February 14, 2023 Project No. 19119232

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

UPDATED BASELINE SOIL ASSESSMENT - UNION PACIFIC RAILROAD ENGLEWOOD INTERMODAL YARD, HOUSTON, TEXAS, POST-CLOSURE CARE PERMIT NO. HW-50343; INDUSTRIAL SWR NO. 31547

Dear Ms. Hatfield,

WSP USA Inc. (WSP), on behalf of Union Pacific Railroad Company (UPRR), is providing this letter report summarizing the additional sampling activities conducted as part of the baseline soil assessment (BSA) within the Englewood Intermodal Yard (EIY or the Site) (IHW Permit 50343). The previous sampling results of the BSA were provided to the Texas Commission on Environmental Quality (TCEQ) in the following letters:

- Baseline Soil Assessment - Union Pacific Railroad Englewood Intermodal Yard, Houston, Texas, Post-Closure Care Permit No. HW-50343; Industrial SWR No. 31547 dated September 19, 2022, and
- Updated Baseline Soil Assessment - Union Pacific Railroad Englewood Intermodal Yard, Houston, Texas, Post-Closure Care Permit No. HW-50343; Industrial SWR No. 31547 dated December 2, 2022.

Based on the analytical results of the soil samples collected in August and October 2022 detailed in the letters above, arsenic concentrations were not delineated along the southern property boundary to the applicable Texas Risk Reduction Program (TRRP) residential assessment levels (RALs) in surface soils at one location (BLS-26 (7.5-10)). As a result, UPRR proposed to collect additional soil samples along the southern property boundary near soil boring BLS-26 to further evaluate the lateral and vertical extent of the arsenic concentrations to the applicable RAL. The results from the additional sampling conducted in December 2022 are discussed below.

ADDITIONAL SAMPLING FOR BASELINE SOIL ASSESSMENT

Two additional soil borings (BLS-30 and BLS-31) were advanced (**Figure 1**) approximately 15 feet southwest and southeast, respectively from soil boring BLS-26. Three soil samples were collected at each location on December 15, 2022. Soil borings were advanced using a track-mounted direct-push technology (DPT) rig to a depth of 15 feet below ground surface (bgs). Soil samples were collected from the soil cores, field screened using a photoionization detector (PID), and visually logged using the United States Soil Classification System (USCS). Prior to sampling, the PID was calibrated using 100 parts per million (ppm) by volume isobutylene standard. As detailed in the December 2, 2022 letter, soil samples were collected from 0 to 2.5 feet bgs, from 7.5 to 10 feet bgs, and from 12.5 to 15 feet bgs (between 10 feet bgs and the top of the saturated zone (A-TZ) for vertical delineation in this area).

Soils encountered generally consisted of gravel and sand fill from ground surface to about 2 feet below grade overlying brown to gray silty clay to the base of each boring with occasional thin (less than 0.5 feet thick) gravel

WSP USA Inc.
16200 Park Row #200 Houston, Texas, USA 77084 T: +1 281 821 6868

seams or lenses. Saturated conditions were not encountered in the top 15 feet in borings BLS-30 or BLS-31. No field PID headspace exceeded background in the soils sampled in December 2022.

Soil samples collected from the assessment were analyzed for arsenic using the SW-846 Method 6020. Samples were collected in laboratory-supplied containers and placed on wet ice in an insulated cooler to reduce and maintain sample temperature at 4 ±2 degrees Celsius. Soil sample BLS-30 (12.5-15) was further analyzed for arsenic concentrations using the synthetic precipitation leaching procedure (SPLP) by EPA Test Method 1312 (SPLP extraction) and EPA Method 6020 (arsenic analysis of the extract). A chain-of custody record accompanied the samples through receipt at the ALS Environmental Laboratory in Houston, Texas. The data usability summary prepared by GHD and the laboratory analytical report for soil samples are provided in Attachment A.

Soil borings were plugged with bentonite chips in accordance with the State of Texas regulations. Investigation derived wastes (IDW), consisting of soil cuttings from drilling and decontamination fluids, were placed inside a labeled 55-gallon steel drum that was staged at a secure location on-site. IDW was profiled and disposed of in accordance with state and federal rules and regulations.

DATA EVALUATION

WSP evaluated the soil data by comparing the analytical results to TRRP residential Tier 1 and/or site-specific Tier 2 PCLs (last revised: March 2022), where applicable. Tier 1 PCLs used were based on the TCEQ TRRP Tier 1 residential Soil PCLs conservatively assuming a 30-acre source area. The RALs are derived from the lower concentration of the TRRP Tier 1 residential Total Soil Combined ($^{Tot}Soil_{Comb}$) and Tier 1 or Tier 2 Soil-to-Groundwater Ingestion ($^{GW}Soil_{Ing}$) PCLs. In the event the published Texas-Specific Background Concentration (TSBC) values for metals are higher than the residential PCL, the TSBC is used as the applicable RAL. Tier 2 PCLs used for this evaluation were from the PCLs developed and presented in the Affected Property Assessment Report (APAR) dated October 15, 2010 (PBW, 2010). For the soil-to-groundwater pathway evaluation, arsenic concentrations from the SPLP analysis were compared to the arsenic Tier 1 Residential groundwater ingestion pathway PCL ($^{GW}GW_{Ing}$=0.01 mg/L).

Soil Analytical Results

An updated summary of the soil analytical results for the previous sampling events and the samples collected in December 2022 is provided on Table 1. Arsenic results are presented on **Figure 2** and described below:

Residential $^{Tot}Soil_{Comb}$ PCL Evaluation

Arsenic concentrations in soil samples collected as part of the baseline assessment do no exceed the residential $^{Tot}Soil_{Comb}$ PCL (24 mg/kg).

Soil-to-Groundwater Pathway

Based on the previous sampling events, six soil samples collected as part of the BSA had arsenic concentrations greater than the Tier 2 $^{GW}Soil_{Ing}$ PCL (5.9 mg/kg). Of the six additional soil samples collected from the two soil borings in December 2022 near the south perimeter of the area for delineation, one of the samples (BLS-30 (12.5-15)) exceeded the Tier 2 $^{GW}Soil_{Ing}$ PCL with a concentration of 7.38 mg/kg (Table 1).

