Texas Commission on Environmental Quality

Remediation Division Correspondence Identification Form

SITE & PROGRAM AREA IDENTIFICATION

SITE LOCATION

Site Name: Union Pacific Railroad Houston Wood Preserving Works

Address 1: 4910 Liberty Road

Address 2:

Houston State: **Texas**

Zip Code: 77026 County: Harris

TCEQ Region: Houston - 12

REMEDIATION DIVISION PROGRAM AND FACILITY IDENTIFICATION

Is This Site Being Managed Under A State Lead Contract? ☐ Yes ☑ No

Program Area: IHW Corrective Action

Mail Code: MC-127 (IHW)

Is This A New Site To This Program Area? ☐ Yes ☑ No

Additional Information: SWR No. 31547

Additional Information: Permit/ Compliance Plan No. 50343

DOCUMENT(S) IDENTIFICATION

PHASE OF REMEDIATION	DOCUMENT NAME
1. Miscellanous	PENTACHLOROPHENOL SOIL ASSESSMENT INTERIM REPORT
2. Please select a phase of remediatic	
3. Please select a phase of remediatic	
4. Please select a phase of remediatic	
5. Please select a phase of remediatic	

CONTACT INFORMATION

☑ I attest that all work has been done in accordance with TCEQ rules ☑ I certify that I am aware misrepresentation of any claim is a violation.

RESPONSIBLE PARTY/APPLICANT/CUSTOMER INFORMATION (IF APPLICABLE)

Union Pacific Railroad

ENVIRONMENTAL CONSULTANT/REPORT PREPARER/AGENT

Golder Associates Inc.

SIGNATURES

DATABASE CODES

Document No.	TCEQ Database Term	Document No.	TCEQ Database Term
1.		4.	
2.		5.	
3.			

March 30, 2020 Project No. 19119232

Ms. Maureen Hatfield
Texas Commission on Environmental Quality
VCP-CA Section, Team 1, Remediation Division, MC-127
P.O. Box 13087
Austin, Texas 78711-3087

PENTACHLOROPHENOL SOIL ASSESSMENT INTERIM REPORT
UNION PACIFIC RAILROAD HOUSTON WOOD PRESERVING WORKS FACILITY
4910 LIBERTY ROAD FACILITY, HOUSTON, TEXAS
POST-CLOSURE CARE PERMIT NO. HW-50343; INDUSTRIAL SWR NO. 31547

Dear Ms. Hatfield,

Golder Associates Inc (Golder) is pleased to provide on behalf of Union Pacific Railroad (UPRR) this Interim Report summarizing the surface soil sampling for pentachlorophenol (PCP) conducted in February 2020 at the UPRR former Houston Wood Preserving Works (HWPW) site (the Site). The additional soil sampling was requested by the Texas Commission on Environmental Quality (TCEQ) during a meeting on June 12, 2019, with additional samples requested in a September 6, 2019 TCEQ letter to UPRR in order to evaluate PCP concentrations in surface soils along the western and northern boundary of the Tie Storage Area (Solid Waste Management Unit (SWMU) No 12) near soil samples previously collected (Figure 1). The soil concentrations for PCP were less than the method detection limits (MDLs) in some of the surface soil samples collected in the northern and western portions of the Site during previous investigations (Phase 2A Report (ERM, 1997), Phase 2B Report, (ERM, 1999)), however, the MDLs were greater than the critical protective concentration level (PCL).

The PCP MDLs for the soil samples detailed in the Phase 2A and 2B Reports (ERM,1997 and 1999, respectively) were previously discussed in the TCEQ comment letter dated August 1, 2005. In response to that letter, UPRR and the TCEQ agreed that a subset of the previous surface soil locations be resampled and analyzed for PCP as detailed in a UPRR letter dated September 5, 2006, email exchanges between UPRR and the TCEQ dated October 12 and 20, 2005 discussing specific resample locations across the Site including the former Tie Storage Area, and in the TCEQ approval letter dated November 29, 2005. The resampled soil samples were collected in 2006. As discussed in the Affected Property Assessment Report (APAR) Addendum (PBW, 2009), the distribution of the resampled surface soil locations collected in 2006 indicated that the PCP MDLs and concentrations within the Tie Storage Area were less than PCP Residential Assessment Levels (RALs). However, to address a potential data gap along the northern and western perimeter of the Tie Storage Area, the TCEQ requested in 2019 that 15 additional soil samples be collected along the northern and western boundary to evaluate PCP concentrations in the surface soils. Details of the field sampling activities and soil data evaluation are provided in the following sections.

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Field Sampling Activities

On February 10 and 11, 2020, Golder advanced 15 soil borings (SSO-01 through SSO-15) to a depth of 2 feet below ground surface (bgs) in the vicinity of the previous surface soil sample locations on the northern and western boundary of the Site, as shown on Figures 1 and 2. Soil samples were collected with a hand auger collected continuously across the two-foot depth interval and field screened using a photoionization detector (PID). Prior to sampling, the PID was calibrated using 100 parts per million (ppm) by volume isobutylene standard. The hand auger was decontaminated before and between each boring. The location for each soil boring was surveyed in the field using a Trimble handheld GPS unit. Table 1 summarizes the soil sample locations, PID readings, and soil descriptions for each location.

Composite soil samples were collected from 0 to 2 feet bgs at each location, placed in laboratory-supplied containers, stored on ice in an insulated cooler, and hand delivered to ALS Environmental in Houston, Texas for PCP analysis by EPA Method 8270. A completed chain-of-custody accompanied the samples through receipt at the analytical laboratory. Copies of the laboratory report and a data usability summary prepared pursuant to TRRP-13 Guidance are included in Attachment 1.

Data Evaluation

PCP concentrations in the soil samples collected in February 2020 are summarized in Table 2. The soil analytical results were compared to TCEQ Texas Risk Reduction Program (TRRP) Tier 1 Residential and Commercial/Industrial (C/I) $^{Tot}Soil_{Comb}$ PCLs (30-acre source area) and Tier 2 $^{GW}Soil_{Ing}$ PCL calculated using site-specific data. Details of the Tier 2 PCL calculation are discussed in Section 11 of the *Affected Property Assessment Report Addendum* dated July 21, 2009 with equations and supporting site-specific documentation in Appendix 9 of the same document (PBW, 2009).

As shown on Table 2 and Figure 2, PCP concentrations in surface soil samples at some locations along the northern and western boundary exceed the Tier 2 $^{GW}Soil_{Ing}$ PCL (0.12 mg/kg). PCP concentrations detected above the Tier 2 $^{GW}Soil_{Ing}$ PCL ranged from 0.13 mg/kg (SSO-04) to 13 mg/kg (SSO-08). To further evaluate the soil-to-groundwater pathway, groundwater sampling results for PCP concentrations from monitoring wells in the uppermost water-bearing zone (A-TZ) across the Site were reviewed. Except for one sample from MW-18A located on the east side of the Site near the former Recent Process Area (see Figure 1), none of the groundwater samples analyzed for PCP from A-TZ wells collected during the 2018 and 2019 groundwater monitoring events have had detected PCP concentrations above the Tier 1 $^{GW}GW_{Ing}$ PCL. PCP was detected in MW-18A during the January 2019 sampling event, which was the first detection in the well since 2002, but was below the detection limit during the July 2019 sampling event. PCP concentrations have been below detection limits since 2012 in monitoring wells MW-12A, MW-13, MW-15A, and MW-38A, which are all located near the northern and western boundaries of the Site. This indicates that even though some surface soil samples collected in this area have PCP concentrations greater than the $^{GW}Soil_{Ing}$ pathway, the concentrations are protective of groundwater per TCEQ Title 30 Chapter 350.75(i)(7)(C) given the length of time since the releases at the Site (prior to 1984 when the facility shut down) and that no concentrations were detected in groundwater recently above the PCL.

Since PCP concentrations in soils are likely protective of groundwater based on long-term groundwater data, PCP concentrations in soils were compared to the $^{Tot}Soil_{Comb}$ PCLs to evaluate the remaining exposure pathway. PCP concentrations from the 15 samples collected in February 2020 are all below the C/I $^{Tot}Soil_{Comb}$ PCL for a 30-acre source area (32 mg/kg). However, since the soil samples were collected near the Site property boundary, the

concentrations were also conservatively compared to the Tier 1 Residential $^{Tot}Soil_{Comb}$ PCL for a 30-acre source area (0.73 mg/kg). PCP concentrations in three samples, SSO-03 (3.7 mg/kg), SSO-07 (3.9 mg/kg (field duplicate of 6.7 mg/kg)), and SSO-08 (13 mg/kg), exceed the Tier 1 Residential $^{Tot}Soil_{Comb}$ PCL. Since PCP concentrations along the boundary of the Site exceeded the Tier 1 Residential $^{Tot}Soil_{Comb}$ PCL, additional delineation is recommended to evaluate PCP concentrations offsite to the north and to the west of the Site boundary. Golder on behalf of UPRR is preparing a work plan detailing the additional soil delineation activities that will be submitted to the TCEQ for review.

If you have any questions or comments, please feel free to give Mr. Kevin Peterburs of UPRR a call at (414) 267-4164 or us at 512-671-3434.

Sincerely,

Golder Associates Inc.

Michelle Hermiston, P.G.
Senior Project Manager

Eric C. Matzner, P.G.
Principal / Practice Leader

Texas Geosciences Firm No. 50369

References

ERM-Southwest, Inc. (ERM), 1997. *Phase 2A Report, RCRA Facility Investigation and Extent of Contamination Investigation, Houston Wood Preserving Works, Houston, Texas*. February

ERM, 1999. *Phase 2B, RCRA Facility Investigation and Extent of Contamination Investigation, Houston Wood Preserving Works, Houston, Texas*. February

Pastor, Behling and Wheeler LLC (PBW), 2009, *Affected Property Assessment Report Addendum and Response to Comments*, Union Pacific Railroad Houston Wood Preserving Works Facility, July 21.

CC: TCEQ Region 12, Houston Texas

Attachments: Table 1 – Surface Soil Sample Locations
Table 2 – Pentachlorophenol Concentrations – Surface Soil Sampling Results
Figure 1 – Surface Soil Sampling Location – Site-Wide – Pentachlorophenol
Figure 2 - Surface Soil Sampling Location – Tie Storage Area – Pentachlorophenol
Attachment 1 – Data Usability Summary and Laboratory Analytical Reports

https://golderassociates.sharepoint.com/sites/116841/project files/6 deliverables/rap/rap revision 5/pcp interim report/uprr hwpw pentachlorophenol surface soil assessment letter report march 2020.docx

Tables

Table 1

Surface Soil Sample Locations - Soil Pentachlorophenol Assessment
UPRR Houston Wood Preserving Works

Sample ID	Sample Interval (ft bgs)	Latitude	Longitude	PID (ppmV)	Soil type
SSO-01	0-2	29.787449	-95.321182	0.1	0-0.5 topsoil; 0.5-2 clay
SSO-02	0-2	29.787543	-95.321721	2.9	0-0.5 topsoil; 0.5-2 clay
SSO-03	0-2	29.787589	-95.322464	0.6	0-2 topsoil
SSO-04	0-2	29.787584	-95.323116	0.1	0-0.5 topsoil; 0.5-2 clay
SSO-05	0-2	29.787492	-95.323864	3.6	0-0.5 topsoil; 0.5-2 clay
SSO-06	0-2	29.787247	-95.323866	1.7	0-0.5 topsoil; 0.5-2 clay
SSO-07	0-2	29.786992	-95.323861	0.9	0-0.5 topsoil; 0.5-2 clay
SSO-08	0-2	29.786795	-95.323857	2.5	0-0.5 topsoil; 0.5-2 clay
SSO-09	0-2	29.786591	-95.323853	2.2	0-0.5 topsoil; 0.5-2 clay
SSO-10	0-2	29.786271	-95.323843	1.8	0-0.5 topsoil; 0.5-2 clay
SSO-11	0-2	29.785992	-95.323796	4.0	0-0.5 sand; 0.5-2 clay
SSO-12	0-2	29.785685	-95.323799	2.3	0-0.5 sand; 0.5-2 clay
SSO-13	0-2	29.785438	-95.323797	1.6	0-2 sand
SSO-14	0-2	29.785342	-95.324344	4.7	0-2 clay
SSO-15	0-2	29.785056	-95.324525	6.0	0-2 clay

Notes:
Soil samples collected on February 10 and 11, 2020

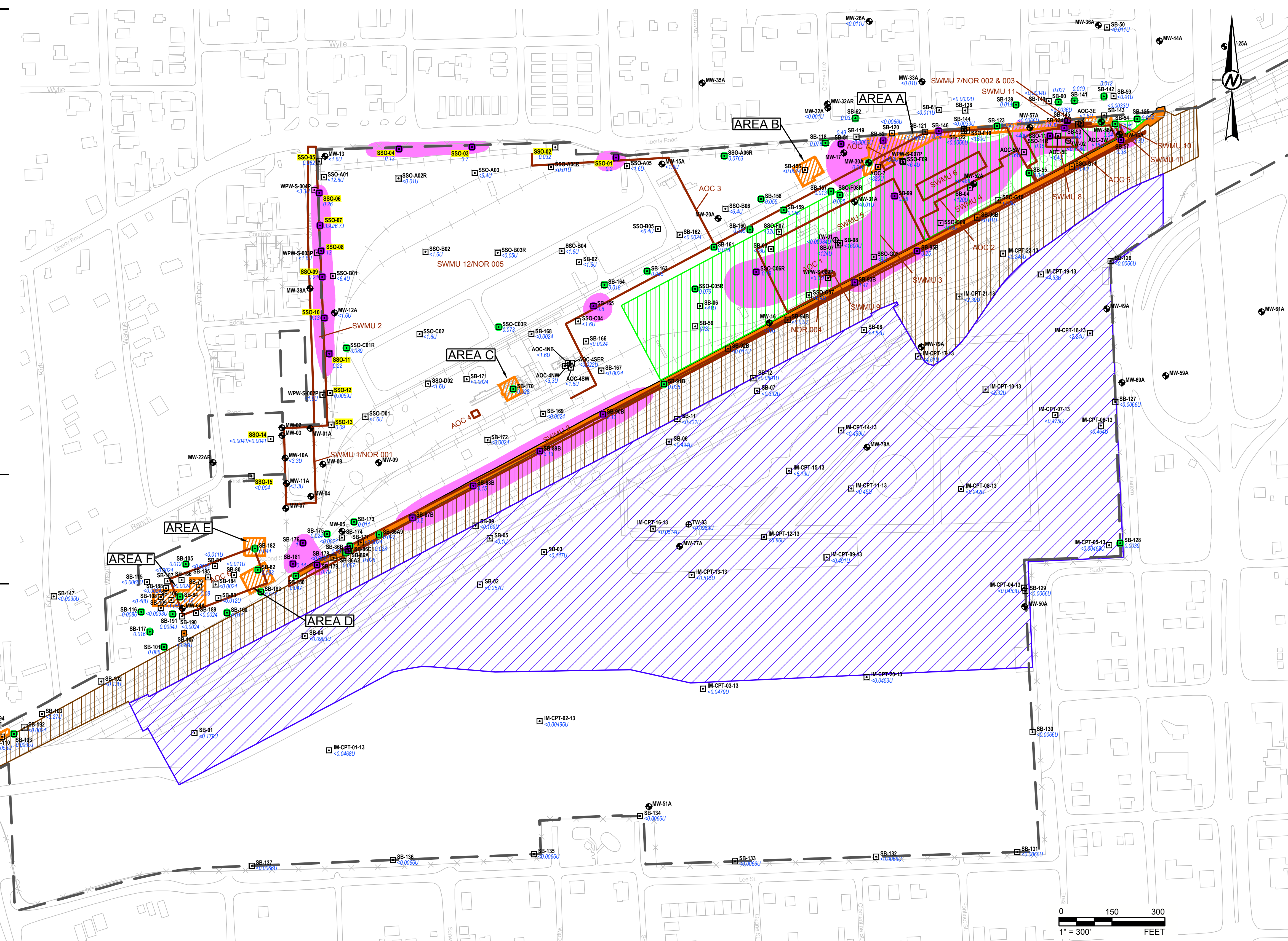
Table 2

Pentachlorophenol Concentrations - Surface Soil Sampling Results
UPRR Houston Wood Preserving Works

Sample ID	Sample Interval	Sample Date	Pentachlorophenol (mg/kg)	
TRRP Tier 2 Residential $^{GW}Soil_{Ing}$ PCL (mg/kg) *			0.12	
TRRP Tier 1 Residential $^{Tot}Soil_{Comb}$ PCL (mg/kg)			0.73	
TRRP Tier 1 C/I $^{Tot}Soil_{Comb}$ PCL (mg/kg)			32	
SSO-01	0-2	02/10/2020	0.2	
SSO-02	0-2	02/11/2020	0.032	
SSO-03	0-2	02/10/2020	3.7	
SSO-04	0-2	02/10/2020	0.13	
SSO-05	0-2	02/11/2020	0.062	
SSO-06	0-2	02/10/2020	0.26	
SSO-07	0-2	02/10/2020	3.9	J
SSO-07 (duplicate)	0-2	02/10/2020	6.7	J
SSO-08	0-2	02/10/2020	13	
SSO-09	0-2	02/10/2020	0.21	
SSO-10	0-2	02/10/2020	0.13	
SSO-11	0-2	02/11/2020	0.22	
SSO-12	0-2	02/11/2020	0.0059	J
SSO-13	0-2	02/11/2020	0.09	
SSO-14	0-2	02/11/2020	< 0.0041	
SSO-14 (duplicate)	0-2	02/11/2020	< 0.0041	
SSO-15	0-2	02/11/2020	< 0.004	

Notes: TRRP 30-acre source area PCLs (30 TAC §350, Tables 1 and 2), last updated November 2019.
* Tier 2 calculations using site-specific data are detailed in Affected Property Assessment Report Addendum dated July 21, 2009.

