthly	Composite	20 mg/L
Boron, Trec, ug/L	Monthly	Composite	50 ug/L
Chloride, mg/L	Monthly	Composite	0.5 mg/L
Chlorine, Total Residual, ug/L	Continuous d/	Recorder	50 ug/L
Chromium VI, d, ug/L	Monthly f/	Grab	20 ug/L
Copper, PD, ug/L	Monthly	Composite	5 ug/L
Cyanide, WAD, ug/L g/	Monthly f/	Composite	5 ug/L
Manganese, Trec, ug/L	Monthly	Composite	2 ug/L
Mercury, Total, ug/L (Low-level)	Monthly f/	Composite	0.003 ug/L
Nitrate, total, ug/L	Monthly	Composite	50 ug/L
Nitrite, total, ug/L	Monthly f/	Composite	10 ug/L
Kjeldahl Nitrogen, total, ug/L	Quarterly	Composite	500 ug/L
Phosphorous, total, ug/L	Quarterly	Composite	10 ug/L
Selenium, PD, ug/L	Monthly	Composite	1 ug/L
Zinc, PD, ug/L	Monthly	Composite	10 ug/L
Whole Effluent Toxicity (WET), chronic h/	Annual	Composite	1.0 TU_c

a/ See Definitions, Part 1.1, for definition of terms.

b/ Flow measurements of effluent volume shall be made in such a manner that the Permittee can affirmatively demonstrate that representative values are being obtained. The average flow rate (in million gallons per day) during the reporting period and the maximum flow rate observed (in mgd) shall be reported.

c/ A daily visual observation is required. If a visible sheen is detected, a grab sample shall be taken immediately and analyzed in accordance with the requirements of 40 CFR Part 136. The concentration of oil and grease shall not exceed 10 mg/L in any sample.

d/ Monitoring for total residual chlorine only required if the effluent is chlorinated. If not chlorinating during the reporting period, report "Not Chlorinating".

e/ Practical Quantitation Limit (PQL) means the minimum concentration of an analyte (substance) that can be measured with a high degree of confidence that the analyte is present at or above that concentration. The method and procedures used to analyze for an effluent characteristic (e.g., cadmium) shall have a PQL no greater than specified in this table (e.g., PQL for cadmium no greater than 1 ug/L). **For purposes of this Permit, analytical values less than the PQL shall be considered to be zero for purposes of determining averages**. **If all analytical results are less than the PQL, then "less than x", where x is the PQL, shall be reported on the Discharge Monitoring Report form. Otherwise, report the maximum observed value and the calculated average(s).**

f/ After two and one-half (2.5) years or a minimum of ten (10) valid data points have been collected, the Permittee may request that the frequency of monitoring for this effluent characteristic be reduced to quarterly or eliminated based on a reasonable potential analysis of the data collected since the Permit was issued. The reasonable potential analysis shall be done using all of the data collected to calculate a maximum projected effluent value at a 95%ile with a 95 percent confidence interval for a lognormal distribution using EPA Technical Support Document for Water Quality Based Toxics Control EPA/505/2-90-001 March 1991. Based on the information submitted, the Permit issuing authority may make any change in the monitoring frequency, reduce the frequency of monitoring to quarterly or delete the monitoring requirement for that effluent characteristic. This change may be made without going to public notice.

g/ For cyanide, the acute standard is in the form of "free" cyanide concentrations. However, there is no analytical procedure for measuring the concentration of free cyanide in a complex effluent. Therefore, ASTM (American Society for Testing and Materials) analytical procedure D2036-81, Method C, will be used to measure weak acid dissociable cyanide in the effluent. This analytical procedure will detect free cyanide plus those forms of complex cyanide that are most readily converted to free cyanide.

h/ See Part 1.3.2.2 of the Permit for WET monitoring requirements.

8. Endangered Species Act (ESA) Requirements

Section 7(a) of the Endangered Species Act requires federal agencies to ensure that any actions authorized, funded, or carried out by an Agency are not likely to jeopardize the continued existence of any federally-listed endangered or threatened species or adversely modify or destroy critical habitat of such species.