As stated in previous BSA letters (September 2022 and December 2022), lines of evidence indicate that the soil arsenic concentrations are protective of the uppermost A-Transmissive Zone (ATZ) groundwater bearing unit. This is supported by the arsenic concentrations detected in groundwater samples collected from nearby A-Transmissive Zone (ATZ) monitoring wells MW-51A and MW-97A (Figure 2) being below the Tier 1 Residential $^{GW}GW_{Ing}$ PCL (0.01 mg/L). However, to further evaluate the soil-to-groundwater pathway, soil sample BLS-30

(12.5-15)) was analyzed for potential leachability for arsenic using the SPLP extract from the soil sample. The arsenic SPLP result for BLS-30 (12.5-15) was 0.00415 mg/L with a J qualifier indicating the concentration was estimated and below the sample quantitation limit. The arsenic SPLP result for BLS-30 (12.5-15) is an order of magnitude below the Tier 1 Residential $^{GW}GW_{Ing}$ PCL of 0.01 mg/L, therefore supporting that the soil concentration (7.38 mg/kg) is protective of the shallow groundwater.

The 30 TAC §350.75(i)(7)(C) rule states that a determination that soils are protective and will attain the soil response objectives for groundwater protection shall be based on lines of evidence such as release information and soil sample data, groundwater data, and appropriate leachate results. Using the weight-of-evidence approach detailed above demonstrates that the existing arsenic concentrations in soils attain the soil response objectives for groundwater protection in this area.

Based on this evaluation, the arsenic concentrations in soils in the area including the concentration detected near the south property boundary at BLS-30 are considered protective of the shallow groundwater, and thereby are delineated to the appropriate assessment level per 30 TAC §350.75(i)(7)(A).

CONCLUSIONS

The additional investigation activities for the baseline soil assessment were conducted to evaluate the lateral and vertical extent of arsenic concentrations to applicable RALs in the soils at the Site. Based on the analytical results of the additional soil sampling conducted in December 2022, one soil sample (BLS-30 (12.5-15)) of the additional six samples collected had an arsenic concentration (7.38 mg/kg) that exceeded the Tier 2 $^{GW}Soil_{Ing}$ PCL of 5.9 mg/kg. Arsenic concentrations in all soil samples collected as part of the BSA did not exceed the residential $^{Tot}Soil_{Comb}$ PCL (24 mg/kg). Sample BLS-30 (12.5-15) was further analyzed for potential leachability for arsenic using the SPLP extract, and the result (0.00415J mg/L) is an order of magnitude below the Tier 1 Residential $^{GW}GW_{Ing}$ PCL of 0.01 mg/L. Based on multiple lines of evidence, including the SPLP result and absence of arsenic in groundwater in nearby wells, the arsenic concentrations in soils in the area are considered protective of the shallow groundwater and thereby are delineated to the appropriate assessment level.

RESPONSE ACTIONS

As detailed in the September 19, 2022 Baseline Soil Assessment letter, only two soil samples collected in this area of the EIY as part of this BSA had detected concentrations that exceeded their respective Residential $^{Tot}Soil_{Comb}$ PCLs: soil sample BLS-09(2-3.5) with total petroleum hydrocarbon (TPH) concentrations at 6,900 mg/kg and one soil sample BLS-10(0-2.5) with lead concentrations at 797 mg/kg. Neither of these concentrations exceed their respective commercial/industrial $^{Tot}Soil_{Comb}$ PCLs. As a result, the proposed response action for the Houston Wood Preserving Works site of a land use restriction for commercial/industrial land use and restricting future use of groundwater on-site through filing a deed recordation as detailed in the Response Action Plan (Revision 5, August 2020) Worksheet 2.0 is appropriate to satisfy the response action objectives for this area of the EIY. Therefore, no modifications or revisions are necessary to the current Response Action Plan for the Houston Wood Preserving Works site.

If you have any questions or need additional information, please feel free to call me at (512) 671-3434 or Mr. Kevin Peterburs of UPRR at (414) 267-4164.

Sincerely,

WSP USA Inc.

Michelle Hermiston, P.G.
Lead Consultant, Geologist

Eric C. Matzner, P.G.
Vice President - Director, Hydrogeologist

Attachments: Table 1: Analytical Data
Figure 1: Soil Boring Location Map
Figure 2: Subsurface Soil Arsenic Concentration Map

TABLE

Table 1
Baseline Soil Assessment
Union Pacific Railroad - Englewood Intermodal Yard; Schneider Lease Property
Houston, TX