Figures



LEGEND

- UPRR PROPERTY BOUNDARY
- HISTORICAL STRUCTURE AND FEATURE
- ROAD, PARKING LOT, SIDEWALK
- FENCE
- RAILROAD
- A-TZ MONITORING WELL LOCATION
- TEMPORARY MONITORING WELL LOCATION
- SOIL BORING LOCATION
- 0.078 PENTACHLOROPHENOL CONCENTRATION IN mg/Kg
- (NS) NOT SAMPLED

PCL EVALUATION

- DETECTED SURFACE SOIL CONCENTRATION <RAL
- DETECTED SURFACE SOIL CONCENTRATION >cPCL
- AFFECTED PROPERTY/PCLE ZONE
- SURFACE SOILS EXCAVATED WITHIN AOC AND CONSOLIDATED IN SOIL CAP AREA
- RAILROAD BALLAST CAP AREA
- ASPHALT CAP AREA
- SOIL CAP
- CONCRETE CAP AREA

NOTE(S)

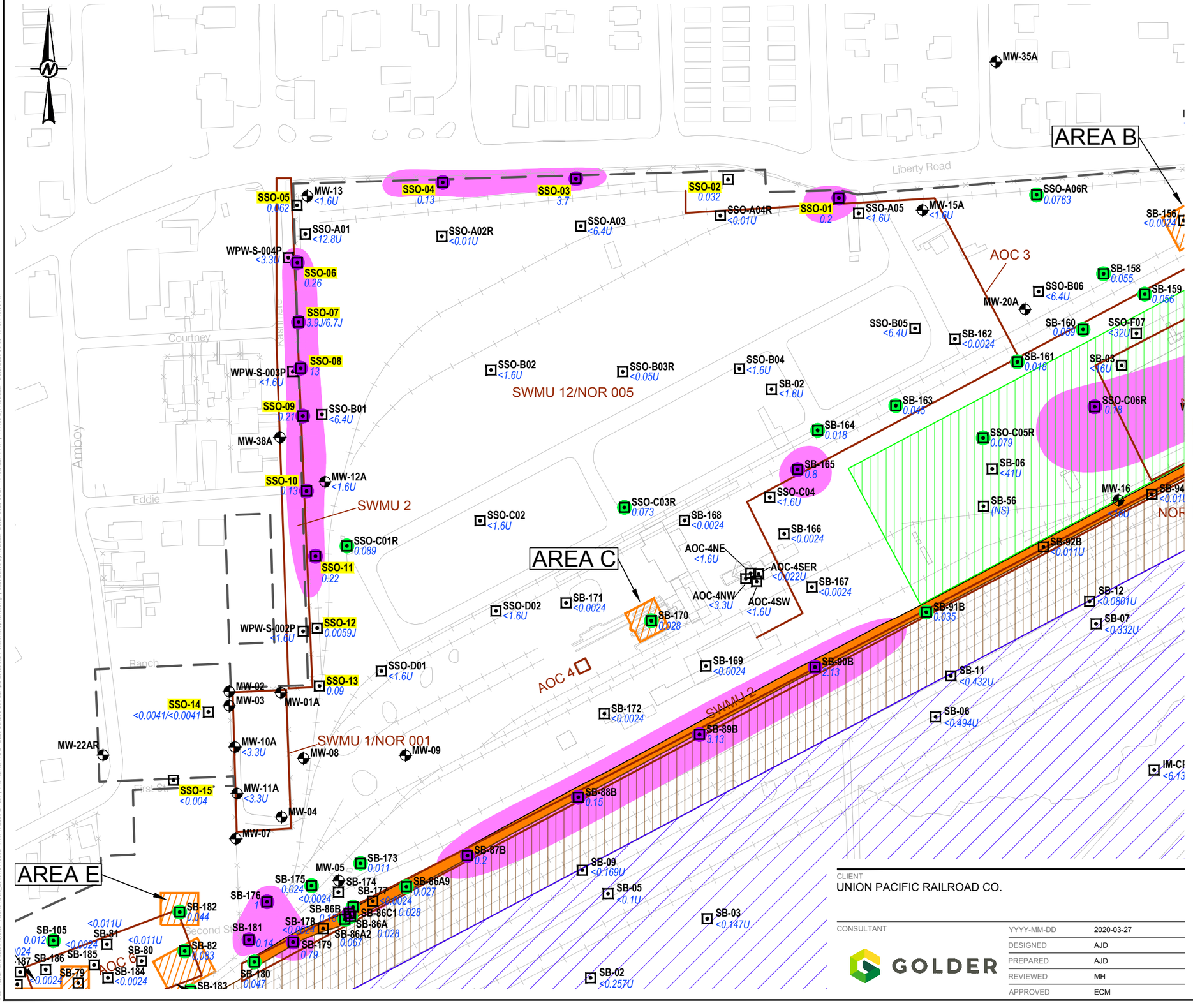
1. J = ESTIMATED CONCENTRATION LESS THAN MDL.
2. U = NOT DETECTED (SQL REPORTED).
3. RESIDENTIAL ASSESSMENT LEVEL (RAL) = 0.12 mg/Kg.
4. CRITICAL PCL (cPCL) = 0.12 mg/Kg (ON-SITE AND OFF-SITE).
5. RAL & cPCL BASED ON TIER 1 & 2 RES/CI PCLs, 30 ACRE SOURCE AREA.
6. R = RESAMPLED LOCATION (2006) (i.e., SSO-C01R).
7. YELLOW HIGHLIGHTED LOCATIONS WERE COLLECTED IN FEBRUARY 2020.

REFERENCE(S)

BASE MAP FROM ERM-SOUTHWEST, INC APAR ADDENDUM, FIG 3-1, DATED JUNE 2004.

CLIENT	UNION PACIFIC RAILROAD CO.
PROJECT	HOUSTON WOOD PRESERVING WORKS
CONSULTANT	GOLDER
YYYY-MM-DD	2020-03-27
DESIGNED	AJD
PREPARED	AJD
REVIEWED	MH
APPROVED	ECM
TITLE	SURFACE SOIL SAMPLE LOCATION - SITE WIDE - PENTACHLOROPHENOL
PROJECT NO.	19119232
REV.	0
FIGURE	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND

- UPRR PROPERTY BOUNDARY
- HISTORICAL STRUCTURE AND FEATURE
- ROAD, PARKING LOT, SIDEWALK
- FENCE
- RAILROAD
- A-TZ MONITORING WELL LOCATION
- TEMPORARY MONITORING WELL LOCATION
- SOIL BORING LOCATION
- 0.078 PENTACHLOROPHENOL CONCENTRATION IN mg/Kg
- (NS) NOT SAMPLED

PCL EVALUATION

- DETECTED SURFACE SOIL CONCENTRATION <RAL
- DETECTED SURFACE SOIL CONCENTRATION >cPCL
- AFFECTED PROPERTY/PCLE ZONE
- SURFACE SOILS EXCAVATED WITHIN AOC AND CONSOLIDATED IN SOIL CAP AREA
- RAILROAD BALLAST CAP AREA
- ASPHALT CAP AREA
- SOIL CAP
- CONCRETE CAP AREA

NOTE(S)

1. J = ESTIMATED CONCENTRATION LESS THAN MDL.
2. U = NOT DETECTED (SQL REPORTED).
3. RESIDENTIAL ASSESSMENT LEVEL (RAL) = 0.12 mg/Kg.
4. CRITICAL PCL (cPCL) = 0.12 mg/Kg (ON-SITE AND OFF-SITE).
5. RAL & cPCL BASED ON TIER 1 & 2 RES/CI PCLs, 30 ACRE SOURCE AREA.
6. R = RESAMPLED LOCATION (2006) (i.e., SSO-C01R).
7. YELLOW HIGHLIGHTED LOCATIONS WERE COLLECTED IN FEBRUARY 2020.

REFERENCE(S)

BASE MAP FROM ERM-SOUTHWEST, INC APAR ADDENDUM, FIG 3-1, DATED JUNE 2004.

0 75 150
1" = 150' FEET

CLIENT
UNION PACIFIC RAILROAD CO.

CONSULTANT
GOLDER

YYYY-MM-DD	2020-03-27
DESIGNED	AJD
PREPARED	AJD
REVIEWED	MH
APPROVED	ECM

PROJECT
HOUSTON WOOD PRESERVING WORKS

TITLE
SURFACE SOIL SAMPLE LOCATION - TIE STORAGE AREA - PENTACHLOROPHENOL

PROJECT NO.	REV.	FIGURE
19119232	0	2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

Path: \\toarkana\data\Projects - Round Rock_2019\19119232 - HWPW\2020-2 Feb\ | File Name: FIG 2 - 2020 Surface Soil Sample Locations-Pentachlorophenol.dwg | Last Edited By: rsalazar Date: 2020-03-27 Time:5:22:41 PM | Printed By: RSalazar Date: 2020-03-30 Time:1:43:50 PM

ATTACHMENT 1

Data Usability Summary and Laboratory Analytical Report

Memorandum

February 27, 2020
Revised February 28, 2020

To:	Eric Matzner	Ref. No.:	11183954-1620
From:	Angela Bown/cs/550-NF	Tel:	513-285-1102
CC:	Jesse Orth; Jon Lang; Julie Lidstone; Chris Knight		

Subject: **Data Usability Summary**
Pentachlorophenol Assessment in Soils
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
February 2020

1. Scope of Data Usability Study

This document details a Data Usability Summary (DUS) of analytical results for soil samples collected in support of the Pentachlorophenol Assessment in Soils at the Union Pacific Railroad (UPRR)/Houston TX-Wood Preserving Works site during February 2020. Samples were submitted to ALS Environmental (ALS), located in Houston, Texas and are reported in data package HS20020447. The intended use of the data is to support the Pentachlorophenol Assessments in Soils investigation at the site by providing current concentrations of the chemical of concern.

Data were reviewed and validated by Angela Bown of GHD, in accordance with Title 30 of the Texas Administrative Code Section 350.54 (30 TAC 350.54) as described in the Texas Commission on Environmental Quality (TCEQ) Regulatory Guidance document entitled "Review and Reporting of COC Concentration Data under TRRP", (RG-366/TRRP-13), revised May 2010, herein referred to as "TRRP-13 Guidance". Evaluation of the data was based on information obtained from the chain of custody form, the finished report forms, method blank data, recovery data from surrogate spikes/laboratory control samples (LCS)/matrix spikes (MS), duplicate data, field quality assurance/quality control (QA/QC) samples, the laboratory review checklists (LRC), and the laboratory exception reports (ER).

A sample collection and analysis summary is presented in Table 1. This summary provides a cross-reference of field sample identification numbers and location identification. Each sample is assigned a unique field identification number.

The validated sample results are presented in Table 2. A summary of the analytical methodology is presented in Table 3.

2. Laboratory Qualifications

The Laboratory's quality assurance program is consistent with the quality standards outlined in the National Environmental Laboratory Accreditation Program (NELAP). This laboratory was accredited under Texas Certification number # TX104704231 at the time the analysis was performed and the certificate is included in Attachment A.

3. Project Objectives

3.1 Sampling/Analytical QA/QC Objectives

The QA/QC program was designed to identify contamination resulting from the sampling, sample transport and analytical process through the analysis of trip blank samples, field blank samples, field duplicate sample sets, and method blanks. The QA/QC program was designed to evaluate the quality of the resulting data with respect to bias and precision through analysis of LCS, MS, and duplicate analyses.

4. Data Review/Validation Results

4.1 Sample Holding Time and Preservation

Samples were shipped with a chain of custody and the paper work was filled out properly.

All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

The sample chain of custody document and the analytical report were used to determine sample holding times. All samples were prepared and analyzed within the required holding times.

4.2 Sample Containers

Sample containers used were certified pre-cleaned glass and plastic containers provided by the laboratory. These containers meet or exceed analyte specifications established in the United States Environmental Protection Agency (USEPA) *Specifications and Guidance for Contaminant-free Sample Containers*.

4.3 Calibrations

According to the LRC, initial calibration and continuing calibration data met the criteria for the selected method.

4.4 Laboratory Method Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures. As these were not discrete samples handled in the field, these blanks are not listed on the sample identification cross-reference list found in the data packages.

For this study, laboratory method blanks were analyzed at a minimum frequency of one per twenty investigative samples and/or one per analytical batch and results are reported in the laboratory data packages.

The method blank result was non-detect or below the method quantitation limit (MQL), indicating that laboratory contamination was not a factor for this investigation.

4.5 Internal Standard and Surrogate Spike Recoveries

Recoveries of internal standards are addressed in the LRC of the data packages. All internal standard recoveries associated with the compounds of interest were acceptable per the LRC.

In accordance with the methods employed, all samples, blanks, and QC samples analyzed for semi-volatile organic compounds (SVOCs) are spiked with surrogate compounds prior to sample analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices. The recovery ranges established by the laboratory are adopted as the acceptance criteria for the project. Each individual surrogate compound is expected to meet the laboratory control limits. According to the TRRP-13 Guidelines, one outlying surrogate is acceptable for methods with multiple surrogate spike compounds as long as the recovery is at least ten percent. Sample analyzed at elevated sample dilutions (five times or greater) were not assessed.

Surrogate recoveries were assessed against laboratory control limits and/or the guidance in TRRP-13. All surrogate recoveries met the above criteria.

4.6 Laboratory Control Sample Analysis

LCSs are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects. The recovery ranges established by the laboratory are adopted as the acceptance criteria for the project.

For this study, LCSs were analyzed at a minimum frequency of one per twenty investigative samples and/or one per analytical batch.

The LCS contained the analyte specified in the method. All LCS recoveries were within the laboratory control limits, demonstrating acceptable analytical accuracy.

4.7 Matrix Spike Analysis

To evaluate the effects of sample matrices on the preparation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with known concentrations of the analytes of interest and analyzed as MS/matrix spike duplicate (MSD) samples. The RPD between the MS and MSD is used to assess analytical precision.

No site-specific samples were selected for MS/MSD analyses. The laboratory performed MS/MSD on non-site samples. These cannot be used to assess accuracy and precision for the site samples.

4.8 Field QA/QC Samples

The field QA/QC consisted of two field duplicate sample sets.

Field Duplicate Sample Analysis

To assess the analytical and sampling protocol precision, two field duplicate sample sets were collected and submitted "blind" to the laboratory, as specified in Table 1. The RPDs associated with these duplicate samples must be less than 50 percent for soil samples. The RPDs are only used when sample concentrations are above the estimated regions of detection.

Field duplicate summary data are presented in Table 2. The results for sample set SO-1620-SSO07(0-2)-20200210 and SO-1620-FD01-20200210 displayed variability in pentachlorophenol results. Table 4 presents the qualified sample results.

4.9 Field Procedures

Golder Associates, Inc. collected soil samples in accordance with their Standard Operating Procedures (SOP) for sample collection.

4.10 Analyte Reporting

The laboratory reported detected results for each analyte down to the sample detection limit (SDL), which is defined as the method detection limit (MDL) with sample-specific adjustments for dilutions, aliquot size, volumes, etc. Positive analyte detections less than the MQL but greater than the SDL were qualified as estimated (J) in Table 2 unless qualified otherwise in this memorandum.

The detectability check standard (DCS) results supported the laboratory MDLs.

5. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are usable for the purpose of supporting the Pentachlorophenol Assessment in Soils investigation at the site by providing current concentrations of the chemical of concern with the specific qualifications noted herein.

Table 1

Sample Collection and Analysis Summary
Pentachlorophenol Assessment in Soils
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
February 2020

Sample Identification	Location	Matrix	Start Depth (ft bgs)	End Depth (ft bgs)	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameters: Pentachlorophenol	Comments
SO-1620-SSO01(0-2)-20200210	SSO01	Soil	0	2	02/10/2020	13:10	X	
SO-1620-SSO03(0-2)-20200210	SSO03	Soil	0	2	02/10/2020	13:40	X	
SO-1620-SSO04(0-2)-20200210	SSO04	Soil	0	2	02/10/2020	13:50	X	
SO-1620-SSO06(0-2)-20200210	SSO06	Soil	0	2	02/10/2020	14:00	X	
SO-1620-SSO07(0-2)-20200210	SSO07	Soil	0	2	02/10/2020	14:10	X	
SO-1620-SSO08(0-2)-20200210	SSO08	Soil	0	2	02/10/2020	14:20	X	
SO-1620-SSO09(0-2)-20200210	SSO09	Soil	0	2	02/10/2020	14:30	X	
SO-1620-SSO10(0-2)-20200210	SSO10	Soil	0	2	02/10/2020	14:45	X	
SO-1620-SSO05(0-2)-20200211	SSO05	Soil	0	2	02/11/2020	09:25	X	
SO-1620-SSO11(0-2)-20200211	SSO11	Soil	0	2	02/11/2020	09:40	X	
SO-1620-SSO12(0-2)-20200211	SSO12	Soil	0	2	02/11/2020	09:45	X	
SO-1620-SSO13(0-2)-20200211	SSO13	Soil	0	2	02/11/2020	09:50	X	
SO-1620-SSO14(0-2)-20200211	SSO14	Soil	0	2	02/11/2020	10:00	X	
SO-1620-SSO15(0-2)-20200211	SSO15	Soil	0	2	02/11/2020	10:19	X	
SO-1620-SSO02(0-2)-20200211	SSO02	Soil	0	2	02/11/2020	11:00	X	
SO-1620-FD01-20200210	SSO07	Soil	0	2	02/10/2020	-	X	FD(SO-1620-SSO07(0-2)-20200210)
SO-1620-FD02-20200211	SSO14	Soil	0	2	02/11/2020	-	X	FD(SO-1620-SSO14(0-2)-20200211)

Notes:

FD - Field Duplicate of Sample in Parentheses
"-" - Not Applicable
ft bgs - Feet below ground surface

Table 2

Analytical Results Summary
Pentachlorophenol Assessment in Soils
Union Pacific Railroad (UPRR/Houston, TX-Wood Preserving Works
Houston, Texas
February 2020

Location ID:		**SSO01**	**SSO02**	**SSO03**
Sample Name:		**SO-1620-SSO01(0-2)-20200210**	**SO-1620-SSO02(0-2)-20200211**	**SO-1620-SSO03(0-2)-20200210**
Sample Date:		**02/10/2020**	**02/11/2020**	**02/10/2020**
Depth:		**0-2 ft BGS**	**0-2 ft BGS**	**0-2 ft BGS**
Parameters	**Unit**			
Semivolatile Organic Compounds				
Pentachlorophenol	mg/kg	0.20	0.032	3.7
General Chemistry				
Moisture	wt%	13.4	14.9	10.9

Notes:

J - Estimated concentration

Table 2

Analytical Results Summary
Pentachlorophenol Assessment in Soils
Union Pacific Railroad (UPRR/Houston, TX-Wood Preserving Works
Houston, Texas
February 2020

Location ID:		**SSO04**	**SSO05**	**SSO06**
Sample Name:		**SO-1620-SSO04(0-2)-20200210**	**SO-1620-SSO05(0-2)-20200211**	**SO-1620-SSO06(0-2)-20200210**
Sample Date:		**02/10/2020**	**02/11/2020**	**02/10/2020**
Depth:		**0-2 ft BGS**	**0-2 ft BGS**	**0-2 ft BGS**
Parameters	**Unit**			
Semivolatile Organic Compounds				
Pentachlorophenol	mg/kg	0.13	0.062	0.26
General Chemistry				
Moisture	wt%	8.75	14.8	15.6

Notes:

J - Estimated concentration

Table 2

Analytical Results Summary
Pentachlorophenol Assessment in Soils
Union Pacific Railroad (UPRR/Houston, TX-Wood Preserving Works
Houston, Texas
February 2020

Location ID:		**SSO07**	**SSO07**	**SSO08**
Sample Name:		**SO-1620-SSO07(0-2)-20200210**	**SO-1620-FD01-20200210**	**SO-1620-SSO08(0-2)-20200210**
Sample Date:		**02/10/2020**	**02/10/2020**	**02/10/2020**
Depth:		**0-2 ft BGS**	**0-2 ft BGS**	**0-2 ft BGS**
			Duplicate	
Parameters	**Unit**			
Semivolatile Organic Compounds				
Pentachlorophenol	mg/kg	6.7 J	3.9 J	13
General Chemistry				
Moisture	wt%	15.7	22.2	16.9