The U. S. Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) website program was utilized to determine what federally listed Endangered, Threatened, Proposed and Candidate Species may occur within the project area. The federally listed threatened and endangered species within the project area are listed in Table 13 below:

Table 13 –Threatened and Endangered Species in IPaC

Species/Critical Habitat	Scientific Name	Status	Determination
Black-footed Ferret	*Mustela nigripes*	Endangered	No effect
Preble's Meadow Jumping Mouse	*Zapus hudsonius preblei*	Threatened	No effect (2013 BO)
Piping plover	*Charadrius melodus*	Threatened	Likely to adversely affect (2013 BO)
Whooping crane	*Grus americana*	Endangered	Likely to adversely affect (2013 BO)
Pallid sturgeon	*Scaphirhynchus albus*	Endangered	Likely to adversely affect (2013 BO)
Ute ladies'-tresses	*Spirathes diuvialis*	Threatened	No effect (2013 BO)
Western prairie fringed orchid	*Platanthera praeclara*	Threatened	May adversely affect but would not likely jeopardize the continued

Species/Critical Habitat	Scientific Name	Status	Determination
			existence (2013 BO)

EPA utilized the information provided by the USFWS IPaC system and the Fish and Wildlife Service final Biological Opinion (BO) in 2013 to identify a determination for each species in the table above. There are no critical habits at this location. It is very unlikely that the minimal discharges from RMA lakes regularly reaches the South Platte River. In addition, EPA had informal consultation phone calls and sent a letter to USFWS to seek concurrence with EPA's determination before public notice of the Permit.

The justification to support the determination for the species are as follows. This is a renewal permit. There will be no expected changes in water quality in the receiving water and no new construction for this facility. Any water discharged will have been treated to applicable water quality standards, criteria, and requirements; therefore, there are no expected changes or impacts to downstream habitats.

In addition, this project has already undergone formal consultation with the Fish and Wildlife Service with a final Programmatic Biological Opinion (PBO) issued in 1996 for the U.S. Army and supplemented with a final Biological Opinion (BO) in 2013 for the Services.

This Permit action will not result in any new construction or change any water quality conditions which may affect any listed or endangered species in a manner not consistent with the issued BOs.

The 2013 Biological Opinion supplement is contained in the Administrative Record for the Permit.

USFWS issued a letter dated December 21, 2021 stating "However, no consultation is necessary for this permit renewal since the activity is covered by and consistent with the effects analysis and incidental take authorized by the 2013 BO and its 2017 Amendment."

9. National Historic Preservation Act (NHPA) Requirements

Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. § 470(f) requires that federal agencies consider the effects of federal undertakings on historic properties. EPA has evaluated its issuance of the NPDES permit for the US Fish and Wildlife Service RMA to assess this action's potential effects on any listed or eligible historic properties or cultural resources. EPA does not anticipate any impacts on listed/eligible historic properties or cultural resources because this Permit is a renewal and will not be associated with any significant ground disturbance or significant changes to the volume or point of discharge. During public notice of the Permit, the State Historic Preservation Office will be notified as an interested party to ensure that historic properties are not negatively affected by the conditions of the Permit.

10. Miscellaneous

The Permit will be issued for a period of approximately 5 years, but not to exceed 5 years, with the Permit effective date and expiration date determined at the time of permit issuance.

Permit drafted by Qian Zhang, P.E., Wastewater Unit, 303-312-6267, June 18, 2021.

ADDENDUM:

PUBLIC NOTICE AND RESPONSE TO COMMENTS

The proposed permit and statement of basis were public noticed on EPA website on January 28, 2022, and the public notice period closed on February 28, 2022. EPA did not receive any comments.

401 Certification:

EPA sent a 401 certification request letter to Colorado on January 26, 2022. As stated in the letter, consistent with 40 CFR § 124.53(c)(3), failure to issue or deny certification within a specified reasonable time, not to exceed 60 days of the receipt of the letter, will be considered by EPA to be a waiver of the certification requirement. It has been more than 60 days since the receipt of the letter, and no certification has been received. As such, the 401 certification is waived.