Location ID	TRRP Tier 1 or 2 Residential PCLs*		TRRP Tier 1 or 2 Commercial/Industrial PCLs		Texas Specific Background Concentration	BLS-01	BLS-01	BLS-02	BLS-02	BLS-03	BLS-03	BLS-04	BLS-04	BLS-05	BLS-05	BLS-06	BLS-06	BLS-07	BLS-07	BLS-08	BLS-08	BLS-09	BLS-09	BLS-10	BLS-10	BLS-10	BLS-11
Sample Interval						0-2.5	7.5-10	0-2.5	7.5-10	0-2.5	6.5-8	0-2.5	7.5-10	0-2.5	7.5-10	0-2.5	7.5-10	0-2.5	7.5-10	0-2.5	7.5-10	2-3.5	7.5-10	0-2.5	7.5-10	12.5-15	0-2.5
Sample Date	$^{Tot}Soil_{Comb}$	$^{GW}Soil_{Ing}$	$^{Tot}Soil_{Comb}$	$^{GW}Soil_{Ing}$		8/22/2022	8/22/2022	8/22/2022	8/22/2022	8/22/2022	8/22/2022	8/22/2022	8/22/2022	8/22/2022	8/22/2022	8/22/2022	8/22/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	10/11/2022	8/23/2022
Constituent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Metals																											
Arsenic	24	2.5	200	2.5	5.9	**2.65**	**0.905**	**1.66**	**0.656**	**3.73**	**0.721**	**1.55**	**0.442 J**	**1.16**	**0.234 J**	**2.84**	**1.42**	**3.4**	**1.67**	**0.783**	**0.808**	**9.61**	**1.01**	**3.26**	**9.29**	**0.658**	**3.99**
*Arsenic SPLP (mg/L)**	NA	NA	NA	NA	NA	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Lead	500	275	1600	275	15	**43.7**	**7**	**13.3**	**6.85**	**15.4**	**6.17**	**9.59**	**3.75**	**8.76**	**4.31**	**31**	**6.2**	**48.4**	**8.92**	**14.8**	**12**	**162**	**6.64**	**797**	**12.6**	NM	**286**
Volatile Organic Compounds																											
1,2 Dichloroethane	30	0.031	71	0.031	NA	< 0.00059	< 0.00055	< 0.0006	< 0.00063	< 0.00055	< 0.00057	< 0.00057	< 0.00054	< 0.00057	< 0.00057	< 0.00077	< 0.00054	< 0.00058	< 0.00057	< 0.00053	< 0.00059	< 0.00064	< 0.00054	< 0.00048	< 0.00055	NM	< 0.00096
Benzene	69	0.1	130	0.1	NA	< 0.00049	< 0.00046	< 0.0005	< 0.00052	< 0.00046	< 0.00048	< 0.00047	< 0.00045	< 0.00047	< 0.00048	< 0.00064	< 0.00045	< 0.00049	< 0.00047	< 0.00045	< 0.0005	< 0.00053	< 0.00045	< 0.0004	< 0.00046	NM	< 0.0008
Chlorobenzene	320	6.5	540	6.5	NA	< 0.00059	< 0.00055	< 0.0006	< 0.00063	< 0.00055	< 0.00057	< 0.00057	< 0.00054	< 0.00057	< 0.00057	< 0.00077	< 0.00054	< 0.00058	< 0.00057	< 0.00053	< 0.00059	< 0.00064	< 0.00054	< 0.00048	< 0.00055	NM	< 0.00096
Ethylbenzene	5300	44	17000	44	NA	< 0.00069	< 0.00064	< 0.0007	< 0.00073	< 0.00065	< 0.00067	< 0.00066	< 0.00063	< 0.00066	< 0.00067	< 0.0009	< 0.00063	< 0.00068	< 0.00066	< 0.00062	< 0.00069	< 0.00074	< 0.00063	< 0.00057	< 0.00065	NM	< 0.0011
Methylene chloride	1500	0.022	8600	0.021	NA	< 0.00099	< 0.00092	< 0.001	< 0.001	< 0.00092	< 0.00096	< 0.00095	< 0.0009	< 0.00095	< 0.00095	< 0.0013	< 0.0009	< 0.00097	< 0.00095	< 0.00089	< 0.00099	< 0.0011	< 0.0009	< 0.00081	< 0.00092	NM	< 0.0016
Toluene	5400	43	29000	43	NA	< 0.00059	< 0.00055	< 0.0006	< 0.00063	< 0.00055	< 0.00057	< 0.00057	< 0.00054	< 0.00057	< 0.00057	< 0.00077	< 0.00054	< 0.00058	< 0.00057	< 0.00053	< 0.00059	< 0.00064	< 0.00054	< 0.00048	< 0.00055	NM	< 0.00096
Xylenes, Total	3700	730	6500	730	NA	< 0.00099	< 0.00092	< 0.001	< 0.001	< 0.00092	< 0.00096	< 0.00095	< 0.0009	< 0.00095	< 0.00095	< 0.0013	< 0.0009	< 0.00097	< 0.00095	< 0.00089	< 0.00099	< 0.0011	< 0.0009	< 0.00081	< 0.00092	NM	< 0.0016
Semi-Volatile Organic Compounds																											
1,2-Diphenylhydrazine	5.4	0.23	20	0.51	NA	<0.014	<0.0014	<0.0013	<0.0014	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.012	<0.0013	<0.013	<0.0013	<0.063	<0.066	<0.013	<0.0013	<0.013	<0.064	NM	<0.013
2,4-Dimethylphenol	1300	18	14000	53	NA	<0.041	<0.0041	<0.0039	<0.0041	<0.0038	<0.0040	<0.0038	<0.0038	<0.0038	<0.0038	<0.037	<0.0039	<0.039	<0.0040	<0.19	<0.20	<0.038	<0.0039	<0.038	<0.19	NM	<0.040
2,4-Dinitrotoluene	6.9	0.022	28	0.049	NA	<0.011	<0.0011	<0.0011	<0.0011	<0.0010	<0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0011	<0.011	<0.0011	<0.051	<0.054	<0.010	<0.0011	<0.010	<0.053	NM	<0.011
2,6-Dinitrotoluene	6.9	0.018	28	0.04	NA	<0.041	<0.0041	<0.0039	<0.0041	<0.0038	<0.0040	<0.0038	<0.0038	<0.0038	<0.0038	<0.037	<0.0039	<0.039	<0.0040	<0.19	<0.20	<0.038	<0.0039	<0.038	<0.19	NM	<0.040
2-Chloronaphthalene	5000	5000	50000	15000	NA	<0.016	<0.0016	<0.0015	<0.0016	<0.0015	<0.0016	<0.0015	<0.0015	<0.0015	<0.0015	<0.015	<0.0015	<0.016	<0.0016	<0.074	<0.079	<0.015	<0.0015	<0.015	<0.076	NM	<0.016
2-Methylnaphthalene	250	130	2500	380	NA	<0.0062	<0.00063	<0.00059	<0.00062	**0.0024 J**	<0.00061	**0.0022 J**	<0.00057	**0.0021 J**	<0.00058	<0.0057	<0.00059	<0.0060	<0.00060	<0.028	<0.030	**0.37**	<0.00059	**0.059**	<0.029	NM	**0.13**
4,6-Dinitro-2-methylphenol	6.7	0.0021	68	0.54	NA	<0.026	<0.0026	<0.0025	<0.0026	<0.0024	<0.0026	<0.0024	<0.0024	<0.0024	<0.0024	<0.024	<0.0025	<0.025	<0.0025	<0.12	<0.13	<0.024	<0.0025	<0.024	<0.12	NM	<0.026
4-Nitrophenol	130	0.089	1400	0.27	NA	<0.024	<0.0024	<0.0023	<0.0024	<0.0022	<0.0023	<0.0022	<0.0022	<0.0022	<0.0022	<0.022	<0.0023	<0.023	<0.0023	<0.11	<0.11	<0.022	<0.0022	<0.022	<0.11	NM	<0.023