Notes:

J - Estimated concentration

Table 2

Analytical Results Summary
Pentachlorophenol Assessment in Soils
Union Pacific Railroad (UPRR/Houston, TX-Wood Preserving Works
Houston, Texas
February 2020

Location ID:		**SSO09**	**SSO10**	**SSO11**
Sample Name:		**SO-1620-SSO09(0-2)-20200210**	**SO-1620-SSO10(0-2)-20200210**	**SO-1620-SSO11(0-2)-20200211**
Sample Date:		**02/10/2020**	**02/10/2020**	**02/11/2020**
Depth:		**0-2 ft BGS**	**0-2 ft BGS**	**0-2 ft BGS**
Parameters	**Unit**			
Semivolatile Organic Compounds				
Pentachlorophenol	mg/kg	0.21	0.13	0.22
General Chemistry				
Moisture	wt%	18.9	17.4	7.94

Notes:

J - Estimated concentration

Table 2

Analytical Results Summary
Pentachlorophenol Assessment in Soils
Union Pacific Railroad (UPRR/Houston, TX-Wood Preserving Works
Houston, Texas
February 2020

Location ID:		**SSO12**	**SSO13**	**SSO14**
Sample Name:		**SO-1620-SSO12(0-2)-20200211**	**SO-1620-SSO13(0-2)-20200211**	**SO-1620-SSO14(0-2)-20200211**
Sample Date:		**02/11/2020**	**02/11/2020**	**02/11/2020**
Depth:		**0-2 ft BGS**	**0-2 ft BGS**	**0-2 ft BGS**
Parameters	**Unit**			
Semivolatile Organic Compounds				
Pentachlorophenol	mg/kg	0.0059 J	0.090	<0.0041
General Chemistry				
Moisture	wt%	14.7	8.83	19.4

Notes:

J - Estimated concentration

Table 2

Analytical Results Summary
Pentachlorophenol Assessment in Soils
Union Pacific Railroad (UPRR/Houston, TX-Wood Preserving Works
Houston, Texas
February 2020

Location ID:		**SSO14**	**SSO15**
Sample Name:		**SO-1620-FD02-20200211**	**SO-1620-SSO15(0-2)-20200211**
Sample Date:		**02/11/2020**	**02/11/2020**
Depth:		**0-2 ft BGS**	**0-2 ft BGS**
		Duplicate	
Parameters	**Unit**		
Semivolatile Organic Compounds			
Pentachlorophenol	mg/kg	<0.0041	<0.0040
General Chemistry			
Moisture	wt%	20.7	18.2

Notes:

J - Estimated concentration

Table 3

Analytical Methods
Pentachlorophenol Assessment in Soils
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
February 2020

Parameter	Method	Matrix	Holding Time	
			Collection to Extraction (Days)	Extraction to Analysis (Days)
Pentachlorophenol	SW-846 8270D	Soil	14	40

Method References:

SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, 1986, with subsequent revisions

Table 4

Qualified Sample Data Due to Variability in Field Duplicate Results
Pentachlorophenol Assessment in Soils
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
February 2020

Parameter	Analyte	RPD	Sample ID	Qualified Result	Field Duplicate Sample ID	Qualified Result	Units
SVOCs	Pentachlorophenol	53	SO-1620-SSO07(0-2)-20200210	6.7 J	SO-1620-FD01-20200210	3.9 J	mg/Kg

Notes:

RPD - Relative Percent Difference
SVOCs - Semi-volatile Organic Compounds
J - Estimated concentration

Attachment A
Laboratory NELAP Certificate

Texas Commission on Environmental Quality

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Matrix: ***Drinking Water***

Method EPA 1613

Analyte	AB	Analyte ID	Method ID
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10120408

Method EPA 200.8

Analyte	AB	Analyte ID	Method ID
Copper	TX	1055	10014605
Lead	TX	1075	10014605

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Matrix: ***Non-Potable Water***

Method EPA 1010

Analyte	AB	Analyte ID	Method ID
Ignitability	TX	1780	10116606

Method EPA 120.1

Analyte	AB	Analyte ID	Method ID
Conductivity	TX	1610	10006403

Method EPA 1311

Analyte	AB	Analyte ID	Method ID
TCLP	TX	849	10118806

Method EPA 1312

Analyte	AB	Analyte ID	Method ID
SPLP	TX	850	10119003

Method EPA 160.4

Analyte	AB	Analyte ID	Method ID
Residue-volatile	TX	1970	10010409

Method EPA 1613

Analyte	AB	Analyte ID	Method ID
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	TX	9516	10120408
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	TX	9519	10120408
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	TX	9420	10120408
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	TX	9426	10120408
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	TX	9423	10120408
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	TX	9471	10120408
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	TX	9453	10120408
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	TX	9474	10120408
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-HxCDD)	TX	9456	10120408
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	TX	9477	10120408
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	TX	9459	10120408
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	TX	9543	10120408
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	TX	9540	10120408
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	TX	9480	10120408

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Matrix: ***Non-Potable Water***

2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF	TX	9549	10120408
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	TX	9612	10120408
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10120408
Total Heptachlorodibenzofuran (Total HpCDF)	TX	9444	10120408
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	TX	9438	10120408
Total Hexachlorodibenzofuran (Total HxCDF)	TX	9483	10120408
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	TX	9468	10120408
Total Pentachlorodibenzofuran (Total PeCDF)	TX	9552	10120408
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	TX	9555	10120408
Total Tetrachlorodibenzofuran (Total TCDF)	TX	9615	10120408
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	TX	9609	10120408

Method EPA 1664

Analyte	**AB**	**Analyte ID**	**Method ID**
n-Hexane Extractable Material (HEM) (O&G)	TX	1803	10127807

Method EPA 180.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Turbidity	TX	2055	10011606

Method EPA 200.8

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	TX	1000	10014605
Antimony	TX	1005	10014605
Arsenic	TX	1010	10014605
Barium	TX	1015	10014605
Beryllium	TX	1020	10014605
Boron	TX	1025	10014605
Cadmium	TX	1030	10014605
Calcium	TX	1035	10014605
Chromium	TX	1040	10014605
Cobalt	TX	1050	10014605
Copper	TX	1055	10014605
Iron	TX	1070	10014605

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Matrix: ***Non-Potable Water***

Lead	TX	1075	10014605
Magnesium	TX	1085	10014605
Manganese	TX	1090	10014605
Molybdenum	TX	1100	10014605
Nickel	TX	1105	10014605
Potassium	TX	1125	10014605
Selenium	TX	1140	10014605
Silver	TX	1150	10014605
Sodium	TX	1155	10014605
Strontium	TX	1160	10014605
Thallium	TX	1165	10014605
Tin	TX	1175	10014605
Titanium	TX	1180	10014605
Uranium	TX	3035	10014605
Vanadium	TX	1185	10014605
Zinc	TX	1190	10014605

Method EPA 245.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10036609

Method EPA 300.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10053200
Chloride	TX	1575	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrate-nitrite	TX	1820	10053200
Nitrite as N	TX	1840	10053200
Orthophosphate as P	TX	1870	10053200
Sulfate	TX	2000	10053200

Method EPA 325.1

Analyte	**AB**	**Analyte ID**	**Method ID**

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Matrix: ***Non-Potable Water***

Chloride	TX	1575	10056801

Method EPA 335.1

Analyte	AB	Analyte ID	Method ID
Amenable cyanide	TX	1510	10060001

Method EPA 335.2

Analyte	AB	Analyte ID	Method ID
Total cyanide	TX	1645	10278203

Method EPA 335.4

Analyte	AB	Analyte ID	Method ID
Total cyanide	TX	1645	10061402

Method EPA 350.3

Analyte	AB	Analyte ID	Method ID
Ammonia as N	TX	1515	10064401

Method EPA 365.3

Analyte	AB	Analyte ID	Method ID
Orthophosphate as P	TX	1870	10070801
Phosphorus	TX	1910	10070801

Method EPA 375.4

Analyte	AB	Analyte ID	Method ID
Sulfate	TX	2000	10073800

Method EPA 376.1

Analyte	AB	Analyte ID	Method ID
Sulfide	TX	2005	10074201

Method EPA 410.4

Analyte	AB	Analyte ID	Method ID
Chemical oxygen demand (COD)	TX	1565	10077404

Method EPA 415.1

Analyte	AB	Analyte ID	Method ID
Total Organic Carbon (TOC)	TX	2040	10078407

Method EPA 420.1

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10079400

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Matrix: ***Non-Potable Water***

Method EPA 420.4

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10080203

Method EPA 6020

Analyte	AB	Analyte ID	Method ID
Aluminum	TX	1000	10156419
Antimony	TX	1005	10156419
Arsenic	TX	1010	10156419
Barium	TX	1015	10156419
Beryllium	TX	1020	10156419
Boron	TX	1025	10156419
Cadmium	TX	1030	10156419
Calcium	TX	1035	10156419
Chromium	TX	1040	10156419
Cobalt	TX	1050	10156419
Copper	TX	1055	10156419
Iron	TX	1070	10156419
Lead	TX	1075	10156419
Lithium	TX	1080	10156419
Magnesium	TX	1085	10156419
Manganese	TX	1090	10156419
Molybdenum	TX	1100	10156419
Nickel	TX	1105	10156419
Potassium	TX	1125	10156419
Selenium	TX	1140	10156419
Silver	TX	1150	10156419
Sodium	TX	1155	10156419
Strontium	TX	1160	10156419
Thallium	TX	1165	10156419
Tin	TX	1175	10156419
Titanium	TX	1180	10156419

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Matrix: ***Non-Potable Water***

Vanadium	TX	1185	10156419
Zinc	TX	1190	10156419

Method EPA 608

Analyte	AB	Analyte ID	Method ID
4,4'-DDD	TX	7355	10103603
4,4'-DDE	TX	7360	10103603
4,4'-DDT	TX	7365	10103603
Aldrin	TX	7025	10103603
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10103603
alpha-Chlordane	TX	7240	10103603
Aroclor-1016 (PCB-1016)	TX	8880	10103603
Aroclor-1221 (PCB-1221)	TX	8885	10103603
Aroclor-1232 (PCB-1232)	TX	8890	10103603
Aroclor-1242 (PCB-1242)	TX	8895	10103603
Aroclor-1248 (PCB-1248)	TX	8900	10103603
Aroclor-1254 (PCB-1254)	TX	8905	10103603
Aroclor-1260 (PCB-1260)	TX	8910	10103603
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10103603
Chlordane (tech.)	TX	7250	10103603
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10103603
Dieldrin	TX	7470	10103603
Endosulfan I	TX	7510	10103603
Endosulfan II	TX	7515	10103603
Endosulfan sulfate	TX	7520	10103603
Endrin	TX	7540	10103603
Endrin aldehyde	TX	7530	10103603
Endrin ketone	TX	7535	10103603
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10103603
gamma-Chlordane	TX	7245	10103603
Heptachlor	TX	7685	10103603

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Matrix: ***Non-Potable Water***

Heptachlor epoxide	TX	7690	10103603
Methoxychlor	TX	7810	10103603
Toxaphene (Chlorinated camphene)	TX	8250	10103603

Method EPA 624

Analyte	AB	Analyte ID	Method ID
1,1,1-Trichloroethane	TX	5160	10107207
1,1,2,2-Tetrachloroethane	TX	5110	10107207
1,1,2-Trichloroethane	TX	5165	10107207
1,1-Dichloroethane	TX	4630	10107207
1,1-Dichloroethylene	TX	4640	10107207
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10107207
1,2-Dichlorobenzene	TX	4610	10107207
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10107207
1,2-Dichloropropane	TX	4655	10107207
1,3-Dichlorobenzene	TX	4615	10107207
1,4-Dichlorobenzene	TX	4620	10107207
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10107207
2-Chloroethyl vinyl ether	TX	4500	10107207
Acetone (2-Propanone)	TX	4315	10107207
Acrolein (Propenal)	TX	4325	10107207
Acrylonitrile	TX	4340	10107207
Benzene	TX	4375	10107207
Bromodichloromethane	TX	4395	10107207
Bromoform	TX	4400	10107207
Carbon tetrachloride	TX	4455	10107207
Chlorobenzene	TX	4475	10107207
Chlorodibromomethane	TX	4575	10107207
Chloroethane (Ethyl chloride)	TX	4485	10107207
Chloroform	TX	4505	10107207
cis-1,2-Dichloroethylene	TX	4645	10107207

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Matrix: ***Non-Potable Water***

cis-1,3-Dichloropropene	TX	4680	10107207
Ethylbenzene	TX	4765	10107207
m+p-xylene	TX	5240	10107207
Methyl bromide (Bromomethane)	TX	4950	10107207
Methyl chloride (Chloromethane)	TX	4960	10107207
Methyl tert-butyl ether (MTBE)	TX	5000	10107207
Methylene chloride (Dichloromethane)	TX	4975	10107207
Naphthalene	TX	5005	10107207
o-Xylene	TX	5250	10107207
Tetrachloroethylene (Perchloroethylene)	TX	5115	10107207
Toluene	TX	5140	10107207
trans-1,2-Dichloroethylene	TX	4700	10107207
trans-1,3-Dichloropropylene	TX	4685	10107207
Trichloroethene (Trichloroethylene)	TX	5170	10107207
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10107207
Vinyl chloride	TX	5235	10107207
Xylene (total)	TX	5260	10107207

Method EPA 625

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	TX	6715	10107401
1,2,4-Trichlorobenzene	TX	5155	10107401
1,2-Dichlorobenzene	TX	4610	10107401
1,2-Diphenylhydrazine	TX	6220	10107401
1,3-Dichlorobenzene	TX	4615	10107401
1,4-Dichlorobenzene	TX	4620	10107401
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10107401
2,4,5-Trichlorophenol	TX	6835	10107401
2,4,6-Trichlorophenol	TX	6840	10107401
2,4-Dichlorophenol	TX	6000	10107401
2,4-Dimethylphenol	TX	6130	10107401

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Matrix: ***Non-Potable Water***

2,4-Dinitrophenol	TX	6175	10107401
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10107401
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10107401
2-Chloronaphthalene	TX	5795	10107401
2-Chlorophenol	TX	5800	10107401
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10107401
2-Methylphenol (o-Cresol)	TX	6400	10107401
2-Nitrophenol	TX	6490	10107401
3,3'-Dichlorobenzidine	TX	5945	10107401
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10107401
4-Chloro-3-methylphenol	TX	5700	10107401
4-Chlorophenyl phenylether	TX	5825	10107401
4-Methylphenol (p-Cresol)	TX	6410	10107401
4-Nitrophenol	TX	6500	10107401
Acenaphthene	TX	5500	10107401
Acenaphthylene	TX	5505	10107401
Anthracene	TX	5555	10107401
Benzidine	TX	5595	10107401
Benzo(a)anthracene	TX	5575	10107401
Benzo(a)pyrene	TX	5580	10107401
Benzo(b)fluoranthene	TX	5585	10107401
Benzo(g,h,i)perylene	TX	5590	10107401
Benzo(k)fluoranthene	TX	5600	10107401
bis(2-Chloroethoxy)methane	TX	5760	10107401
bis(2-Chloroethyl) ether	TX	5765	10107401
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10107401
Butyl benzyl phthalate	TX	5670	10107401
Chrysene	TX	5855	10107401
Dibenz(a,h) anthracene	TX	5895	10107401
Diethyl phthalate	TX	6070	10107401

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Issue Date: 5/1/2019

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Matrix: ***Non-Potable Water***

Dimethyl phthalate	TX	6135	10107401
Di-n-butyl phthalate	TX	5925	10107401
Di-n-octyl phthalate	TX	6200	10107401
Fluoranthene	TX	6265	10107401
Fluorene	TX	6270	10107401
Hexachlorobenzene	TX	6275	10107401
Hexachlorobutadiene	TX	4835	10107401
Hexachlorocyclopentadiene	TX	6285	10107401
Hexachloroethane	TX	4840	10107401
Indeno(1,2,3-cd) pyrene	TX	6315	10107401
Isophorone	TX	6320	10107401
Naphthalene	TX	5005	10107401
Nitrobenzene	TX	5015	10107401
n-Nitrosodiethylamine	TX	6525	10107401
n-Nitrosodimethylamine	TX	6530	10107401
n-Nitrosodi-n-butylamine	TX	5025	10107401
n-Nitrosodi-n-propylamine	TX	6545	10107401
n-Nitrosodiphenylamine	TX	6535	10107401
Pentachlorobenzene	TX	6590	10107401
Pentachlorophenol	TX	6605	10107401
Phenanthrene	TX	6615	10107401
Phenol	TX	6625	10107401
Pyrene	TX	6665	10107401
Pyridine	TX	5095	10107401

Method EPA 7196

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	TX	1045	10162206

Method EPA 7470

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10165603

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Matrix: ***Non-Potable Water***

Method EPA 8011

Analyte	AB	Analyte ID	Method ID
1,2,3-Trichloropropane	TX	5180	10173009
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10173009
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10173009

Method EPA 8015

Analyte	AB	Analyte ID	Method ID
Diesel range organics (DRO)	TX	9369	10173203
Ethanol	TX	4750	10173203
Ethylene glycol	TX	4785	10173203
Gasoline range organics (GRO)	TX	9408	10173203
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10173203
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10173203
Methanol	TX	4930	10173203
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10173203
n-Propanol (1-Propanol)	TX	5055	10173203
Propylene Glycol	TX	6657	10173203
tert-Butyl alcohol	TX	4420	10173203

Method EPA 8021

Analyte	AB	Analyte ID	Method ID
Benzene	TX	4375	10174400
Ethylbenzene	TX	4765	10174400
m+p-xylene	TX	5240	10174400
Methyl tert-butyl ether (MTBE)	TX	5000	10174400
o-Xylene	TX	5250	10174400
Toluene	TX	5140	10174400
Xylene (total)	TX	5260	10174400

Method EPA 8081

Analyte	AB	Analyte ID	Method ID
4,4'-DDD	TX	7355	10178402
4,4'-DDE	TX	7360	10178402

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Matrix: ***Non-Potable Water***

4,4'-DDT	TX	7365	10178402
Aldrin	TX	7025	10178402
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10178402
alpha-Chlordane	TX	7240	10178402
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10178402
Chlordane (tech.)	TX	7250	10178402
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10178402
Dieldrin	TX	7470	10178402
Endosulfan I	TX	7510	10178402
Endosulfan II	TX	7515	10178402
Endosulfan sulfate	TX	7520	10178402
Endrin	TX	7540	10178402
Endrin aldehyde	TX	7530	10178402
Endrin ketone	TX	7535	10178402
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10178402
gamma-Chlordane	TX	7245	10178402
Heptachlor	TX	7685	10178402
Heptachlor epoxide	TX	7690	10178402
Hexachlorobenzene	TX	6275	10178402
Methoxychlor	TX	7810	10178402
Mirex	TX	7870	10178402
Toxaphene (Chlorinated camphene)	TX	8250	10178402

Method EPA 8082

Analyte	**AB**	**Analyte ID**	**Method ID**
Aroclor-1016 (PCB-1016)	TX	8880	10179201
Aroclor-1221 (PCB-1221)	TX	8885	10179201
Aroclor-1232 (PCB-1232)	TX	8890	10179201
Aroclor-1242 (PCB-1242)	TX	8895	10179201
Aroclor-1248 (PCB-1248)	TX	8900	10179201
Aroclor-1254 (PCB-1254)	TX	8905	10179201

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Matrix: ***Non-Potable Water***

Aroclor-1260 (PCB-1260)	TX	8910	10179201
PCBs (total)	TX	8870	10179201

Method EPA 8151

Analyte	AB	Analyte ID	Method ID
2,4,5-T	TX	8655	10183003
2,4-D	TX	8545	10183003
2,4-DB	TX	8560	10183003
Dalapon	TX	8555	10183003
Dicamba	TX	8595	10183003
Dichloroprop (Dichlorprop, Weedone)	TX	8605	10183003
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10183003
MCPA	TX	7775	10183003
MCPP	TX	7780	10183003
Silvex (2,4,5-TP)	TX	8650	10183003

Method EPA 8260

Analyte	AB	Analyte ID	Method ID
1,1,1,2-Tetrachloroethane	TX	5105	10184404
1,1,1-Trichloroethane	TX	5160	10184404
1,1,2,2-Tetrachloroethane	TX	5110	10184404
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	TX	5195	10184404
1,1,2-Trichloroethane	TX	5165	10184404
1,1-Dichloroethane	TX	4630	10184404
1,1-Dichloroethylene	TX	4640	10184404
1,1-Dichloropropene	TX	4670	10184404
1,2,3-Trichlorobenzene	TX	5150	10184404
1,2,3-Trichloropropane	TX	5180	10184404
1,2,4-Trichlorobenzene	TX	5155	10184404
1,2,4-Trimethylbenzene	TX	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10184404
1,2-Dichlorobenzene	TX	4610	10184404

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Matrix: ***Non-Potable Water***

1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10184404
1,2-Dichloropropane	TX	4655	10184404
1,3,5-Trimethylbenzene	TX	5215	10184404
1,3-Dichlorobenzene	TX	4615	10184404
1,3-Dichloropropane	TX	4660	10184404
1,4-Dichlorobenzene	TX	4620	10184404
1,4-Dioxane (1,4-Diethyleneoxide)	TX	4735	10184404
1-Chlorohexane	TX	4510	10184404
1-Propanol	TX	5060	10184404
2,2-Dichloropropane	TX	4665	10184404
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10184404
2-Chloroethyl vinyl ether	TX	4500	10184404
2-Chlorotoluene	TX	4535	10184404
2-Hexanone (MBK)	TX	4860	10184404
2-Pentanone	TX	5045	10184404
4-Chlorotoluene	TX	4540	10184404
4-Isopropyltoluene (p-Cymene)	TX	4915	10184404
4-Methyl-2-pentanone (MIBK)	TX	4995	10184404
Acetone (2-Propanone)	TX	4315	10184404
Acetonitrile	TX	4320	10184404
Acrolein (Propenal)	TX	4325	10184404
Acrylonitrile	TX	4340	10184404
Allyl alcohol	TX	4350	10184404
Allyl chloride (3-Chloropropene)	TX	4355	10184404
Benzene	TX	4375	10184404
Benzyl chloride	TX	5635	10184404
Bromobenzene	TX	4385	10184404
Bromochloromethane	TX	4390	10184404
Bromodichloromethane	TX	4395	10184404
Bromoform	TX	4400	10184404

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Matrix: ***Non-Potable Water***

Carbon disulfide	TX	4450	10184404
Carbon tetrachloride	TX	4455	10184404
Chlorobenzene	TX	4475	10184404
Chlorodibromomethane	TX	4575	10184404
Chloroethane (Ethyl chloride)	TX	4485	10184404
Chloroform	TX	4505	10184404
Chloroprene (2-Chloro-1,3-butadiene)	TX	4525	10184404
cis-1,2-Dichloroethylene	TX	4645	10184404
cis-1,3-Dichloropropene	TX	4680	10184404
Dibromofluoromethane	TX	4590	10184404
Dibromomethane (Methylene bromide)	TX	4595	10184404
Dichlorodifluoromethane (Freon-12)	TX	4625	10184404
Diethyl ether	TX	4725	10184404
Di-isopropylether (DIPE)	TX	9375	10184404
Epichlorohydrin (1-Chloro-2,3-epoxypropane)	TX	4745	10184404
Ethanol	TX	4750	10184404
Ethyl acetate	TX	4755	10184404
Ethyl methacrylate	TX	4810	10184404
Ethylbenzene	TX	4765	10184404
Ethylene oxide	TX	4795	10184404
Ethyl-t-butylether (ETBE) (2-Ethoxy-2-methylpropane)	TX	4770	10184404
Hexachlorobutadiene	TX	4835	10184404
Iodomethane (Methyl iodide)	TX	4870	10184404
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10184404
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10184404
Isopropylbenzene (Cumene)	TX	4900	10184404
m+p-xylene	TX	5240	10184404
Methacrylonitrile	TX	4925	10184404
Methyl acetate	TX	4940	10184404
Methyl acrylate	TX	4945	10184404

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Matrix: ***Non-Potable Water***

Methyl bromide (Bromomethane)	TX	4950	10184404
Methyl chloride (Chloromethane)	TX	4960	10184404
Methyl methacrylate	TX	4990	10184404
Methyl tert-butyl ether (MTBE)	TX	5000	10184404
Methylcyclohexane	TX	4965	10184404
Methylene chloride (Dichloromethane)	TX	4975	10184404
Naphthalene	TX	5005	10184404
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10184404
n-Butylbenzene	TX	4435	10184404
n-Propylbenzene	TX	5090	10184404
o-Xylene	TX	5250	10184404
Pentachloroethane	TX	5035	10184404
Propionitrile (Ethyl cyanide)	TX	5080	10184404
Pyridine	TX	5095	10184404
sec-Butylbenzene	TX	4440	10184404
Styrene	TX	5100	10184404
T-amylmethylether (TAME)	TX	4370	10184404
tert-Butyl alcohol	TX	4420	10184404
tert-Butylbenzene	TX	4445	10184404
Tetrachloroethylene (Perchloroethylene)	TX	5115	10184404
Toluene	TX	5140	10184404
trans-1,2-Dichloroethylene	TX	4700	10184404
trans-1,3-Dichloropropylene	TX	4685	10184404
trans-1,4-Dichloro-2-butene	TX	4605	10184404
Trichloroethene (Trichloroethylene)	TX	5170	10184404
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10184404
Vinyl acetate	TX	5225	10184404
Vinyl chloride	TX	5235	10184404
Xylene (total)	TX	5260	10184404

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Matrix: ***Non-Potable Water***

Method EPA 8270

Analyte	AB	Analyte ID	Method ID
1,2,4,5-Tetrachlorobenzene	TX	6715	10185203
1,2,4-Trichlorobenzene	TX	5155	10185203
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10185203
1,2-Dichlorobenzene	TX	4610	10185203
1,2-Dinitrobenzene	TX	6155	10185203
1,2-Diphenylhydrazine	TX	6220	10185203
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10185203
1,3-Dichlorobenzene	TX	4615	10185203
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10185203
1,4-Dichlorobenzene	TX	4620	10185203
1,4-Dinitrobenzene	TX	6165	10185203
1,4-Naphthoquinone	TX	6420	10185203
1,4-Phenylenediamine	TX	6630	10185203
1-Chloronaphthalene	TX	5790	10185203
1-Naphthylamine	TX	6425	10185203
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10185203
2,3,4,6-Tetrachlorophenol	TX	6735	10185203
2,4,5-Trichlorophenol	TX	6835	10185203
2,4,5-Trimethylaniline	TX	6880	10185203
2,4,6-Trichlorophenol	TX	6840	10185203
2,4-Diaminotoluene	TX	5880	10185203
2,4-Dichlorophenol	TX	6000	10185203
2,4-Dimethylphenol	TX	6130	10185203
2,4-Dinitrophenol	TX	6175	10185203
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10185203
2,6-Dichlorophenol	TX	6005	10185203
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10185203
2-Acetylaminofluorene	TX	5515	10185203

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Matrix: ***Non-Potable Water***

2-Chloronaphthalene	TX	5795	10185203
2-Chlorophenol	TX	5800	10185203
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10185203
2-Methylaniline (o-Toluidine)	TX	5145	10185203
2-Methylnaphthalene	TX	6385	10185203
2-Methylphenol (o-Cresol)	TX	6400	10185203
2-Naphthylamine	TX	6430	10185203
2-Nitroaniline	TX	6460	10185203
2-Nitrophenol	TX	6490	10185203
2-Picoline (2-Methylpyridine)	TX	5050	10185203
3,3'-Dichlorobenzidine	TX	5945	10185203
3,3'-Dimethylbenzidine	TX	6120	10185203
3-Methylcholanthrene	TX	6355	10185203
3-Methylphenol (m-Cresol)	TX	6405	10185203
3-Nitroaniline	TX	6465	10185203
4-Aminobiphenyl	TX	5540	10185203
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10185203
4-Chloro-3-methylphenol	TX	5700	10185203
4-Chloroaniline	TX	5745	10185203
4-Chlorophenyl phenylether	TX	5825	10185203
4-Dimethyl aminoazobenzene	TX	6105	10185203
4-Methylphenol (p-Cresol)	TX	6410	10185203
4-Nitroaniline	TX	6470	10185203
4-Nitrobiphenyl	TX	6480	10185203
4-Nitrophenol	TX	6500	10185203
4-Nitroquinoline-1-oxide	TX	6510	10185203
5-Chloro-2-methylaniline	TX	5695	10185203
5-Nitro-o-toluidine	TX	6570	10185203
7,12-Dimethylbenz(a) anthracene	TX	6115	10185203
a-a-Dimethylphenethylamine	TX	6125	10185203

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Matrix: ***Non-Potable Water***

Acenaphthene	TX	5500	10185203
Acenaphthylene	TX	5505	10185203
Acetophenone	TX	5510	10185203
Aniline	TX	5545	10185203
Anthracene	TX	5555	10185203
Aramite	TX	5560	10185203
Atrazine	TX	7065	10185203
Azinphos-methyl (Guthion)	TX	7075	10185203
Azobenzene	TX	5562	10185203
Benzenethiol (Thiophenol)	TX	6750	10185203
Benzidine	TX	5595	10185203
Benzo(a)anthracene	TX	5575	10185203
Benzo(a)pyrene	TX	5580	10185203
Benzo(b)fluoranthene	TX	5585	10185203
Benzo(e)pyrene	TX	5605	10185203
Benzo(g,h,i)perylene	TX	5590	10185203
Benzo(k)fluoranthene	TX	5600	10185203
Benzoic acid	TX	5610	10185203
Benzyl alcohol	TX	5630	10185203
Biphenyl	TX	5640	10185203
bis(2-Chloroethoxy)methane	TX	5760	10185203
bis(2-Chloroethyl) ether	TX	5765	10185203
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10185203
Butyl benzyl phthalate	TX	5670	10185203
Caprolactam	TX	7180	10185203
Captan	TX	7190	10185203
Carbaryl (Sevin)	TX	7195	10185203
Carbazole	TX	5680	10185203
Carbophenothion	TX	7220	10185203
Chlorobenzilate	TX	7260	10185203

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Matrix: ***Non-Potable Water***

Chrysene	TX	5855	10185203
Coumaphos	TX	7315	10185203
Demeton	TX	7390	10185203
Demeton	TX	7390	10185203
Demeton-o	TX	7395	10185203
Demeton-s	TX	7385	10185203
Diallate	TX	7405	10185203
Dibenz(a,h) anthracene	TX	5895	10185203
Dibenz(a,j) acridine	TX	5900	10185203
Dibenzofuran	TX	5905	10185203
Dichlorovos (DDVP, Dichlorvos)	TX	8610	10185203
Diethyl phthalate	TX	6070	10185203
Dimethoate	TX	7475	10185203
Dimethoate	TX	7475	10185203
Dimethyl phthalate	TX	6135	10185203
Di-n-butyl phthalate	TX	5925	10185203
Di-n-octyl phthalate	TX	6200	10185203
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10185203
Dioxathion	TX	7495	10185203
Diphenylamine	TX	6205	10185203
Disulfoton	TX	8625	10185203
Ethion	TX	7565	10185203
Ethyl methanesulfonate	TX	6260	10185203
Famphur	TX	7580	10185203
Fluoranthene	TX	6265	10185203
Fluorene	TX	6270	10185203
Hexachlorobenzene	TX	6275	10185203
Hexachlorobutadiene	TX	4835	10185203
Hexachlorocyclopentadiene	TX	6285	10185203
Hexachloroethane	TX	4840	10185203

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Houston, TX 77099-4338

Issue Date: 5/1/2019

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Matrix: ***Non-Potable Water***

Hexachlorophene	TX	6290	10185203
Hexachloropropene	TX	6295	10185203
Indeno(1,2,3-cd) pyrene	TX	6315	10185203
Isodrin	TX	7725	10185203
Isophorone	TX	6320	10185203
Isosafrole	TX	6325	10185203
Kepone	TX	7740	10185203
Maleic anhydride	TX	6335	10185203
Methapyrilene	TX	6345	10185203
Methyl methanesulfonate	TX	6375	10185203
Methyl parathion (Parathion, methyl)	TX	7825	10185203
Mevinphos	TX	7850	10185203
Naled	TX	7905	10185203
Naphthalene	TX	5005	10185203
Nitrobenzene	TX	5015	10185203
n-Nitrosodiethylamine	TX	6525	10185203
n-Nitrosodimethylamine	TX	6530	10185203
n-Nitrosodi-n-butylamine	TX	5025	10185203
n-Nitrosodi-n-propylamine	TX	6545	10185203
n-Nitrosodiphenylamine	TX	6535	10185203
n-Nitrosomethylethylamine	TX	6550	10185203
n-Nitrosomorpholine	TX	6555	10185203
n-Nitrosopiperidine	TX	6560	10185203
n-Nitrosopyrrolidine	TX	6565	10185203
o,o,o-Triethyl phosphorothioate	TX	8290	10185203
o-Anisidine	TX	5550	10185203
Parathion, ethyl	TX	7955	10185203
p-Cresidine	TX	5860	10185203
Pentachlorobenzene	TX	6590	10185203
Pentachloronitrobenzene (PCNB)	TX	6600	10185203

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Pentachlorophenol	TX	6605	10185203
Phenacetin	TX	6610	10185203
Phenanthrene	TX	6615	10185203
Phenol	TX	6625	10185203
Phorate	TX	7985	10185203
Phosmet (Imidan)	TX	8000	10185203
Phthalic anhydride	TX	6640	10185203
Pronamide (Kerb)	TX	6650	10185203
Pyrene	TX	6665	10185203
Pyridine	TX	5095	10185203
Quinoline	TX	6670	10185203
Resorcinol	TX	6680	10185203
Safrole	TX	6685	10185203
Sulfotepp	TX	8155	10185203
Terbufos	TX	8185	10185203
Tetrachlorvinphos (Stirophos, Gardona)	TX	8197	10185203
Thionazin (Zinophos)	TX	8235	10185203
Toluene diisocyanate	TX	6775	10185203
Trifluralin (Treflan)	TX	8295	10185203

Method EPA 8290

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	TX	9516	10187209
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	TX	9519	10187209
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	TX	9420	10187209
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	TX	9426	10187209
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	TX	9423	10187209
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	TX	9471	10187209
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	TX	9453	10187209
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	TX	9474	10187209
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-HxCDD)	TX	9456	10187209

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Matrix: ***Non-Potable Water***

1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	TX	9477	10187209
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	TX	9459	10187209
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	TX	9543	10187209
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	TX	9540	10187209
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	TX	9480	10187209
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF	TX	9549	10187209
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	TX	9612	10187209
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10187209
Total Heptachlorodibenzofuran (Total HpCDF)	TX	9444	10187209
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	TX	9438	10187209
Total Hexachlorodibenzofuran (Total HxCDF)	TX	9483	10187209
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	TX	9468	10187209
Total Pentachlorodibenzofuran (Total PeCDF)	TX	9552	10187209
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	TX	9555	10187209
Total Tetrachlorodibenzofuran (Total TCDF)	TX	9615	10187209
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	TX	9609	10187209

Method EPA 8316

Analyte	**AB**	**Analyte ID**	**Method ID**
Acrylamide	TX	4330	10188202

Method EPA 8330

Analyte	**AB**	**Analyte ID**	**Method ID**
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10189807
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10189807
2,4,6-Trinitrotoluene (2,4,6-TNT)	TX	9651	10189807
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10189807
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10189807
2-Amino-4,6-dinitrotoluene (2-am-dnt)	TX	9303	10189807
2-Nitrotoluene	TX	9507	10189807
3-Nitrotoluene	TX	9510	10189807
4-Amino-2,6-dinitrotoluene (4-am-dnt)	TX	9306	10189807
4-Nitrotoluene	TX	9513	10189807

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Matrix: ***Non-Potable Water***

Methyl-2,4,6-trinitrophenylnitramine (tetryl)	TX	6415	10189807
Nitrobenzene	TX	5015	10189807
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	TX	9522	10189807
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	TX	9432	10189807

Method EPA 9014

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	10193803
Total cyanide	TX	1645	10193803

Method EPA 9038

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfate	TX	2000	10196608

Method EPA 9040

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	TX	1900	10196802

Method EPA 9050

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	10198604

Method EPA 9056

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10199209
Chloride	TX	1575	10199209
Fluoride	TX	1730	10199209
Nitrate as N	TX	1810	10199209
Nitrate-nitrite	TX	1820	10199209
Nitrite as N	TX	1840	10199209
Orthophosphate as P	TX	1870	10199209
Sulfate	TX	2000	10199209

Method EPA 9060

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Organic Carbon (TOC)	TX	2040	10200201

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Matrix: ***Non-Potable Water***

Method EPA 9065

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10200405

Method EPA 9066

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10200609

Method EPA 9250

Analyte	AB	Analyte ID	Method ID
Chloride	TX	1575	10207202

Method EPA RSK 175

Analyte	AB	Analyte ID	Method ID
2-methylpropane (Isobutane)	TX	4942	10212905
Ethane	TX	4747	10212905
Ethene	TX	4752	10212905
Methane	TX	4926	10212905
n-Butane	TX	5007	10212905
n-Propane	TX	5029	10212905

Method HACH 8000

Analyte	AB	Analyte ID	Method ID
Chemical oxygen demand (COD)	TX	1565	60003001

Method SM 2120 B

Analyte	AB	Analyte ID	Method ID
Color	TX	1605	20223807

Method SM 2310 B (4a)