Acenaphthene	3000	1800	37000	5200	NA	<0.0062	<0.00063	<0.00059	<0.00062	<0.00058	<0.00061	<0.00058	<0.00057	<0.00058	<0.00058	<0.0057	<0.00059	<0.0060	<0.00060	<0.028	<0.030	**0.45**	<0.00059	**0.038**	<0.029	NM	**0.11**
Acenaphthylene	3800	3000	37000	9100	NA	<0.012	<0.0013	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0011	<0.0012	<0.0012	<0.011	<0.0012	<0.012	<0.0012	<0.057	<0.060	<0.012	<0.0012	**0.015 J**	<0.058	NM	<0.012
Anthracene	18000	3400	190000	10000	NA	<0.0062	<0.00063	<0.00059	<0.00062	<0.00058	<0.00061	<0.00058	<0.00057	<0.00058	<0.00058	**0.014 J**	<0.00059	**0.0080 J**	<0.00060	<0.028	<0.030	**0.51**	**0.00089 J**	**0.28**	<0.029	NM	**0.78**
Benz(a)anthracene	41	130	170	300	NA	<0.020	<0.0020	<0.0019	<0.0020	**0.0032 J**	<0.0019	<0.0019	<0.0018	**0.0023 J**	<0.0019	**0.026 J**	**0.0031 J**	**0.044**	<0.0019	<0.091	<0.097	**0.34**	<0.0019	**0.13**	<0.093	NM	**0.12**
Benzo(a)pyrene	4.1	57	17	57	NA	<0.012	<0.0013	<0.0012	<0.0012	<0.0012	<0.0012	**0.0026 J**	<0.0011	<0.0012	<0.0012	<0.011	**0.0028 J**	**0.033 J**	<0.0012	<0.057	<0.060	<0.012	<0.0012	**0.16**	<0.058	NM	**0.12**
Bis(2-chloroethoxy)methane	2.5	0.077	6.2	0.17	NA	<0.011	<0.0011	<0.0011	<0.0011	<0.0010	<0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0011	<0.011	<0.0011	<0.051	<0.054	<0.010	<0.0011	<0.010	<0.053	NM	<0.011
Bis(2-ethylhexyl)phthalate	43	1200	560	1200	NA	<0.021	**0.0056 J**	<0.0020	**0.0040 J**	**0.0094**	**0.0060 J**	**0.0074 J**	**0.0041 J**	**0.013**	**0.0069 J**	<0.019	**0.013**	**0.21**	**0.0027 J**	<0.097	<0.10	**0.22**	**0.0038 J**	**0.17**	<0.099	NM	**0.036 J**
Chrysene	4100	12000	17000	26000	NA	<0.010	<0.0010	<0.00095	<0.0010	**0.0021 J**	<0.00097	<0.00093	<0.00092	**0.0027 J**	<0.00093	**0.023 J**	**0.0032 J**	**0.043**	<0.00097	<0.046	<0.048	**0.28**	<0.00094	**0.13**	<0.047	NM	**0.12**
Dibenzofuran	270	250	2700	740	NA	<0.0087	<0.00088	<0.00083	<0.00087	<0.00082	<0.00085	<0.00081	<0.00080	<0.00081	<0.00081	<0.0079	<0.00083	<0.0084	<0.00085	<0.040	<0.042	<0.0081	<0.00082	**0.037 J**	<0.041	NM	**0.059**
Di-n-butyl phthalate	6200	25000	68000	74000	NA	<0.015	**0.0040 J**	<0.0014	<0.0015	<0.0014	**0.0047 J**	<0.0014	**0.0026 J**	<0.0014	<0.0014	<0.014	<0.0014	<0.014	<0.0015	<0.068	<0.073	<0.014	<0.0014	<0.014	<0.070	NM	<0.015
Fluoranthene	2300	14000	25000	43000	NA	<0.014	<0.0014	**0.0030 J**	<0.0014	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	**0.069**	<0.0013	**0.077**	<0.0013	<0.063	<0.066	**1.4**	**0.0017 J**	**0.35**	<0.064	NM	**0.38**
Fluorene	2300	2200	25000	6600	NA	<0.014	<0.0014	<0.0013	<0.0014	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.012	<0.0013	<0.013	<0.0013	<0.063	<0.066	**0.34**	<0.0013	**0.083**	<0.064	NM	**0.14**
Naphthalene	120	230	190	680	NA	<0.0075	<0.00075	<0.00071	<0.00075	<0.00070	<0.00073	<0.00070	<0.00069	<0.00070	<0.00070	<0.0068	<0.00071	<0.0072	<0.00073	**0.047 J**	**0.054 J**	**0.095**	<0.00071	**0.047**	<0.035	NM	**0.078**
Nitrobenzene	34	0.49	57	1.5	NA	<0.011	<0.0011	<0.0011	<0.0011	<0.0010	<0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0011	<0.011	<0.0011	<0.051	<0.054	<0.010	<0.0011	<0.010	<0.053	NM	<0.011
N-Nitrosodiphenylamine	570	19	1900	42	NA	<0.0087	<0.00088	<0.00083	<0.00087	<0.00082	<0.00085	<0.00081	<0.00080	<0.00081	<0.00081	<0.0079	<0.00083	<0.0084	<0.00085	<0.040	<0.042	<0.0081	<0.00082	<0.0080	<0.041	NM	**0.015 J**
Pentachlorophenol	0.73	0.12	32	0.12	NA	<0.041	<0.0041	<0.0039	<0.0041	<0.0038	<0.0040	<0.0038	<0.0038	<0.0038	<0.0038	<0.037	<0.0039	<0.039	<0.0040	<0.19	<0.20	<0.038	<0.0039	<0.038	<0.19	NM	<0.040
Phenanthrene	1700	3100	19000	9300	NA	<0.019	<0.0019	<0.0018	<0.0019	<0.0017	<0.0018	<0.0017	**0.0024 J**	<0.0017	**0.028**	**0.025 J**	**0.039**	**0.033 J**	<0.0018	<0.085	<0.091	**0.98**	**0.0069**	**0.34**	<0.088	NM	**0.46**
Phenol	950	45	1400	130	NA	<0.014	<0.0014	<0.0013	<0.0014	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.012	<0.0013	<0.013	<0.0013	<0.063	<0.066	<0.013	<0.0013	<0.013	<0.064	NM	**0.94**
Pyrene	1700	8400	19000	25000	NA	<0.0075	<0.00075	**0.0027 J**	<0.00075	<0.00070	<0.00073	<0.00070	<0.00069	<0.00070	<0.00070	**0.055**	<0.00071	**0.061**	<0.00073	<0.034	<0.036	**1.3**	**0.0014 J**	**0.36**	<0.035	NM	**0.35**
Total Petroleum Hydrocarbon																											
nC6 to nC12	---	---	---	---	NA	<8.8	<7.4	<7.9	<7.9	<7.4	<7.1	<7.2	<6.9	<7.2	<7.0	<7.9	<7.2	<7.3	<7.1	<6.6	<7.3	<69	<6.8	<6.9	<6.7	NM	<12
>nC12 to nC28	---	---	---	---	NA	<12	<9.7	<10	<10	<9.8	<9.3	<9.4	<9.1	<9.5	<9.3	**21 J**	<9.5	<9.7	<9.4	<8.7	<9.6	**4100**	<9.0	**220**	<8.8	NM	**160**
>nC28 to nC35	---	---	---	---	NA	<12	<9.7	<10	<10	<9.8	<9.3	<9.4	<9.1	<9.5	<9.3	**49 J**	<9.5	<9.7	<9.4	<8.7	<9.6	**2800**	<9.0	**230**	<8.8	NM	**230**
Total Petroleum Hydrocarbon	5,797	NC	58000	NC	NA	<8.8	<7.4	<7.9	<7.9	<7.4	<7.1	<7.2	<6.9	<7.2	<7.0	**70**	<7.2	<7.3	<7.1	<6.6	<7.3	**6900**	<6.8	**450**	<6.7	NM	**390**