Analyte	AB	Analyte ID	Method ID
Acidity, as CaCO3	TX	1500	20002806

Method SM 2320 B

Analyte	AB	Analyte ID	Method ID
Alkalinity as CaCO3	TX	1505	20045005

Method SM 2340 B

Analyte	AB	Analyte ID	Method ID

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Matrix: ***Non-Potable Water***

Total hardness as CaCO3	TX	1755	20046008

Method SM 2510 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	20048004

Method SM 2540 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-total (total solids)	TX	1950	20004608

Method SM 2540 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-filterable (TDS)	TX	1955	20049803

Method SM 2540 D

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-nonfilterable (TSS)	TX	1960	20004802

Method SM 3500-Cr B

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	TX	1045	20065809

Method SM 4500-Cl F

Analyte	**AB**	**Analyte ID**	**Method ID**
Total residual chlorine	TX	1940	20080482

Method SM 4500-Cl^- E

Analyte	**AB**	**Analyte ID**	**Method ID**
Chloride	TX	1575	20019209

Method SM 4500-CN^- C

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	TX	1645	20020808

Method SM 4500-CN^- E

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	TX	1645	20021209

Method SM 4500-CN^- G

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	20021607

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Matrix: ***Non-Potable Water***

Method SM 4500-H+ B

Analyte	AB	Analyte ID	Method ID
pH	TX	1900	20104603

Method SM 4500-NH3 D

Analyte	AB	Analyte ID	Method ID
Ammonia as N	TX	1515	20108809
Kjeldahl Nitrogen (Total Kjeldahl Nitrogen-TKN)	TX	1790	20108809

Method SM 4500-NH3 F

Analyte	AB	Analyte ID	Method ID
Ammonia as N	TX	1515	20023001

Method SM 4500-O G

Analyte	AB	Analyte ID	Method ID
Oxygen, dissolved	TX	1880	20025405

Method SM 4500-P E

Analyte	AB	Analyte ID	Method ID
Orthophosphate as P	TX	1870	20025803
Phosphorus	TX	1910	20025803

Method SM 4500-$S2^{-}$ F

Analyte	AB	Analyte ID	Method ID
Sulfide	TX	2005	20126209

Method SM 4500-SiO2 D

Analyte	AB	Analyte ID	Method ID
Silica as SiO2	TX	1990	20127202

Method SM 4500-$SO3^{-}$ B

Analyte	AB	Analyte ID	Method ID
Sulfite	TX	2015	20026806

Method SM 5210 B

Analyte	AB	Analyte ID	Method ID
Biochemical oxygen demand (BOD)	TX	1530	20027401
Carbonaceous BOD, CBOD	TX	1555	20027401

Method SM 5310 B

Analyte	AB	Analyte ID	Method ID

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Matrix: ***Non-Potable Water***

Total Organic Carbon (TOC)	TX	2040	20137206

Method SM 5310 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Organic Carbon (TOC)	TX	2040	20138209

Method SM 5540 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Surfactants - MBAS	TX	2025	20144405

Method TCEQ 1005

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208

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Matrix: ***Solid & Chemical Materials***

Method ASTM D2216

Analyte	AB	Analyte ID	Method ID
Moisture	TX	10337	ASTM D2216-05

Method EPA 1010

Analyte	AB	Analyte ID	Method ID
Ignitability	TX	1780	10116606

Method EPA 1030

Analyte	AB	Analyte ID	Method ID
Ignitability	TX	1780	10117201

Method EPA 1311

Analyte	AB	Analyte ID	Method ID
TCLP	TX	849	10118806

Method EPA 1312

Analyte	AB	Analyte ID	Method ID
SPLP	TX	850	10119003

Method EPA 1668

Analyte	AB	Analyte ID	Method ID
Decachlorobiphenyls	TX	10332	10262007
Dichlorobiphenyls	TX	464	10262007
Heptachlorobiphenyls	TX	486	10262007
Hexachlorobiphenyls	TX	487	10262007
Monochlorobiphenyls	TX	501	10262007
Nonachlorobiphenyls	TX	507	10262007
Octachlorobiphenyls	TX	508	10262007
Pentachlorobiphenyls	TX	515	10262007
Tetrachlorobiphenyls	TX	528	10262007
Trichlorobiphenyls	TX	541	10262007

Method EPA 200.8

Analyte	AB	Analyte ID	Method ID
Uranium	TX	3035	10014605

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Matrix: ***Solid & Chemical Materials***

Method EPA 300.0

Analyte	AB	Analyte ID	Method ID
Bromide	TX	1540	10053200
Chloride	TX	1575	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrate-nitrite	TX	1820	10053200
Nitrite as N	TX	1840	10053200
Orthophosphate as P	TX	1870	10053200
Sulfate	TX	2000	10053200

Method EPA 310.1

Analyte	AB	Analyte ID	Method ID
Alkalinity as CaCO3	TX	1505	10054805

Method EPA 350.3

Analyte	AB	Analyte ID	Method ID
Ammonia as N	TX	1515	10064401

Method EPA 365.3

Analyte	AB	Analyte ID	Method ID
Orthophosphate as P	TX	1870	10070801
Phosphorus	TX	1910	10070801

Method EPA 6020

Analyte	AB	Analyte ID	Method ID
Aluminum	TX	1000	10156204
Antimony	TX	1005	10156204
Arsenic	TX	1010	10156204
Barium	TX	1015	10156204
Beryllium	TX	1020	10156204
Boron	TX	1025	10156204
Cadmium	TX	1030	10156204
Calcium	TX	1035	10156204
Chromium	TX	1040	10156204

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Matrix: ***Solid & Chemical Materials***

Cobalt	TX	1050	10156204
Copper	TX	1055	10156204
Iron	TX	1070	10156204
Lead	TX	1075	10156204
Lithium	TX	1080	10156204
Magnesium	TX	1085	10156204
Manganese	TX	1090	10156204
Molybdenum	TX	1100	10156204
Nickel	TX	1105	10156204
Potassium	TX	1125	10156204
Selenium	TX	1140	10156204
Silver	TX	1150	10156204
Sodium	TX	1155	10156204
Strontium	TX	1160	10156204
Thallium	TX	1165	10156204
Tin	TX	1175	10156204
Titanium	TX	1180	10156204
Vanadium	TX	1185	10156204
Zinc	TX	1190	10156204

Method EPA 7196

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	TX	1045	10162206

Method EPA 7470

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10165603

Method EPA 7471

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10166004

Method EPA 8015

Analyte	**AB**	**Analyte ID**	**Method ID**
Diesel range organics (DRO)	TX	9369	10173203

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Matrix: ***Solid & Chemical Materials***

Ethanol	TX	4750	10173203
Ethylene glycol	TX	4785	10173203
Gasoline range organics (GRO)	TX	9408	10173203
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10173203
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10173203
Methanol	TX	4930	10173203
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10173203
n-Propanol (1-Propanol)	TX	5055	10173203
Propylene Glycol	TX	6657	10173203
tert-Butyl alcohol	TX	4420	10173203

Method EPA 8021

Analyte	**AB**	**Analyte ID**	**Method ID**
Benzene	TX	4375	10174400
Ethylbenzene	TX	4765	10174400
m+p-xylene	TX	5240	10174400
Methyl tert-butyl ether (MTBE)	TX	5000	10174400
o-Xylene	TX	5250	10174400
Toluene	TX	5140	10174400
Xylene (total)	TX	5260	10174400

Method EPA 8081

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	TX	7355	10178402
4,4'-DDE	TX	7360	10178402
4,4'-DDT	TX	7365	10178402
Aldrin	TX	7025	10178402
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10178402
alpha-Chlordane	TX	7240	10178402
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10178402
Chlordane (tech.)	TX	7250	10178402
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10178402
Dieldrin	TX	7470	10178402

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Matrix: ***Solid & Chemical Materials***

Endosulfan I	TX	7510	10178402
Endosulfan II	TX	7515	10178402
Endosulfan sulfate	TX	7520	10178402
Endrin	TX	7540	10178402
Endrin aldehyde	TX	7530	10178402
Endrin ketone	TX	7535	10178402
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10178402
gamma-Chlordane	TX	7245	10178402
Heptachlor	TX	7685	10178402
Heptachlor epoxide	TX	7690	10178402
Methoxychlor	TX	7810	10178402
Mirex	TX	7870	10178402
Toxaphene (Chlorinated camphene)	TX	8250	10178402

Method EPA 8082

Analyte	**AB**	**Analyte ID**	**Method ID**
Aroclor-1016 (PCB-1016)	TX	8880	10179201
Aroclor-1221 (PCB-1221)	TX	8885	10179201
Aroclor-1232 (PCB-1232)	TX	8890	10179201
Aroclor-1242 (PCB-1242)	TX	8895	10179201
Aroclor-1248 (PCB-1248)	TX	8900	10179201
Aroclor-1254 (PCB-1254)	TX	8905	10179201
Aroclor-1260 (PCB-1260)	TX	8910	10179201
PCBs (total)	TX	8870	10179201

Method EPA 8260

Analyte	**AB**	**Analyte ID**	**Method ID**
1,1,1,2-Tetrachloroethane	TX	5105	10184404
1,1,1-Trichloroethane	TX	5160	10184404
1,1,2,2-Tetrachloroethane	TX	5110	10184404
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	TX	5195	10184404
1,1,2-Trichloroethane	TX	5165	10184404
1,1-Dichloroethane	TX	4630	10184404

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704231-19-23

ALS Laboratory Group, Environmental Services Division (Houston, Texas)

Expiration Date: 4/30/2020

10450 Stancliff Road, Suite 210
Houston, TX 77099-4338

Issue Date: 5/1/2019

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Matrix: ***Solid & Chemical Materials***

1,1-Dichloroethylene	TX	4640	10184404
1,1-Dichloropropene	TX	4670	10184404
1,2,3-Trichlorobenzene	TX	5150	10184404
1,2,3-Trichloropropane	TX	5180	10184404
1,2,4-Trichlorobenzene	TX	5155	10184404
1,2,4-Trimethylbenzene	TX	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10184404
1,2-Dichlorobenzene	TX	4610	10184404
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10184404
1,2-Dichloropropane	TX	4655	10184404
1,3,5-Trimethylbenzene	TX	5215	10184404
1,3-Dichlorobenzene	TX	4615	10184404
1,3-Dichloropropane	TX	4660	10184404
1,4-Dichlorobenzene	TX	4620	10184404
1,4-Dioxane (1,4-Diethyleneoxide)	TX	4735	10184404
1-Chlorohexane	TX	4510	10184404
1-Propanol	TX	5060	10184404
2,2-Dichloropropane	TX	4665	10184404
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10184404
2-Chloroethyl vinyl ether	TX	4500	10184404
2-Chlorotoluene	TX	4535	10184404
2-Hexanone (MBK)	TX	4860	10184404
4-Chlorotoluene	TX	4540	10184404
4-Isopropyltoluene (p-Cymene)	TX	4915	10184404
4-Methyl-2-pentanone (MIBK)	TX	4995	10184404
Acetone (2-Propanone)	TX	4315	10184404
Acetonitrile	TX	4320	10184404
Acrolein (Propenal)	TX	4325	10184404
Acrylonitrile	TX	4340	10184404

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Matrix: ***Solid & Chemical Materials***

Allyl chloride (3-Chloropropene)	TX	4355	10184404
Benzene	TX	4375	10184404
Benzyl chloride	TX	5635	10184404
Bromobenzene	TX	4385	10184404
Bromochloromethane	TX	4390	10184404
Bromodichloromethane	TX	4395	10184404
Bromoform	TX	4400	10184404
Carbon disulfide	TX	4450	10184404
Carbon tetrachloride	TX	4455	10184404
Chlorobenzene	TX	4475	10184404
Chlorodibromomethane	TX	4575	10184404
Chloroethane (Ethyl chloride)	TX	4485	10184404
Chloroform	TX	4505	10184404
Chloroprene (2-Chloro-1,3-butadiene)	TX	4525	10184404
cis-1,2-Dichloroethylene	TX	4645	10184404
cis-1,3-Dichloropropene	TX	4680	10184404
Dibromofluoromethane	TX	4590	10184404
Dibromomethane (Methylene bromide)	TX	4595	10184404
Dichlorodifluoromethane (Freon-12)	TX	4625	10184404
Diethyl ether	TX	4725	10184404
Epichlorohydrin (1-Chloro-2,3-epoxypropane)	TX	4745	10184404
Ethanol	TX	4750	10184404
Ethyl acetate	TX	4755	10184404
Ethyl methacrylate	TX	4810	10184404
Ethylbenzene	TX	4765	10184404
Ethylene oxide	TX	4795	10184404
Hexachlorobutadiene	TX	4835	10184404
Iodomethane (Methyl iodide)	TX	4870	10184404
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10184404
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10184404

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Matrix: ***Solid & Chemical Materials***

Isopropylbenzene (Cumene)	TX	4900	10184404
m+p-xylene	TX	5240	10184404
Methacrylonitrile	TX	4925	10184404
Methyl acetate	TX	4940	10184404
Methyl acrylate	TX	4945	10184404
Methyl bromide (Bromomethane)	TX	4950	10184404
Methyl chloride (Chloromethane)	TX	4960	10184404
Methyl methacrylate	TX	4990	10184404
Methyl tert-butyl ether (MTBE)	TX	5000	10184404
Methylcyclohexane	TX	4965	10184404
Methylene chloride (Dichloromethane)	TX	4975	10184404
Naphthalene	TX	5005	10184404
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10184404
n-Butylbenzene	TX	4435	10184404
n-Propylbenzene	TX	5090	10184404
o-Xylene	TX	5250	10184404
Pentachloroethane	TX	5035	10184404
Propionitrile (Ethyl cyanide)	TX	5080	10184404
Pyridine	TX	5095	10184404
sec-Butylbenzene	TX	4440	10184404
Styrene	TX	5100	10184404
tert-Butyl alcohol	TX	4420	10184404
tert-Butylbenzene	TX	4445	10184404
Tetrachloroethylene (Perchloroethylene)	TX	5115	10184404
Toluene	TX	5140	10184404
trans-1,2-Dichloroethylene	TX	4700	10184404
trans-1,3-Dichloropropylene	TX	4685	10184404
trans-1,4-Dichloro-2-butene	TX	4605	10184404
Trichloroethene (Trichloroethylene)	TX	5170	10184404
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10184404

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Matrix: ***Solid & Chemical Materials***

Vinyl acetate	TX	5225	10184404
Vinyl chloride	TX	5235	10184404
Xylene (total)	TX	5260	10184404

Method EPA 8270

Analyte	AB	Analyte ID	Method ID
1,2,4,5-Tetrachlorobenzene	TX	6715	10185203
1,2,4-Trichlorobenzene	TX	5155	10185203
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10185203
1,2-Dichlorobenzene	TX	4610	10185203
1,2-Dinitrobenzene	TX	6155	10185203
1,2-Diphenylhydrazine	TX	6220	10185203
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10185203
1,3-Dichlorobenzene	TX	4615	10185203
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10185203
1,4-Dichlorobenzene	TX	4620	10185203
1,4-Dinitrobenzene	TX	6165	10185203
1,4-Naphthoquinone	TX	6420	10185203
1,4-Phenylenediamine	TX	6630	10185203
1-Chloronaphthalene	TX	5790	10185203
1-Naphthylamine	TX	6425	10185203
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10185203
2,3,4,6-Tetrachlorophenol	TX	6735	10185203
2,4,5-Trichlorophenol	TX	6835	10185203
2,4,5-Trimethylaniline	TX	6880	10185203
2,4,6-Trichlorophenol	TX	6840	10185203
2,4-Diaminotoluene	TX	5880	10185203
2,4-Dichlorophenol	TX	6000	10185203
2,4-Dimethylphenol	TX	6130	10185203
2,4-Dinitrophenol	TX	6175	10185203
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10185203

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Matrix: ***Solid & Chemical Materials***

2,6-Dichlorophenol	TX	6005	10185203
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10185203
2-Acetylaminofluorene	TX	5515	10185203
2-Chloronaphthalene	TX	5795	10185203
2-Chlorophenol	TX	5800	10185203
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10185203
2-Methylaniline (o-Toluidine)	TX	5145	10185203
2-Methylnaphthalene	TX	6385	10185203
2-Methylphenol (o-Cresol)	TX	6400	10185203
2-Naphthylamine	TX	6430	10185203
2-Nitroaniline	TX	6460	10185203
2-Nitrophenol	TX	6490	10185203
2-Picoline (2-Methylpyridine)	TX	5050	10185203
3,3'-Dichlorobenzidine	TX	5945	10185203
3,3'-Dimethylbenzidine	TX	6120	10185203
3-Methylcholanthrene	TX	6355	10185203
3-Methylphenol (m-Cresol)	TX	6405	10185203
3-Nitroaniline	TX	6465	10185203
4-Aminobiphenyl	TX	5540	10185203
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10185203
4-Chloro-3-methylphenol	TX	5700	10185203
4-Chloroaniline	TX	5745	10185203
4-Chlorophenyl phenylether	TX	5825	10185203
4-Methylphenol (p-Cresol)	TX	6410	10185203
4-Nitroaniline	TX	6470	10185203
4-Nitrophenol	TX	6500	10185203
4-Nitroquinoline-1-oxide	TX	6510	10185203
5-Nitro-o-toluidine	TX	6570	10185203
7,12-Dimethylbenz(a) anthracene	TX	6115	10185203
a-a-Dimethylphenethylamine	TX	6125	10185203

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Matrix: ***Solid & Chemical Materials***

Acenaphthene	TX	5500	10185203
Acenaphthylene	TX	5505	10185203
Acetophenone	TX	5510	10185203
Aniline	TX	5545	10185203
Anthracene	TX	5555	10185203
Aramite	TX	5560	10185203
Atrazine	TX	7065	10185203
Azinphos-methyl (Guthion)	TX	7075	10185203
Azobenzene	TX	5562	10185203
Benzenethiol (Thiophenol)	TX	6750	10185203
Benzidine	TX	5595	10185203
Benzo(a)anthracene	TX	5575	10185203
Benzo(a)pyrene	TX	5580	10185203
Benzo(b)fluoranthene	TX	5585	10185203
Benzo(e)pyrene	TX	5605	10185203
Benzo(g,h,i)perylene	TX	5590	10185203
Benzo(k)fluoranthene	TX	5600	10185203
Benzoic acid	TX	5610	10185203
Benzyl alcohol	TX	5630	10185203
Biphenyl	TX	5640	10185203
bis(2-Chloroethoxy)methane	TX	5760	10185203
bis(2-Chloroethyl) ether	TX	5765	10185203
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10185203
Butyl benzyl phthalate	TX	5670	10185203
Caprolactam	TX	7180	10185203
Carbaryl (Sevin)	TX	7195	10185203
Carbazole	TX	5680	10185203
Carbophenothion	TX	7220	10185203
Chlorobenzilate	TX	7260	10185203
Chrysene	TX	5855	10185203

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Matrix: ***Solid & Chemical Materials***

Demeton	TX	7390	10185203
Demeton-o	TX	7395	10185203
Demeton-s	TX	7385	10185203
Diallate	TX	7405	10185203
Dibenz(a,h) anthracene	TX	5895	10185203
Dibenz(a,j) acridine	TX	5900	10185203
Dibenzo(a,e) pyrene	TX	5890	10185203
Dibenzofuran	TX	5905	10185203
Dichlorovos (DDVP, Dichlorvos)	TX	8610	10185203
Diethyl phthalate	TX	6070	10185203
Dimethoate	TX	7475	10185203
Dimethyl phthalate	TX	6135	10185203
Di-n-butyl phthalate	TX	5925	10185203
Di-n-octyl phthalate	TX	6200	10185203
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10185203
Diphenylamine	TX	6205	10185203
Disulfoton	TX	8625	10185203
Ethyl methanesulfonate	TX	6260	10185203
Fluoranthene	TX	6265	10185203
Fluorene	TX	6270	10185203
Hexachlorobenzene	TX	6275	10185203
Hexachlorobutadiene	TX	4835	10185203
Hexachlorocyclopentadiene	TX	6285	10185203
Hexachloroethane	TX	4840	10185203
Hexachlorophene	TX	6290	10185203
Hexachloropropene	TX	6295	10185203
Indeno(1,2,3-cd) pyrene	TX	6315	10185203
Isodrin	TX	7725	10185203
Isophorone	TX	6320	10185203
Isosafrole	TX	6325	10185203

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Matrix: ***Solid & Chemical Materials***

Kepone	TX	7740	10185203
Malathion	TX	7770	10185203
Methapyrilene	TX	6345	10185203
Methyl methanesulfonate	TX	6375	10185203
Methyl parathion (Parathion, methyl)	TX	7825	10185203
Mevinphos	TX	7850	10185203
Naphthalene	TX	5005	10185203
Nitrobenzene	TX	5015	10185203
n-Nitrosodiethylamine	TX	6525	10185203
n-Nitrosodimethylamine	TX	6530	10185203
n-Nitrosodi-n-butylamine	TX	5025	10185203
n-Nitrosodi-n-propylamine	TX	6545	10185203
n-Nitrosodiphenylamine	TX	6535	10185203
n-Nitrosomethylethylamine	TX	6550	10185203
n-Nitrosomorpholine	TX	6555	10185203
n-Nitrosopiperidine	TX	6560	10185203
n-Nitrosopyrrolidine	TX	6565	10185203
o,o,o-Triethyl phosphorothioate	TX	8290	10185203
o-Anisidine	TX	5550	10185203
Parathion, ethyl	TX	7955	10185203
p-Cresidine	TX	5860	10185203
Pentachlorobenzene	TX	6590	10185203
Pentachloronitrobenzene (PCNB)	TX	6600	10185203
Pentachlorophenol	TX	6605	10185203
Phenacetin	TX	6610	10185203
Phenanthrene	TX	6615	10185203
Phenol	TX	6625	10185203
Phorate	TX	7985	10185203
Pronamide (Kerb)	TX	6650	10185203
Pyrene	TX	6665	10185203

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Matrix: ***Solid & Chemical Materials***

Pyridine	TX	5095	10185203
Quinoline	TX	6670	10185203
Safrole	TX	6685	10185203
Sulfotepp	TX	8155	10185203
Terbufos	TX	8185	10185203
Tetrachlorvinphos (Stirophos, Gardona)	TX	8197	10185203
Thionazin (Zinophos)	TX	8235	10185203
Toluene diisocyanate	TX	6775	10185203

Method EPA 8290

Analyte	AB	Analyte ID	Method ID
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	TX	9516	10187209
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	TX	9519	10187209
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	TX	9420	10187209
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	TX	9426	10187209
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	TX	9423	10187209
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	TX	9471	10187209
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	TX	9453	10187209
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	TX	9474	10187209
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-HxCDD)	TX	9456	10187209
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	TX	9477	10187209
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	TX	9459	10187209
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	TX	9543	10187209
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	TX	9540	10187209
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	TX	9480	10187209
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF	TX	9549	10187209
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	TX	9612	10187209
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10187209
Total Heptachlorodibenzofuran (Total HpCDF)	TX	9444	10187209
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	TX	9438	10187209
Total Hexachlorodibenzofuran (Total HxCDF)	TX	9483	10187209

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Matrix: ***Solid & Chemical Materials***

Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	TX	9468	10187209
Total Pentachlorodibenzofuran (Total PeCDF)	TX	9552	10187209
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	TX	9555	10187209
Total Tetrachlorodibenzofuran (Total TCDF)	TX	9615	10187209
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	TX	9609	10187209

Method EPA 8316

Analyte	**AB**	**Analyte ID**	**Method ID**
Acrylamide	TX	4330	10188202

Method EPA 8330

Analyte	**AB**	**Analyte ID**	**Method ID**
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10189807
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10189807
2,4,6-Trinitrotoluene (2,4,6-TNT)	TX	9651	10189807
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10189807
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10189807
2-Amino-4,6-dinitrotoluene (2-am-dnt)	TX	9303	10189807
2-Nitrotoluene	TX	9507	10189807
3-Nitrotoluene	TX	9510	10189807
4-Amino-2,6-dinitrotoluene (4-am-dnt)	TX	9306	10189807
4-Nitrotoluene	TX	9513	10189807
Methyl-2,4,6-trinitrophenylnitramine (tetryl)	TX	6415	10189807
Nitrobenzene	TX	5015	10189807
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	TX	9522	10189807
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	TX	9432	10189807

Method EPA 9014

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	10193803
Total cyanide	TX	1645	10193803

Method EPA 9038

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfate	TX	2000	10196608

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Houston, TX 77099-4338

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These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Solid & Chemical Materials***

Method EPA 9040

Analyte	AB	Analyte ID	Method ID
Corrosivity	TX	1615	10197203
pH	TX	1900	10196802

Method EPA 9045

Analyte	AB	Analyte ID	Method ID
Corrosivity	TX	1615	10197805
pH	TX	1900	10197805

Method EPA 9050

Analyte	AB	Analyte ID	Method ID
Conductivity	TX	1610	10198604

Method EPA 9056

Analyte	AB	Analyte ID	Method ID
Bromide	TX	1540	10199209
Chloride	TX	1575	10199209
Fluoride	TX	1730	10199209
Nitrate as N	TX	1810	10199209
Nitrate-nitrite	TX	1820	10199209
Nitrite as N	TX	1840	10199209
Orthophosphate as P	TX	1870	10199209
Sulfate	TX	2000	10199209

Method EPA 9060

Analyte	AB	Analyte ID	Method ID
Total Organic Carbon (TOC)	TX	2040	10200201

Method EPA 9065

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10200405

Method EPA 9071

Analyte	AB	Analyte ID	Method ID
n-Hexane Extractable Material (HEM) (O&G)	TX	1803	10201204

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704231-19-23

ALS Laboratory Group, Environmental Services Division (Houston, Texas)

Expiration Date: 4/30/2020

10450 Stancliff Road, Suite 210
Houston, TX 77099-4338

Issue Date: 5/1/2019

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Solid & Chemical Materials***

Method	Analyte	AB	Analyte ID	Method ID
EPA 9095	Paint Filter Liquids Test	TX	10312	10204009
EPA 9250	Chloride	TX	1575	10207202
SM 2320 B	Alkalinity as CaCO3	TX	1505	20045005
SM 2510 B	Conductivity	TX	1610	20048004
SM 2540 G	Residue-total (total solids)	TX	1950	20005203
SSA/ASA Part 3:34	Carbon, organic (Walkley-Black)	TX	10340	SSA/ASA Pt 3:34
TCEQ 1005	Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208

10450 Stancliff Rd. Suite 210
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February 19, 2020

Eric Matzner
Golder Associates Inc.
2201 Double Creek Drive
Suite 4004
Round Rock, TX 78664

Work Order: **HS20020447**

Laboratory Results for: **Houston TX-Wood Preserving Works**

Dear Eric,

ALS Environmental received 17 sample(s) on Feb 11, 2020 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates Inc.	**TRRP Laboratory Data Package Cover Page**
Project:	Houston TX-Wood Preserving Works	
WorkOrder:	**HS20020447**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates Inc.	**TRRP Laboratory Data Package Cover Page**
Project:	Houston TX-Wood Preserving Works	
WorkOrder:	**HS20020447**	

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 02/19/2020				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS20020447				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 150597,150608,R356459				
#[1]	A[2]	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?	X				
		Were % moisture (or solids) reported for all soil and sediment samples?	X				
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?	X				
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?		X			2
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				3
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 02/19/2020				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS20020447				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 150597,150608,R356459				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?			X		
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?			X		
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 02/19/2020
Project Name: Houston TX-Wood Preserving Works	Laboratory Job Number: HS20020447
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 150597,150608,R356459

ER#[5]	Description
1	Batch 150609, Semivolatile Organics Method SW8270, sample HS20020449-01, MS and MSD were performed on unrelated sample.
2	Batch 150609, Semivolatile Organics Method SW8270, sample HS20020449-01, MS/MSD RPD is for an unrelated sample.
3	Batch 150597, Semivolatile Organics Method SW8270, samples SO-1620-SSO03(0-2)-20200210, SO-1620-SSO07(0-2)-20200210 and SO-1620-SSO08(0-2)-20200210: the GCMS semi-volatile extract of the samples were run at a dilution due to a high level of matrix interference.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Work Order: HS20020447

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20020447-01	SO-1620-SSO01(0-2)-20200210	Soil		10-Feb-2020 13:10	11-Feb-2020 14:40	☐
HS20020447-02	SO-1620-SSO03(0-2)-20200210	Soil		10-Feb-2020 13:40	11-Feb-2020 14:40	☐
HS20020447-03	SO-1620-SSO04(0-2)-20200210	Soil		10-Feb-2020 13:50	11-Feb-2020 14:40	☐
HS20020447-04	SO-1620-SSO06(0-2)-20200210	Soil		10-Feb-2020 14:00	11-Feb-2020 14:40	☐
HS20020447-05	SO-1620-SSO07(0-2)-20200210	Soil		10-Feb-2020 14:10	11-Feb-2020 14:40	☐
HS20020447-06	SO-1620-SSO08(0-2)-20200210	Soil		10-Feb-2020 14:20	11-Feb-2020 14:40	☐
HS20020447-07	SO-1620-SSO09(0-2)-20200210	Soil		10-Feb-2020 14:30	11-Feb-2020 14:40	☐
HS20020447-08	SO-1620-SSO10(0-2)-20200210	Soil		10-Feb-2020 14:45	11-Feb-2020 14:40	☐
HS20020447-09	SO-1620-SSO05(0-2)-20200211	Soil		11-Feb-2020 09:25	11-Feb-2020 14:40	☐
HS20020447-10	SO-1620-SSO11(0-2)-20200211	Soil		11-Feb-2020 09:40	11-Feb-2020 14:40	☐
HS20020447-11	SO-1620-SSO12(0-2)-20200211	Soil		11-Feb-2020 09:45	11-Feb-2020 14:40	☐
HS20020447-12	SO-1620-SSO13(0-2)-20200211	Soil		11-Feb-2020 09:50	11-Feb-2020 14:40	☐
HS20020447-13	SO-1620-SSO14(0-2)-20200211	Soil		11-Feb-2020 10:00	11-Feb-2020 14:40	☐
HS20020447-14	SO-1620-SSO15(0-2)-20200211	Soil		11-Feb-2020 10:19	11-Feb-2020 14:40	☐
HS20020447-15	SO-1620-SSO02(0-2)-20200211	Soil		11-Feb-2020 11:00	11-Feb-2020 14:40	☐
HS20020447-16	SO-1620-FD01-20200210	Soil		10-Feb-2020 00:00	11-Feb-2020 14:40	☐
HS20020447-17	SO-1620-FD02-20200211	Soil		11-Feb-2020 00:00	11-Feb-2020 14:40	☐

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SSO01(0-2)-20200210
Collection Date: 10-Feb-2020 13:10

ANALYTICAL REPORT
WorkOrder:HS20020447
Lab ID:HS20020447-01
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3541 / 13-Feb-2020		Analyst: GEY
Pentachlorophenol	**0.20**		**0.0038**	**0.0076**	**mg/Kg-dry**	1	13-Feb-2020 21:07
Surr: 2,4,6-Tribromophenol	*67.2*			*36-126*	*%REC*	*1*	*13-Feb-2020 21:07*
Surr: 2-Fluorobiphenyl	*58.5*			*43-125*	*%REC*	*1*	*13-Feb-2020 21:07*
Surr: 2-Fluorophenol	*56.5*			*37-125*	*%REC*	*1*	*13-Feb-2020 21:07*
Surr: 4-Terphenyl-d14	*67.2*			*32-125*	*%REC*	*1*	*13-Feb-2020 21:07*
Surr: Nitrobenzene-d5	*52.2*			*37-125*	*%REC*	*1*	*13-Feb-2020 21:07*
Surr: Phenol-d6	*59.5*			*40-125*	*%REC*	*1*	*13-Feb-2020 21:07*
MOISTURE - ASTM D2216	**Method:ASTM D2216**						Analyst: DFF
Percent Moisture	**13.4**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SSO03(0-2)-20200210
Collection Date: 10-Feb-2020 13:40

ANALYTICAL REPORT
WorkOrder:HS20020447
Lab ID:HS20020447-02
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3541 / 13-Feb-2020		Analyst: GEY
Pentachlorophenol	**3.7**		**0.074**	**0.15**	**mg/Kg-dry**	20	14-Feb-2020 13:44
Surr: 2,4,6-Tribromophenol	*89.2*			*36-126*	*%REC*	*20*	*14-Feb-2020 13:44*
Surr: 2-Fluorobiphenyl	*72.4*			*43-125*	*%REC*	*20*	*14-Feb-2020 13:44*
Surr: 2-Fluorophenol	*48.7*			*37-125*	*%REC*	*20*	*14-Feb-2020 13:44*
Surr: 4-Terphenyl-d14	*90.5*			*32-125*	*%REC*	*20*	*14-Feb-2020 13:44*
Surr: Nitrobenzene-d5	*43.8*			*37-125*	*%REC*	*20*	*14-Feb-2020 13:44*
Surr: Phenol-d6	*52.9*			*40-125*	*%REC*	*20*	*14-Feb-2020 13:44*
MOISTURE - ASTM D2216	**Method:ASTM D2216**						Analyst: DFF
Percent Moisture	**10.9**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SSO04(0-2)-20200210
Collection Date: 10-Feb-2020 13:50

ANALYTICAL REPORT
WorkOrder:HS20020447
Lab ID:HS20020447-03
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3541 / 13-Feb-2020		Analyst: GEY
Pentachlorophenol	**0.13**		**0.0036**	**0.0072**	**mg/Kg-dry**	1	13-Feb-2020 21:45
Surr: 2,4,6-Tribromophenol	*81.4*			*36-126*	*%REC*	*1*	*13-Feb-2020 21:45*
Surr: 2-Fluorobiphenyl	*76.4*			*43-125*	*%REC*	*1*	*13-Feb-2020 21:45*
Surr: 2-Fluorophenol	*61.7*			*37-125*	*%REC*	*1*	*13-Feb-2020 21:45*
Surr: 4-Terphenyl-d14	*79.9*			*32-125*	*%REC*	*1*	*13-Feb-2020 21:45*
Surr: Nitrobenzene-d5	*52.4*			*37-125*	*%REC*	*1*	*13-Feb-2020 21:45*
Surr: Phenol-d6	*61.1*			*40-125*	*%REC*	*1*	*13-Feb-2020 21:45*
MOISTURE - ASTM D2216	**Method:ASTM D2216**						Analyst: DFF
Percent Moisture	**8.75**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SSO06(0-2)-20200210
Collection Date: 10-Feb-2020 14:00

ANALYTICAL REPORT
WorkOrder:HS20020447
Lab ID:HS20020447-04
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3541 / 13-Feb-2020		Analyst: GEY
Pentachlorophenol	**0.26**		**0.0039**	**0.0078**	**mg/Kg-dry**	1	13-Feb-2020 22:04
Surr: 2,4,6-Tribromophenol	*56.6*			*36-126*	*%REC*	*1*	*13-Feb-2020 22:04*
Surr: 2-Fluorobiphenyl	*58.8*			*43-125*	*%REC*	*1*	*13-Feb-2020 22:04*
Surr: 2-Fluorophenol	*39.0*			*37-125*	*%REC*	*1*	*13-Feb-2020 22:04*
Surr: 4-Terphenyl-d14	*64.6*			*32-125*	*%REC*	*1*	*13-Feb-2020 22:04*
Surr: Nitrobenzene-d5	*58.3*			*37-125*	*%REC*	*1*	*13-Feb-2020 22:04*
Surr: Phenol-d6	*44.1*			*40-125*	*%REC*	*1*	*13-Feb-2020 22:04*
MOISTURE - ASTM D2216	**Method:ASTM D2216**						Analyst: DFF
Percent Moisture	**15.6**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SSO07(0-2)-20200210
Collection Date: 10-Feb-2020 14:10

ANALYTICAL REPORT
WorkOrder:HS20020447
Lab ID:HS20020447-05
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3541 / 13-Feb-2020		Analyst: GEY
Pentachlorophenol	**6.7**		**0.077**	**0.15**	**mg/Kg-dry**	20	14-Feb-2020 14:03
Surr: 2,4,6-Tribromophenol	*109*			*36-126*	*%REC*	*20*	*14-Feb-2020 14:03*
Surr: 2-Fluorobiphenyl	*98.8*			*43-125*	*%REC*	*20*	*14-Feb-2020 14:03*
Surr: 2-Fluorophenol	*78.9*			*37-125*	*%REC*	*20*	*14-Feb-2020 14:03*
Surr: 4-Terphenyl-d14	*114*			*32-125*	*%REC*	*20*	*14-Feb-2020 14:03*
Surr: Nitrobenzene-d5	*63.9*			*37-125*	*%REC*	*20*	*14-Feb-2020 14:03*
Surr: Phenol-d6	*65.5*			*40-125*	*%REC*	*20*	*14-Feb-2020 14:03*
MOISTURE - ASTM D2216	**Method:ASTM D2216**						Analyst: DFF
Percent Moisture	**15.7**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SSO08(0-2)-20200210
Collection Date: 10-Feb-2020 14:20