Notes:

(1) Concentrations were compared to the lower of the TotSoilcomb and GWSoilIng TCEQ TRRP Tier 1 or Tier 2 Residential Soil PCLs (30 acre source area) (March 2022). Tier 2 calculations were presented in the Affected Property Assessment Report (APAR) dated October 15, 2010 (PBW, 2010).

(2) Metal concentrations were compared to the higher of the TRRP Tier 1 PCL and the Texas-Specific Background Concentrations (TSBC).

(3) Lead concentrations were compared to TRRP Tier 2 PCLs based on the formula and default values presented in TCEQ Guidance Document Establishing Critical Protective Concentration Levels (PCLs) for Lead-Affected Soils (TCEQ, August 2001).

(4) Constituent detections above the sample detection limit (SDL) have been bolded.

(5) Concentrations exceeding the RAL are highlighted yellow. The applicable action level is highlighted gray.

(6) J = Analyte detected below the quantitation limit.

(7) TPH PCL based on TPH mixture PCL for an unresolved complex mixture (UCM) as detailed in the Interim NAPL and TPH-NAPL Assessment Report (Golder, 2020).

(8) Arsenic SPLP results compared to TRRP Tier 1 $^{GW}GW_{ING}$ PCL (0.01 mg/L)

NC- Not Calculated - According to the TCEQ TRRP Tier 1 TPH PCL Calculator for TCEQ Method 1006 Data, the GW-Soil-Ing PCL not needed based on the Hazard Index (Golder, 2020).

NM- Not Measured

Table 1
Baseline Soil Assessment
Union Pacific Railroad - Englewood Intermodal Yard; Schneider Lease Property
Houston, TX

Location ID	TRRP Tier 1 or 2 Residential PCLs*		TRRP Tier 1 or 2 Commercial/Industrial PCLs		Texas Specific Background Concentration	BLS-11	BLS-12	BLS-12	BLS-12	BLS-13	BLS-13	BLS-14	BLS-14	BLS-15	BLS-15	BLS-16	BLS-16	BLS-17	BLS-17	BLS-18	BLS-18	BLS-19	BLS-19	BLS-20	BLS-20	BLS-21	BLS-21	BLS-22	BLS-22	BLS-23
Sample Interval						7.5-10	0-2.5	7.5-10	12.5-15	0-2.5	7.5-10	0-2.5	7.5-10	0-2.5	7.5-10	0-2.5	7.5-10	0-2.5	7.5-10	0-2.5	7.5-10	0-2.5	7.5-10	0-2.5	7.5-10	0-2.5	7.5-10	0-2.5	7.5-10	0-2.5
Sample Date	$^{Tot}Soil_{Comb}$	$^{GW}Soil_{Ing}$	$^{Tot}Soil_{Comb}$	$^{GW}Soil_{Ing}$		8/23/2022	8/23/2022	8/23/2022	10/11/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/24/2022	8/24/2022	8/24/2022	8/24/2022	8/24/2022
Constituent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Metals																														
Arsenic	24	2.5	200	2.5	5.9	**5.01**	**2.55**	**6.16**	**0.776**	**0.846**	**1.38**	**3.13**	**0.87**	**2.6**	**1.67**	**0.984**	**3.42**	**13.1**	**0.822**	**1.62**	**0.727**	**3.15**	**1.93**	**8.54**	**0.554**	**1.53**	**1.45**	**1.8**	**5.5**	**1.72**
*Arsenic SPLP (mg/L)**	NA	NA	NA	NA	NA	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Lead	500	275	1600	275	15	**8.91**	**190**	**12**	NM	**9.58**	**6.36**	**56.2**	**7.2**	**261**	**7.85**	**8.62**	**8.04**	**19.3**	**4.94**	**7.77**	**5.91**	**54.8**	**8.28**	**170**	**5.25**	**34.7**	**8.51**	**43**	**12.7**	**157**
Volatile Organic Compounds																														
1,2 Dichloroethane	30	0.031	71	0.031	NA	< 0.00054	< 0.00087	< 0.00055	NM	< 0.00047	< 0.00055	< 0.00054	< 0.00056	< 0.00038	< 0.00055	< 0.00055	< 0.00057	< 0.00056	< 0.00058	< 0.00055	< 0.00059	< 0.00068	< 0.00056	< 0.00079	< 0.00053	< 0.00073	< 0.00055	< 0.00053	< 0.00056	< 0.00064
Benzene	69	0.1	130	0.1	NA	< 0.00045	< 0.00073	< 0.00046	NM	< 0.00039	< 0.00046	< 0.00045	< 0.00047	< 0.00032	< 0.00046	< 0.00046	< 0.00048	< 0.00047	< 0.00048	< 0.00046	< 0.00049	< 0.00057	< 0.00047	< 0.00066	< 0.00045	< 0.00061	< 0.00046	< 0.00045	< 0.00047	< 0.00054
Chlorobenzene	320	6.5	540	6.5	NA	< 0.00054	< 0.00087	< 0.00055	NM	< 0.00047	< 0.00055	< 0.00054	< 0.00056	< 0.00038	< 0.00055	< 0.00055	< 0.00057	< 0.00056	< 0.00058	< 0.00055	< 0.00059	< 0.00068	< 0.00056	< 0.00079	< 0.00053	< 0.00073	< 0.00055	< 0.00053	< 0.00056	< 0.00064
Ethylbenzene	5300	44	17000	44	NA	< 0.00063	< 0.001	< 0.00064	NM	< 0.00055	< 0.00064	< 0.00064	< 0.00066	< 0.00044	< 0.00064	< 0.00064	< 0.00067	< 0.00066	< 0.00067	< 0.00064	< 0.00069	< 0.0008	< 0.00066	< 0.00092	< 0.00062	< 0.00085	< 0.00064	< 0.00062	< 0.00066	< 0.00075
Methylene chloride	1500	0.022	8600	0.021	NA	< 0.0009	< 0.0015	< 0.00091	NM	< 0.00078	< 0.00092	< 0.00091	< 0.00094	< 0.00064	< 0.00092	< 0.00091	< 0.00096	< 0.00094	< 0.00096	< 0.00092	< 0.00098	< 0.0011	< 0.00094	< 0.0013	< 0.00089	< 0.0012	< 0.00091	< 0.00089	< 0.00094	< 0.0011
Toluene	5400	43	29000	43	NA	< 0.00054	< 0.00087	< 0.00055	NM	< 0.00047	< 0.00055	< 0.00054	< 0.00056	< 0.00038	< 0.00055	< 0.00055	< 0.00057	< 0.00056	< 0.00058	< 0.00055	< 0.00059	< 0.00068	< 0.00056	< 0.00079	< 0.00053	< 0.00073	< 0.00055	< 0.00053	< 0.00056	< 0.00064
Xylenes, Total	3700	730	6500	730	NA	< 0.0009	< 0.0015	< 0.00091	NM	< 0.00078	< 0.00092	< 0.00091	< 0.00094	< 0.00064	< 0.00092	< 0.00091	< 0.00096	< 0.00094	< 0.00096	< 0.00092	< 0.00098	< 0.0011	< 0.00094	< 0.0013	< 0.00089	< 0.0012	< 0.00091	< 0.00089	< 0.00094	< 0.0011
Semi-Volatile Organic Compounds																														
1,2-Diphenylhydrazine	5.4	0.23	20	0.51	NA	<0.0013	<0.014	<0.0013	NM	<0.0013	<0.064	<1.3	<0.066	<1.3	<0.065	<0.063	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.013	<0.0013	<0.013	<0.0013	<0.013	<0.014	<0.013	<0.0013	<0.013
2,4-Dimethylphenol	1300	18	14000	53	NA	<0.0039	<0.041	<0.0040	NM	<0.0038	<0.19	<4.0	<0.20	<4.0	<0.20	<0.19	<0.0040	<0.0039	<0.0039	<0.0039	<0.0040	<0.038	<0.0039	<0.039	<0.0038	<0.039	<0.041	<0.040	<0.0038	<0.039
2,4-Dinitrotoluene	6.9	0.022	28	0.049	NA	<0.0011	<0.011	<0.0011	NM	<0.0010	<0.053	<1.1	<0.054	<1.1	<0.053	<0.052	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.010	<0.0011	<0.011	<0.0010	<0.011	<0.011	<0.011	<0.0010	<0.011
2,6-Dinitrotoluene	6.9	0.018	28	0.04	NA	<0.0039	<0.041	<0.0040	NM	<0.0038	<0.19	<4.0	<0.20	<4.0	<0.20	<0.19	<0.0040	<0.0039	<0.0039	<0.0039	<0.0040	<0.038	<0.0039	<0.039	<0.0038	<0.039	<0.041	<0.040	<0.0038	<0.039
2-Chloronaphthalene	5000	5000	50000	15000	NA	<0.0015	<0.016	<0.0016	NM	<0.0015	<0.076	<1.6	<0.078	<1.6	<0.077	<0.075	<0.0016	<0.0015	<0.0015	<0.0015	<0.0016	<0.015	<0.0015	<0.015	<0.0015	<0.015	<0.016	<0.016	<0.0015	<0.015
2-Methylnaphthalene	250	130	2500	380	NA	<0.00059	**0.020 J**	<0.00060	NM	<0.00058	<0.029	<0.61	<0.030	<0.60	<0.030	<0.029	<0.00060	<0.00059	<0.00059	<0.00059	<0.00061	<0.0057	<0.00059	**0.15**	<0.00057	<0.0059	<0.0062	<0.0060	<0.00058	<0.0059
4,6-Dinitro-2-methylphenol	6.7	0.0021	68	0.54	NA	<0.0025	<0.026	<0.0025	NM	<0.0024	<0.12	<2.6	<0.13	<2.5	<0.12	<0.12	<0.0025	<0.0025	<0.0025	<0.0025	<0.0026	<0.024	<0.0025	<0.025	<0.0024	<0.025	<0.026	<0.025	<0.0024	<0.025
4-Nitrophenol	130	0.089	1400	0.27	NA	<0.0022	<0.024	<0.0023	NM	<0.0022	<0.11	<2.3	<0.11	<2.3	<0.11	<0.11	<0.0023	<0.0023	<0.0023	<0.0022	<0.0023	<0.022	<0.0022	<0.022	<0.0022	<0.022	<0.023	<0.023	<0.0022	<0.022