ANALYTICAL REPORT
WorkOrder:HS20020447
Lab ID:HS20020447-06
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3541 / 13-Feb-2020		Analyst: GEY
Pentachlorophenol	**13**		**0.20**	**0.39**	**mg/Kg-dry**	50	14-Feb-2020 14:22
Surr: 2,4,6-Tribromophenol	*113*			*36-126*	*%REC*	*50*	*14-Feb-2020 14:22*
Surr: 2-Fluorobiphenyl	*95.1*			*43-125*	*%REC*	*50*	*14-Feb-2020 14:22*
Surr: 2-Fluorophenol	*67.8*			*37-125*	*%REC*	*50*	*14-Feb-2020 14:22*
Surr: 4-Terphenyl-d14	*34.1*			*32-125*	*%REC*	*50*	*14-Feb-2020 14:22*
Surr: Nitrobenzene-d5	*57.8*			*37-125*	*%REC*	*50*	*14-Feb-2020 14:22*
Surr: Phenol-d6	*66.1*			*40-125*	*%REC*	*50*	*14-Feb-2020 14:22*
MOISTURE - ASTM D2216	**Method:ASTM D2216**						Analyst: DFF
Percent Moisture	**16.9**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SSO09(0-2)-20200210
Collection Date: 10-Feb-2020 14:30

ANALYTICAL REPORT
WorkOrder:HS20020447
Lab ID:HS20020447-07
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3541 / 13-Feb-2020		Analyst: GEY
Pentachlorophenol	**0.21**		**0.0040**	**0.0080**	**mg/Kg-dry**	1	13-Feb-2020 23:01
Surr: 2,4,6-Tribromophenol	*69.0*			*36-126*	*%REC*	*1*	*13-Feb-2020 23:01*
Surr: 2-Fluorobiphenyl	*72.1*			*43-125*	*%REC*	*1*	*13-Feb-2020 23:01*
Surr: 2-Fluorophenol	*60.1*			*37-125*	*%REC*	*1*	*13-Feb-2020 23:01*
Surr: 4-Terphenyl-d14	*74.1*			*32-125*	*%REC*	*1*	*13-Feb-2020 23:01*
Surr: Nitrobenzene-d5	*41.9*			*37-125*	*%REC*	*1*	*13-Feb-2020 23:01*
Surr: Phenol-d6	*47.6*			*40-125*	*%REC*	*1*	*13-Feb-2020 23:01*
MOISTURE - ASTM D2216	**Method:ASTM D2216**						Analyst: DFF
Percent Moisture	**18.9**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SSO10(0-2)-20200210
Collection Date: 10-Feb-2020 14:45

ANALYTICAL REPORT
WorkOrder:HS20020447
Lab ID:HS20020447-08
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3541 / 13-Feb-2020		Analyst: LG
Pentachlorophenol	**0.13**		**0.0040**	**0.0080**	**mg/Kg-dry**	1	17-Feb-2020 13:25
Surr: 2,4,6-Tribromophenol	*88.3*			*36-126*	*%REC*	*1*	*17-Feb-2020 13:25*
Surr: 2-Fluorobiphenyl	*75.1*			*43-125*	*%REC*	*1*	*17-Feb-2020 13:25*
Surr: 2-Fluorophenol	*64.2*			*37-125*	*%REC*	*1*	*17-Feb-2020 13:25*
Surr: 4-Terphenyl-d14	*86.1*			*32-125*	*%REC*	*1*	*17-Feb-2020 13:25*
Surr: Nitrobenzene-d5	*58.8*			*37-125*	*%REC*	*1*	*17-Feb-2020 13:25*
Surr: Phenol-d6	*60.7*			*40-125*	*%REC*	*1*	*17-Feb-2020 13:25*
MOISTURE - ASTM D2216	**Method:ASTM D2216**						Analyst: DFF
Percent Moisture	**17.4**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SSO05(0-2)-20200211
Collection Date: 11-Feb-2020 09:25

ANALYTICAL REPORT
WorkOrder:HS20020447
Lab ID:HS20020447-09
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3541 / 13-Feb-2020		Analyst: LG
Pentachlorophenol	**0.062**		**0.0038**	**0.0077**	**mg/Kg-dry**	1	17-Feb-2020 13:44
Surr: 2,4,6-Tribromophenol	*109*			*36-126*	*%REC*	*1*	*17-Feb-2020 13:44*
Surr: 2-Fluorobiphenyl	*88.8*			*43-125*	*%REC*	*1*	*17-Feb-2020 13:44*
Surr: 2-Fluorophenol	*72.8*			*37-125*	*%REC*	*1*	*17-Feb-2020 13:44*
Surr: 4-Terphenyl-d14	*97.9*			*32-125*	*%REC*	*1*	*17-Feb-2020 13:44*
Surr: Nitrobenzene-d5	*73.6*			*37-125*	*%REC*	*1*	*17-Feb-2020 13:44*
Surr: Phenol-d6	*69.6*			*40-125*	*%REC*	*1*	*17-Feb-2020 13:44*
MOISTURE - ASTM D2216	**Method:ASTM D2216**						Analyst: DFF
Percent Moisture	**14.8**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SSO11(0-2)-20200211
Collection Date: 11-Feb-2020 09:40

ANALYTICAL REPORT
WorkOrder:HS20020447
Lab ID:HS20020447-10
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3541 / 13-Feb-2020		Analyst: LG
Pentachlorophenol	**0.22**		**0.0035**	**0.0071**	**mg/Kg-dry**	1	17-Feb-2020 14:03
Surr: 2,4,6-Tribromophenol	*94.7*			*36-126*	*%REC*	*1*	*17-Feb-2020 14:03*
Surr: 2-Fluorobiphenyl	*75.6*			*43-125*	*%REC*	*1*	*17-Feb-2020 14:03*
Surr: 2-Fluorophenol	*69.1*			*37-125*	*%REC*	*1*	*17-Feb-2020 14:03*
Surr: 4-Terphenyl-d14	*84.4*			*32-125*	*%REC*	*1*	*17-Feb-2020 14:03*
Surr: Nitrobenzene-d5	*67.4*			*37-125*	*%REC*	*1*	*17-Feb-2020 14:03*
Surr: Phenol-d6	*65.6*			*40-125*	*%REC*	*1*	*17-Feb-2020 14:03*
MOISTURE - ASTM D2216	**Method:ASTM D2216**						Analyst: DFF
Percent Moisture	**7.94**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SSO12(0-2)-20200211
Collection Date: 11-Feb-2020 09:45

ANALYTICAL REPORT
WorkOrder:HS20020447
Lab ID:HS20020447-11
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3541 / 13-Feb-2020		Analyst: LG
Pentachlorophenol	**0.0059**	J	**0.0038**	**0.0077**	**mg/Kg-dry**	1	17-Feb-2020 14:22
Surr: 2,4,6-Tribromophenol	*99.2*			*36-126*	*%REC*	*1*	*17-Feb-2020 14:22*
Surr: 2-Fluorobiphenyl	*70.9*			*43-125*	*%REC*	*1*	*17-Feb-2020 14:22*
Surr: 2-Fluorophenol	*72.3*			*37-125*	*%REC*	*1*	*17-Feb-2020 14:22*
Surr: 4-Terphenyl-d14	*88.9*			*32-125*	*%REC*	*1*	*17-Feb-2020 14:22*
Surr: Nitrobenzene-d5	*71.2*			*37-125*	*%REC*	*1*	*17-Feb-2020 14:22*
Surr: Phenol-d6	*64.8*			*40-125*	*%REC*	*1*	*17-Feb-2020 14:22*
MOISTURE - ASTM D2216	**Method:ASTM D2216**						Analyst: DFF
Percent Moisture	**14.7**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SSO13(0-2)-20200211
Collection Date: 11-Feb-2020 09:50

ANALYTICAL REPORT
WorkOrder:HS20020447
Lab ID:HS20020447-12
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3541 / 13-Feb-2020		Analyst: LG
Pentachlorophenol	**0.090**		**0.0036**	**0.0072**	**mg/Kg-dry**	1	17-Feb-2020 14:41
Surr: 2,4,6-Tribromophenol	*89.4*			*36-126*	*%REC*	*1*	*17-Feb-2020 14:41*
Surr: 2-Fluorobiphenyl	*75.2*			*43-125*	*%REC*	*1*	*17-Feb-2020 14:41*
Surr: 2-Fluorophenol	*65.6*			*37-125*	*%REC*	*1*	*17-Feb-2020 14:41*
Surr: 4-Terphenyl-d14	*77.5*			*32-125*	*%REC*	*1*	*17-Feb-2020 14:41*
Surr: Nitrobenzene-d5	*61.9*			*37-125*	*%REC*	*1*	*17-Feb-2020 14:41*
Surr: Phenol-d6	*57.5*			*40-125*	*%REC*	*1*	*17-Feb-2020 14:41*
MOISTURE - ASTM D2216	**Method:ASTM D2216**						Analyst: DFF
Percent Moisture	**8.83**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SSO14(0-2)-20200211
Collection Date: 11-Feb-2020 10:00

ANALYTICAL REPORT
WorkOrder:HS20020447
Lab ID:HS20020447-13
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3541 / 13-Feb-2020		Analyst: LG
Pentachlorophenol		U	0.0041	0.0082	mg/Kg-dry	1	17-Feb-2020 15:00
Surr: 2,4,6-Tribromophenol	*91.8*			*36-126*	*%REC*	*1*	*17-Feb-2020 15:00*
Surr: 2-Fluorobiphenyl	*86.2*			*43-125*	*%REC*	*1*	*17-Feb-2020 15:00*
Surr: 2-Fluorophenol	*67.2*			*37-125*	*%REC*	*1*	*17-Feb-2020 15:00*
Surr: 4-Terphenyl-d14	*87.8*			*32-125*	*%REC*	*1*	*17-Feb-2020 15:00*
Surr: Nitrobenzene-d5	*65.4*			*37-125*	*%REC*	*1*	*17-Feb-2020 15:00*
Surr: Phenol-d6	*64.3*			*40-125*	*%REC*	*1*	*17-Feb-2020 15:00*
MOISTURE - ASTM D2216	**Method:ASTM D2216**						Analyst: DFF
Percent Moisture	**19.4**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SSO15(0-2)-20200211
Collection Date: 11-Feb-2020 10:19

ANALYTICAL REPORT
WorkOrder:HS20020447
Lab ID:HS20020447-14
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3541 / 13-Feb-2020		Analyst: LG
Pentachlorophenol		U	0.0040	0.0080	mg/Kg-dry	1	17-Feb-2020 15:20
Surr: 2,4,6-Tribromophenol	*62.2*			*36-126*	*%REC*	*1*	*17-Feb-2020 15:20*
Surr: 2-Fluorobiphenyl	*67.1*			*43-125*	*%REC*	*1*	*17-Feb-2020 15:20*
Surr: 2-Fluorophenol	*55.0*			*37-125*	*%REC*	*1*	*17-Feb-2020 15:20*
Surr: 4-Terphenyl-d14	*66.3*			*32-125*	*%REC*	*1*	*17-Feb-2020 15:20*
Surr: Nitrobenzene-d5	*47.6*			*37-125*	*%REC*	*1*	*17-Feb-2020 15:20*
Surr: Phenol-d6	*49.9*			*40-125*	*%REC*	*1*	*17-Feb-2020 15:20*
MOISTURE - ASTM D2216	**Method:ASTM D2216**						Analyst: DFF
Percent Moisture	**18.2**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SSO02(0-2)-20200211
Collection Date: 11-Feb-2020 11:00

ANALYTICAL REPORT
WorkOrder:HS20020447
Lab ID:HS20020447-15
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3541 / 13-Feb-2020		Analyst: LG
Pentachlorophenol	**0.032**		**0.0038**	**0.0077**	**mg/Kg-dry**	1	17-Feb-2020 15:39
Surr: 2,4,6-Tribromophenol	*91.7*			*36-126*	*%REC*	*1*	*17-Feb-2020 15:39*
Surr: 2-Fluorobiphenyl	*71.6*			*43-125*	*%REC*	*1*	*17-Feb-2020 15:39*
Surr: 2-Fluorophenol	*58.4*			*37-125*	*%REC*	*1*	*17-Feb-2020 15:39*
Surr: 4-Terphenyl-d14	*68.4*			*32-125*	*%REC*	*1*	*17-Feb-2020 15:39*
Surr: Nitrobenzene-d5	*56.2*			*37-125*	*%REC*	*1*	*17-Feb-2020 15:39*
Surr: Phenol-d6	*58.3*			*40-125*	*%REC*	*1*	*17-Feb-2020 15:39*
MOISTURE - ASTM D2216	**Method:ASTM D2216**						Analyst: DFF
Percent Moisture	**14.9**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-FD01-20200210
Collection Date: 10-Feb-2020 00:00

ANALYTICAL REPORT
WorkOrder:HS20020447
Lab ID:HS20020447-16
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3541 / 13-Feb-2020		Analyst: LG
Pentachlorophenol	**3.9**		**0.042**	**0.083**	**mg/Kg-dry**	10	17-Feb-2020 16:36
Surr: 2,4,6-Tribromophenol	*112*			*36-126*	*%REC*	*10*	*17-Feb-2020 16:36*
Surr: 2-Fluorobiphenyl	*103*			*43-125*	*%REC*	*10*	*17-Feb-2020 16:36*
Surr: 2-Fluorophenol	*78.1*			*37-125*	*%REC*	*10*	*17-Feb-2020 16:36*
Surr: 4-Terphenyl-d14	*102*			*32-125*	*%REC*	*10*	*17-Feb-2020 16:36*
Surr: Nitrobenzene-d5	*70.3*			*37-125*	*%REC*	*10*	*17-Feb-2020 16:36*
Surr: Phenol-d6	*86.3*			*40-125*	*%REC*	*10*	*17-Feb-2020 16:36*
MOISTURE - ASTM D2216	**Method:ASTM D2216**						Analyst: DFF
Percent Moisture	**22.2**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-FD02-20200211
Collection Date: 11-Feb-2020 00:00

ANALYTICAL REPORT
WorkOrder:HS20020447
Lab ID:HS20020447-17
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3541 / 13-Feb-2020		Analyst: LG
Pentachlorophenol	U		0.0041	0.0083	mg/Kg-dry	1	17-Feb-2020 16:17
Surr: 2,4,6-Tribromophenol	*104*			*36-126*	*%REC*	*1*	*17-Feb-2020 16:17*
Surr: 2-Fluorobiphenyl	*86.2*			*43-125*	*%REC*	*1*	*17-Feb-2020 16:17*
Surr: 2-Fluorophenol	*68.9*			*37-125*	*%REC*	*1*	*17-Feb-2020 16:17*
Surr: 4-Terphenyl-d14	*93.7*			*32-125*	*%REC*	*1*	*17-Feb-2020 16:17*
Surr: Nitrobenzene-d5	*74.4*			*37-125*	*%REC*	*1*	*17-Feb-2020 16:17*
Surr: Phenol-d6	*55.5*			*40-125*	*%REC*	*1*	*17-Feb-2020 16:17*
MOISTURE - ASTM D2216	**Method:ASTM D2216**						Analyst: DFF
Percent Moisture	**20.7**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Weight / Prep Log

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020447

Batch ID: 150597 **Start Date:** 13 Feb 2020 11:26 **End Date:** 13 Feb 2020 16:00
Method: SV SOXHLET EXTRACT-LOWLEVEL-SW3541 **Prep Code:** 3541_B_LOW

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20020447-01		30.19 (g)	1 (mL)	0.03312
HS20020447-02		30.18 (g)	1 (mL)	0.03313
HS20020447-03		30.02 (g)	1 (mL)	0.03331
HS20020447-04		30.12 (g)	1 (mL)	0.0332
HS20020447-05		30.45 (g)	1 (mL)	0.03284
HS20020447-06		30.32 (g)	1 (mL)	0.03298
HS20020447-07		30.37 (g)	1 (mL)	0.03293

Batch ID: 150608 **Start Date:** 13 Feb 2020 13:39 **End Date:** 13 Feb 2020 18:00
Method: SV SOXHLET EXTRACT-LOWLEVEL-SW3541 **Prep Code:** 3541_B_LOW

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20020447-08		30.05 (g)	1 (mL)	0.03328
HS20020447-09		30.32 (g)	1 (mL)	0.03298
HS20020447-10		30.32 (g)	1 (mL)	0.03298
HS20020447-11		30.19 (g)	1 (mL)	0.03312
HS20020447-12		30.11 (g)	1 (mL)	0.03321
HS20020447-13		30.02 (g)	1 (mL)	0.03331
HS20020447-14		30.12 (g)	1 (mL)	0.0332
HS20020447-15		30.37 (g)	1 (mL)	0.03293
HS20020447-16		30.48 (g)	1 (mL)	0.03281
HS20020447-17		30.25 (g)	1 (mL)	0.03306

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020447

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 150597 (0)	**Test Name :** LOW-LEVEL SEMIVOLATILES BY 8270D				**Matrix:** Soil	
HS20020447-01	SO-1620-SSO01(0-2)-20200210	10 Feb 2020 13:10		13 Feb 2020 11:26	13 Feb 2020 21:07	1
HS20020447-02	SO-1620-SSO03(0-2)-20200210	10 Feb 2020 13:40		13 Feb 2020 11:26	14 Feb 2020 13:44	20
HS20020447-03	SO-1620-SSO04(0-2)-20200210	10 Feb 2020 13:50		13 Feb 2020 11:26	13 Feb 2020 21:45	1
HS20020447-04	SO-1620-SSO06(0-2)-20200210	10 Feb 2020 14:00		13 Feb 2020 11:26	13 Feb 2020 22:04	1
HS20020447-05	SO-1620-SSO07(0-2)-20200210	10 Feb 2020 14:10		13 Feb 2020 11:26	14 Feb 2020 14:03	20
HS20020447-06	SO-1620-SSO08(0-2)-20200210	10 Feb 2020 14:20		13 Feb 2020 11:26	14 Feb 2020 14:22	50
HS20020447-07	SO-1620-SSO09(0-2)-20200210	10 Feb 2020 14:30		13 Feb 2020 11:26	13 Feb 2020 23:01	1
Batch ID: 150608 (0)	**Test Name :** LOW-LEVEL SEMIVOLATILES BY 8270D				**Matrix:** Soil	
HS20020447-08	SO-1620-SSO10(0-2)-20200210	10 Feb 2020 14:45		13 Feb 2020 13:39	17 Feb 2020 13:25	1
HS20020447-09	SO-1620-SSO05(0-2)-20200211	11 Feb 2020 09:25		13 Feb 2020 13:39	17 Feb 2020 13:44	1
HS20020447-10	SO-1620-SSO11(0-2)-20200211	11 Feb 2020 09:40		13 Feb 2020 13:39	17 Feb 2020 14:03	1
HS20020447-11	SO-1620-SSO12(0-2)-20200211	11 Feb 2020 09:45		13 Feb 2020 13:39	17 Feb 2020 14:22	1
HS20020447-12	SO-1620-SSO13(0-2)-20200211	11 Feb 2020 09:50		13 Feb 2020 13:39	17 Feb 2020 14:41	1
HS20020447-13	SO-1620-SSO14(0-2)-20200211	11 Feb 2020 10:00		13 Feb 2020 13:39	17 Feb 2020 15:00	1
HS20020447-14	SO-1620-SSO15(0-2)-20200211	11 Feb 2020 10:19		13 Feb 2020 13:39	17 Feb 2020 15:20	1
HS20020447-15	SO-1620-SSO02(0-2)-20200211	11 Feb 2020 11:00		13 Feb 2020 13:39	17 Feb 2020 15:39	1
HS20020447-16	SO-1620-FD01-20200210	10 Feb 2020 00:00		13 Feb 2020 13:39	17 Feb 2020 16:36	10
HS20020447-17	SO-1620-FD02-20200211	11 Feb 2020 00:00		13 Feb 2020 13:39	17 Feb 2020 16:17	1

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020447

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R356459 (0)	**Test Name :** MOISTURE - ASTM D2216				**Matrix:** Soil	
HS20020447-01	SO-1620-SSO01(0-2)-20200210	10 Feb 2020 13:10			17 Feb 2020 10:27	1
HS20020447-02	SO-1620-SSO03(0-2)-20200210	10 Feb 2020 13:40			17 Feb 2020 10:27	1
HS20020447-03	SO-1620-SSO04(0-2)-20200210	10 Feb 2020 13:50			17 Feb 2020 10:27	1
HS20020447-04	SO-1620-SSO06(0-2)-20200210	10 Feb 2020 14:00			17 Feb 2020 10:27	1
HS20020447-05	SO-1620-SSO07(0-2)-20200210	10 Feb 2020 14:10			17 Feb 2020 10:27	1
HS20020447-06	SO-1620-SSO08(0-2)-20200210	10 Feb 2020 14:20			17 Feb 2020 10:27	1
HS20020447-07	SO-1620-SSO09(0-2)-20200210	10 Feb 2020 14:30			17 Feb 2020 10:27	1
HS20020447-08	SO-1620-SSO10(0-2)-20200210	10 Feb 2020 14:45			17 Feb 2020 10:27	1
HS20020447-09	SO-1620-SSO05(0-2)-20200211	11 Feb 2020 09:25			17 Feb 2020 10:27	1
HS20020447-10	SO-1620-SSO11(0-2)-20200211	11 Feb 2020 09:40			17 Feb 2020 10:27	1
HS20020447-11	SO-1620-SSO12(0-2)-20200211	11 Feb 2020 09:45			17 Feb 2020 10:27	1
HS20020447-12	SO-1620-SSO13(0-2)-20200211	11 Feb 2020 09:50			17 Feb 2020 10:27	1
HS20020447-13	SO-1620-SSO14(0-2)-20200211	11 Feb 2020 10:00			17 Feb 2020 10:27	1
HS20020447-14	SO-1620-SSO15(0-2)-20200211	11 Feb 2020 10:19			17 Feb 2020 10:27	1
HS20020447-15	SO-1620-SSO02(0-2)-20200211	11 Feb 2020 11:00			17 Feb 2020 10:27	1
HS20020447-16	SO-1620-FD01-20200210	10 Feb 2020 00:00			17 Feb 2020 10:27	1
HS20020447-17	SO-1620-FD02-20200211	11 Feb 2020 00:00			17 Feb 2020 10:27	1

WorkOrder: HS20020447
InstrumentID: SV-7
Test Code: 8270_LOW_S
Test Number: SW8270
Test Name: Low-Level Semivolatiles by 8270D

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Pentachlorophenol	87-86-5	0.0033	0.0025	0.0033	0.0066
S	2,4,6-Tribromophenol	118-79-6	0	0	0	0
S	2-Fluorobiphenyl	321-60-8	0	0	0	0
S	2-Fluorophenol	367-12-4	0	0	0	0
S	4-Terphenyl-d14	1718-51-0	0	0	0	0
S	Nitrobenzene-d5	4165-60-0	0	0	0	0
S	Phenol-d6	13127-88-3	0	0	0	0

WorkOrder: HS20020447
InstrumentID: SV-6
Test Code: 8270_LOW_S
Test Number: SW8270
Test Name: Low-Level Semivolatiles by 8270D

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Pentachlorophenol	87-86-5	0.0033	0.00021	0.0033	0.0066
S	2,4,6-Tribromophenol	118-79-6	0	0	0	0
S	2-Fluorobiphenyl	321-60-8	0	0	0	0
S	2-Fluorophenol	367-12-4	0	0	0	0
S	4-Terphenyl-d14	1718-51-0	0	0	0	0
S	Nitrobenzene-d5	4165-60-0	0	0	0	0
S	Phenol-d6	13127-88-3	0	0	0	0

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020447

QC BATCH REPORT

Batch ID: 150597 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

MBLK Sample ID: **MBLK-150597** Units: **ug/Kg** Analysis Date: **13-Feb-2020 16:22**
Client ID: Run ID: **SV-7_356280** SeqNo: **5473119** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Pentachlorophenol	U	6.6								
Surr: 2,4,6-Tribromophenol	*111*	*0*	*167*	*0*	*66.5*	*36 - 126*				
Surr: 2-Fluorobiphenyl	*128.7*	*0*	*167*	*0*	*77.1*	*43 - 125*				
Surr: 2-Fluorophenol	*91.39*	*0*	*167*	*0*	*54.7*	*37 - 125*				
Surr: 4-Terphenyl-d14	*146*	*0*	*167*	*0*	*87.4*	*32 - 125*				
Surr: Nitrobenzene-d5	*119.2*	*0*	*167*	*0*	*71.4*	*37 - 125*				
Surr: Phenol-d6	*99.27*	*0*	*167*	*0*	*59.4*	*40 - 125*				

LCS Sample ID: **LCS-150597** Units: **ug/Kg** Analysis Date: **13-Feb-2020 16:41**
Client ID: Run ID: **SV-7_356280** SeqNo: **5473120** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Pentachlorophenol	49	6.6	167	0	29.3	23 - 136				
Surr: 2,4,6-Tribromophenol	*105.5*	*0*	*167*	*0*	*63.2*	*36 - 126*				
Surr: 2-Fluorobiphenyl	*86.63*	*0*	*167*	*0*	*51.9*	*43 - 125*				
Surr: 2-Fluorophenol	*75.53*	*0*	*167*	*0*	*45.2*	*37 - 125*				
Surr: 4-Terphenyl-d14	*109.5*	*0*	*167*	*0*	*65.5*	*32 - 125*				
Surr: Nitrobenzene-d5	*117.4*	*0*	*167*	*0*	*70.3*	*37 - 125*				
Surr: Phenol-d6	*75*	*0*	*167*	*0*	*44.9*	*40 - 125*				

MS Sample ID: **HS20020501-02MS** Units: **ug/Kg** Analysis Date: **14-Feb-2020 12:00**
Client ID: Run ID: **SV-7_356313** SeqNo: **5473790** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Pentachlorophenol	77.31	6.6	166.6	0	46.4	23 - 136				
Surr: 2,4,6-Tribromophenol	*148.1*	*0*	*166.6*	*0*	*88.9*	*36 - 126*				
Surr: 2-Fluorobiphenyl	*147.3*	*0*	*166.6*	*0*	*88.5*	*43 - 125*				
Surr: 2-Fluorophenol	*77.89*	*0*	*166.6*	*0*	*46.8*	*37 - 125*				
Surr: 4-Terphenyl-d14	*144.9*	*0*	*166.6*	*0*	*87.0*	*32 - 125*				
Surr: Nitrobenzene-d5	*95.46*	*0*	*166.6*	*0*	*57.3*	*37 - 125*				
Surr: Phenol-d6	*86.77*	*0*	*166.6*	*0*	*52.1*	*40 - 125*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020447

QC BATCH REPORT

Batch ID: 150597 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

MSD Sample ID: **HS20020501-02MSD** Units: **ug/Kg** Analysis Date: **13-Feb-2020 19:13**
Client ID: Run ID: **SV-7_356280** SeqNo: **5473127** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Pentachlorophenol	94.05	6.6	166.4	0	56.5	23 - 136	77.31	19.5	30	
Surr: 2,4,6-Tribromophenol	*134.5*	*0*	*166.4*	*0*	*80.8*	*36 - 126*	*148.1*	*9.58*	*30*	
Surr: 2-Fluorobiphenyl	*134.9*	*0*	*166.4*	*0*	*81.1*	*43 - 125*	*147.3*	*8.77*	*30*	
Surr: 2-Fluorophenol	*102.5*	*0*	*166.4*	*0*	*61.6*	*37 - 125*	*77.89*	*27.2*	*30*	
Surr: 4-Terphenyl-d14	*141*	*0*	*166.4*	*0*	*84.8*	*32 - 125*	*144.9*	*2.73*	*30*	
Surr: Nitrobenzene-d5	*109.9*	*0*	*166.4*	*0*	*66.0*	*37 - 125*	*95.46*	*14.1*	*30*	
Surr: Phenol-d6	*74.37*	*0*	*166.4*	*0*	*44.7*	*40 - 125*	*86.77*	*15.4*	*30*	

The following samples were analyzed in this batch: HS20020447-01 HS20020447-02 HS20020447-03 HS20020447-04
HS20020447-05 HS20020447-06 HS20020447-07

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020447

QC BATCH REPORT

Batch ID: 150608 (0) **Instrument: SV-6** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

MBLK Sample ID: **MBLK-150608** Units: **ug/Kg** Analysis Date: **13-Feb-2020 17:29**
Client ID: Run ID: **SV-6_356229** SeqNo: **5472906** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Pentachlorophenol	U	6.6								
Surr: 2,4,6-Tribromophenol	*88.84*	*0*	*167*	*0*	*53.2*	*36 - 126*				
Surr: 2-Fluorobiphenyl	*127.4*	*0*	*167*	*0*	*76.3*	*43 - 125*				
Surr: 2-Fluorophenol	*101.9*	*0*	*167*	*0*	*61.0*	*37 - 125*				
Surr: 4-Terphenyl-d14	*123.1*	*0*	*167*	*0*	*73.7*	*32 - 125*				
Surr: Nitrobenzene-d5	*118.2*	*0*	*167*	*0*	*70.8*	*37 - 125*				
Surr: Phenol-d6	*88.12*	*0*	*167*	*0*	*52.8*	*40 - 125*				

LCS Sample ID: **LCS-150608** Units: **ug/Kg** Analysis Date: **13-Feb-2020 17:48**
Client ID: Run ID: **SV-6_356229** SeqNo: **5472907** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Pentachlorophenol	60.33	6.6	167	0	36.1	23 - 136				
Surr: 2,4,6-Tribromophenol	*108.6*	*0*	*167*	*0*	*65.0*	*36 - 126*				
Surr: 2-Fluorobiphenyl	*139.8*	*0*	*167*	*0*	*83.7*	*43 - 125*				
Surr: 2-Fluorophenol	*116.9*	*0*	*167*	*0*	*70.0*	*37 - 125*				
Surr: 4-Terphenyl-d14	*142.8*	*0*	*167*	*0*	*85.5*	*32 - 125*				
Surr: Nitrobenzene-d5	*127.2*	*0*	*167*	*0*	*76.2*	*37 - 125*				
Surr: Phenol-d6	*117.6*	*0*	*167*	*0*	*70.4*	*40 - 125*				

MS Sample ID: **HS20020449-01MS** Units: **ug/Kg** Analysis Date: **14-Feb-2020 11:51**
Client ID: Run ID: **SV-6_356287** SeqNo: **5473656** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Pentachlorophenol	10.9	6.6	166.7	0	6.54	23 - 136				S
Surr: 2,4,6-Tribromophenol	*66.74*	*0*	*166.7*	*0*	*40.0*	*36 - 126*				
Surr: 2-Fluorobiphenyl	*127.2*	*0*	*166.7*	*0*	*76.3*	*43 - 125*				
Surr: 2-Fluorophenol	*77.49*	*0*	*166.7*	*0*	*46.5*	*37 - 125*				
Surr: 4-Terphenyl-d14	*129.4*	*0*	*166.7*	*0*	*77.6*	*32 - 125*				
Surr: Nitrobenzene-d5	*107*	*0*	*166.7*	*0*	*64.2*	*37 - 125*				
Surr: Phenol-d6	*88.11*	*0*	*166.7*	*0*	*52.9*	*40 - 125*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020447

QC BATCH REPORT

Batch ID: 150608 (0) **Instrument: SV-6** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

MSD Sample ID: **HS20020449-01MSD** Units: **ug/Kg** Analysis Date: **14-Feb-2020 12:10**
Client ID: Run ID: **SV-6_356287** SeqNo: **5473657** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Pentachlorophenol	4.024	6.5	165	0	2.44	23 - 136	10.9	0	30	JS
Surr: 2,4,6-Tribromophenol	*U*	*0*	*165*	*0*	*0*	*36 - 126*	*66.74*	*200*	*30*	SR
Surr: 2-Fluorobiphenyl	*124.1*	*0*	*165*	*0*	*75.2*	*43 - 125*	*127.2*	*2.46*	*30*	
Surr: 2-Fluorophenol	*12.68*	*0*	*165*	*0*	*7.68*	*37 - 125*	*77.49*	*144*	*30*	SR
Surr: 4-Terphenyl-d14	*118.8*	*0*	*165*	*0*	*72.0*	*32 - 125*	*129.4*	*8.49*	*30*	
Surr: Nitrobenzene-d5	*106.2*	*0*	*165*	*0*	*64.4*	*37 - 125*	*107*	*0.758*	*30*	
Surr: Phenol-d6	*25.04*	*0*	*165*	*0*	*15.2*	*40 - 125*	*88.11*	*111*	*30*	SR

The following samples were analyzed in this batch: HS20020447-08 HS20020447-09 HS20020447-10 HS20020447-11 HS20020447-12 HS20020447-13 HS20020447-14 HS20020447-15 HS20020447-16 HS20020447-17

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020447

QC BATCH REPORT

Batch ID: **R356459 (0)** **Instrument:** **Balance1** **Method:** **MOISTURE - ASTM D2216**

DUP Sample ID: **HS20020447-17DUP** Units: **wt%** Analysis Date: **17-Feb-2020 10:27**
Client ID: **SO-1620-FD02-20200211** Run ID: **Balance1_356459** SeqNo: **5476913** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Percent Moisture	20.2	0.0100					20.7	2.44	20	

The following samples were analyzed in this batch:

HS20020447-01	HS20020447-02	HS20020447-03	HS20020447-04
HS20020447-05	HS20020447-06	HS20020447-07	HS20020447-08
HS20020447-09	HS20020447-10	HS20020447-11	HS20020447-12
HS20020447-13	HS20020447-14	HS20020447-15	HS20020447-16
HS20020447-17			

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: **HS20020447**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/Kg-dry	Milligrams per Kilogram- Dry weight corrected

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

Sample Receipt Checklist

Client Name: PBW
Work Order: HS20020447

Date/Time Received: **11-Feb-2020 14:40**
Received by: **PMG**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 11-Feb-2020 Date

Reviewed by: *Dane J. Wacasey* eSignature — 12-Feb-2020 Date

Matrices: **Soil**

Carrier name: **Client**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:213525/213524
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	0.2°C UC/C		IR # 25
Cooler(s)/Kit(s):	45623		
Date/Time sample(s) sent to storage:	02/11/2020 19:30		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page 1 of 2

COC ID: 213525

HS20020447

NV

Golder Associates Inc.
Houston TX-Wood Preserving Works

ALS Project Manager:

Customer Information		Project Information	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works
Work Order		Project Number	1620-12-Rev0 SR 92688
Company Name	Golder Associates Inc.	Bill To Company	Union Pacific Railroad- A/P
Send Report To	Patrick Marty	Invoice Attn	Accounts Payable
Address	2201 Double Creek Drive Suite 4004	Address	1400 Douglas Street Stop 0750
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Omaha NE 681790750
Phone	(512) 671-3434	Phone	
Fax	(512) 671-3446	Fax	
e-Mail Address	Patrick_Marty@golder.com	e-Mail Address	

A	8270_LOW_W (5632532 SVOC - Pentachlorophenol only)
B	MOIST_ASTM (5631931 Moisture%)
C	
D	
E	Per Golder MSA
F	
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	SO-1620-SS001(0-2)-20200210	2-10-20	1310	Soil	8	1	X	X									
2	SS003(0-2)		1340														
3	SS004(0-2)		1350														
4	SS006(0-2)		1400														
5	SS007(0-2)		1410														
6	SS008(0-2)		1420														
7	SS009(0-2)		1430														
8	SS010(0-2)		1445														
9	SS005(0-2)-20200211	2-11-20	925														
10	SS011(0-2)		940														

Sampler(s) Please Print & Sign: Blake Sokora Tim McSpadden

Shipment Method:

Required Turnaround Time: (Check Box) [X] STD 10 Wk Days [ ] 5 Wk Days [ ] 2 Wk Days [ ] 24 Hour [ ] Other

Results Due Date:

Relinquished by:	Blake Sokora	Date: 2-11-20	Time: 1440	Received by:	
Relinquished by:		Date:	Time:	Received by (Laboratory):	2/11/2020 14:40
Logged by (Laboratory):		Date:	Time:	Checked by (Laboratory):	

Notes: UPRR HWPW 1620-12

Cooler ID	Cooler Temp.
45623	0.2° C
	#25 2/11/20

QC Package: (Check One Box Below)
- [ ] Level II Std QC
- [ ] Level III Std QC/Raw Data
- [ ] Level IV SW846/CLP
- [ ] Other
- [X] TRRP Checklist
- [ ] TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note:
1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page 2 of 2

COC ID: 213524

HS20020447

, WV

Golder Associates Inc.

Houston TX-Wood Preserving Works

ALS Project Manager:

Customer Information		Project Information	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works
Work Order		Project Number	1620-12-Rev0 SR 92688
Company Name	Golder Associates Inc.	Bill To Company	Union Pacific Railroad- A/P
Send Report To	Patrick Marty	Invoice Attn	Accounts Payable
Address	2201 Double Creek Drive Suite 4004	Address	1400 Douglas Street Stop 0750
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Omaha NE 681790750
Phone	(512) 671-3434	Phone	
Fax	(512) 671-3446	Fax	
e-Mail Address	Patrick_Marty@golder.com	e-Mail Address	

A: 8270_LOW_W (5632532 SVOC - Pentachlorophenol only)

B: MOIST_ASTM (5631931 Moisture%)

C:

D:

E: Per Golder

F: MSA

G:

H:

I:

J:

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	SO-1620-SS012(0-2)-20200211	2-11-20	945	Soil	8	1	X	X									
2	SS013(0-2)		950				X	X									
3	SS014(0-2)		1000				X	X									
4	SS015(0-2)		1019				X	X									
5	SS002(0-2)		1100				X	X									
6	FD01-20200210	—	—				X	X									
7	FD02-20200211	—	—				X	X									
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Blake Sokora Tim McSpadden

Shipment Method:

Required Turnaround Time: (Check Box) [X] STD 10 Wk Days [ ] 5 Wk Days [ ] 2 Wk Days [ ] 24 Hour [ ] Other

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Blake Sokora	2-11-20	1440	
Relinquished by:	Date:	Time:	Received by (Laboratory): 2/11/2020 14:40
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: UPRR HWPW 1620-12

Cooler ID	Cooler Temp.

QC Package: (Check One Box Below)

- [ ] Level II Std QC
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- [ ] Level IV SW846/CLP
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