Acenaphthene	3000	1800	37000	5200	NA	<0.00059	**0.033 J**	<0.00060	NM	<0.00058	<0.029	<0.61	<0.030	<0.60	<0.030	<0.029	<0.00060	<0.00059	<0.00059	<0.00059	<0.00061	<0.0057	<0.00059	**0.028 J**	<0.00057	<0.0059	<0.0062	<0.0060	<0.00058	<0.0059
Acenaphthylene	3800	3000	37000	9100	NA	<0.0012	<0.012	<0.0012	NM	<0.0012	<0.058	<1.2	<0.060	<1.2	<0.059	<0.058	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.011	<0.0012	<0.012	<0.0011	<0.012	<0.012	<0.012	<0.0012	<0.012
Anthracene	18000	3400	190000	10000	NA	<0.00059	**0.077**	<0.00060	NM	<0.00058	<0.029	<0.61	<0.030	<0.60	<0.030	<0.029	<0.00060	<0.00059	<0.00059	<0.00059	<0.00061	<0.0057	<0.00059	**0.086**	<0.00057	**0.0063 J**	<0.0062	<0.0060	<0.00058	<0.0059
Benz(a)anthracene	41	130	170	300	NA	<0.0019	**0.11**	<0.0019	NM	<0.0019	<0.093	<1.9	<0.097	<1.9	<0.095	<0.092	<0.0019	<0.0019	**0.0039 J**	<0.0019	<0.0019	<0.018	<0.0019	**0.054**	<0.0018	**0.028 J**	<0.020	<0.019	<0.0019	**0.020 J**
Benzo(a)pyrene	4.1	57	17	57	NA	<0.0012	**0.13**	<0.0012	NM	**0.0039**	<0.058	<1.2	<0.060	<1.2	<0.059	<0.058	<0.0012	<0.0012	**0.0020 J**	<0.0012	<0.0012	<0.011	<0.0012	**0.081**	<0.0011	**0.033 J**	<0.012	<0.012	<0.0012	<0.012
Bis(2-chloroethoxy)methane	2.5	0.077	6.2	0.17	NA	<0.0011	<0.011	<0.0011	NM	<0.0010	<0.053	<1.1	<0.054	<1.1	<0.053	<0.052	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.010	<0.0011	<0.011	<0.0010	<0.011	<0.011	<0.011	<0.0010	<0.011
Bis(2-ethylhexyl)phthalate	43	1200	560	1200	NA	**0.0038 J**	<0.021	**0.0039 J**	NM	**0.016**	<0.099	<2.1	<0.10	<2.1	<0.10	<0.098	**0.0028 J**	<0.0020	**0.0024 J**	<0.0020	**0.0091 J**	<0.020	<0.0020	<0.020	**0.0028 J**	<0.020	<0.021	<0.020	<0.0020	<0.020
Chrysene	4100	12000	17000	26000	NA	<0.00094	**0.09**	<0.00096	NM	<0.00093	<0.047	<0.97	<0.048	<0.97	<0.048	<0.046	**0.0017 J**	<0.00095	**0.0024 J**	<0.00094	<0.00097	<0.0092	<0.00095	**0.059**	<0.00091	**0.031 J**	<0.0099	<0.0096	<0.00093	<0.0095
Dibenzofuran	270	250	2700	740	NA	<0.00082	**0.017 J**	<0.00084	NM	<0.00081	<0.041	<0.85	<0.042	<0.85	<0.042	<0.040	<0.00084	<0.00083	<0.00083	<0.00082	<0.00085	<0.0080	<0.00083	**0.049**	<0.00080	<0.0083	<0.0086	<0.0084	<0.00082	<0.0083
Di-n-butyl phthalate	6200	25000	68000	74000	NA	**0.0022 J**	<0.015	**0.0025 J**	NM	**0.0026 J**	<0.070	<1.5	<0.072	<1.4	<0.071	<0.069	<0.0014	<0.0014	<0.0014	<0.0014	**0.0021 J**	<0.014	**0.0021 J**	<0.014	**0.0026 J**	<0.014	<0.015	<0.014	**0.0029 J**	<0.014
Fluoranthene	2300	14000	25000	43000	NA	<0.0013	**0.23**	**0.0015 J**	NM	<0.0013	<0.064	<1.3	<0.066	<1.3	<0.065	<0.063	**0.0024 J**	<0.0013	**0.0088**	<0.0013	<0.0013	<0.013	<0.0013	**0.15**	<0.0013	**0.049**	<0.014	<0.013	**0.0014 J**	**0.023 J**
Fluorene	2300	2200	25000	6600	NA	<0.0013	**0.028 J**	<0.0013	NM	<0.0013	<0.064	<1.3	<0.066	<1.3	<0.065	<0.063	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.013	<0.0013	**0.024 J**	<0.0013	<0.013	<0.014	<0.013	<0.0013	<0.013
Naphthalene	120	230	190	680	NA	<0.00070	**0.024 J**	<0.00072	NM	<0.00069	<0.035	<0.73	<0.036	<0.72	<0.036	<0.035	<0.00072	<0.00071	<0.00071	<0.00070	<0.00073	<0.0069	<0.00071	**0.06**	<0.00069	<0.0071	<0.0074	<0.0072	<0.00070	<0.0071
Nitrobenzene	34	0.49	57	1.5	NA	<0.0011	<0.011	<0.0011	NM	<0.0010	<0.053	<1.1	<0.054	<1.1	<0.053	<0.052	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.010	<0.0011	<0.011	<0.0010	<0.011	<0.011	<0.011	<0.0010	<0.011
N-Nitrosodiphenylamine	570	19	1900	42	NA	<0.00082	<0.0087	<0.00084	NM	<0.00081	<0.041	<0.85	<0.042	<0.85	<0.042	<0.040	<0.00084	<0.00083	<0.00083	<0.00082	<0.00085	<0.0080	<0.00083	<0.0082	<0.00080	<0.0083	<0.0086	<0.0084	<0.00082	<0.0083
Pentachlorophenol	0.73	0.12	32	0.12	NA	<0.0039	<0.041	<0.0040	NM	<0.0038	<0.19	<4.0	<0.20	<4.0	<0.20	<0.19	<0.0040	<0.0039	<0.0039	<0.0039	<0.0040	<0.038	<0.0039	<0.039	<0.0038	<0.039	<0.041	<0.040	<0.0038	<0.039
Phenanthrene	1700	3100	19000	9300	NA	<0.0018	**0.17**	**0.0019 J**	NM	<0.0017	<0.088	<1.8	<0.091	<1.8	<0.089	<0.086	<0.0018	<0.0018	**0.0051**	<0.0018	<0.0018	<0.017	<0.0018	**0.13**	<0.0017	**0.025 J**	<0.018	<0.018	<0.0017	<0.018
Phenol	950	45	1400	130	NA	<0.0013	<0.014	<0.0013	NM	<0.0013	<0.064	<1.3	<0.066	<1.3	<0.065	<0.063	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.013	<0.0013	<0.013	<0.0013	<0.013	<0.014	<0.013	<0.0013	<0.013
Pyrene	1700	8400	19000	25000	NA	<0.00070	**0.17**	**0.0013 J**	NM	**0.00081 J**	<0.035	<0.73	<0.036	<0.72	<0.036	<0.035	**0.0016 J**	<0.00071	**0.0074**	<0.00070	**0.0011 J**	**0.0083 J**	<0.00071	**0.17**	<0.00069	**0.037 J**	<0.0074	<0.0072	**0.0013 J**	**0.018 J**
Total Petroleum Hydrocarbon																														
nC6 to nC12	---	---	---	---	NA	<6.7	<9.7	<7.5	NM	<6.6	<6.9	<7.2	<7.0	<7.6	<7.1	<7.1	<7.1	<7.1	<6.1	<6.6	<7.1	<7.7	<6.8	<8.7	<6.9	<8.9	<7.2	<9.6	<6.5	<8.6
>nC12 to nC28	---	---	---	---	NA	<8.8	**14 J**	<9.8	NM	<8.7	<9.0	<9.5	<9.2	**900**	**14 J**	<9.4	<9.4	<9.3	<8.1	<8.7	<9.3	<10	<8.9	**370**	<9.1	<12	<9.5	<13	<8.5	<11
>nC28 to nC35	---	---	---	---	NA	<8.8	**61 J**	<9.8	NM	<8.7	<9.0	<9.5	<9.2	**910**	**120**	<9.4	<9.4	<9.3	<8.1	<8.7	<9.3	<10	<8.9	**500**	**51**	<12	<9.5	<13	<8.5	<11
Total Petroleum Hydrocarbon	5,797	NC	58000	NC	NA	<6.7	**75**	<7.5	NM	<6.6	<6.9	<7.2	<7.0	**1810**	**134**	<7.1	<7.1	<7.1	<6.1	<6.6	<7.1	<7.7	<6.8	**870**	**51**	<8.9	<7.2	<9.6	<6.5	<8.6

Notes:

(1) Concentrations were compared to the lower of the TotSoilcomb and GWSoilIng TCEQ TRRP Tier 1 or Tier 2 Residential Soil PCLs (30 acre source area) (March 2022). Tier 2 calculations were presented in the Affected Property Assessment Report (APAR) dated October 15, 2010 (PBW, 2010).

(2) Metal concentrations were compared to the higher of the TRRP Tier 1 PCL and the Texas-Specific Background Concentrations (TSBC).

(3) Lead concentrations were compared to TRRP Tier 2 PCLs based on the formula and default values presented in TCEQ Guidance Document Establishing Critical Protective Concentration Levels (PCLs) for Lead-Affected Soils (TCEQ, August 2001).

(4) Constituent detections above the sample detection limit (SDL) have been bolded.

(5) Concentrations exceeding the RAL are highlighted yellow. The applicable action level is highlighted gray.

(6) J = Analyte detected below the quantitation limit.

(7) TPH PCL based on TPH mixture PCL for an unresolved complex mixture (UCM) as detailed in the Interim NAPL and TPH-NAPL Assessment Report (Golder, 2020).

(8) Arsenic SPLP results compared to TRRP Tier 1 $^{GW}GW_{ING}$ PCL (0.01 mg/L)

NC- Not Calculated - According to the TCEQ TRRP Tier 1 TPH PCL Calculator for TCEQ Method 1006 Data, the GW-Soil-Ing PCL not needed based on the Hazard Index (Golder, 2020).

NM- Not Measured

Table 1
Baseline Soil Assessment
Union Pacific Railroad - Englewood Intermodal Yard; Schneider Lease Property
Houston, TX

Location ID	TRRP Tier 1 or 2 Residential PCLs*		TRRP Tier 1 or 2 Commercial/Industrial PCLs		Texas Specific Background Concentration	BLS-23	BLS-24	BLS-24	BLS-25	BLS-25	BLS-26	BLS-26	BLS-27	BLS-27	BLS-28	BLS-28	BLS-29	BLS-29	BLS-30	BLS-30	BLS-30	BLS-31	BLS-31	BLS-31
Sample Interval						7.5-10	0-2.5	7.5-10	0-2.5	7.5-10	0-2.5	7.5-10	0-2.5	7.5-10	0-2.5	7.5-10	0-2.5	7.5-10	0-2.5	7.5-10	12.5-15	0-2.5	7.5-10	12.5-15
Sample Date	$^{Tot}Soil_{Comb}$	$^{GW}Soil_{Ing}$	$^{Tot}Soil_{Comb}$	$^{GW}Soil_{Ing}$		8/24/2022	10/11/2022	10/11/2022	10/11/2022	10/11/2022	10/11/2022	10/11/2022	10/11/2022	10/11/2022	10/11/2022	10/11/2022	10/11/2022	10/11/2022	12/15/2022	12/15/2022	12/15/2022	12/15/2022	12/15/2022	12/15/2022
Constituent	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Metals																								
Arsenic	24	2.5	200	2.5	5.9	**1.82**	**2.65**	**2.42**	**3.13**	**2.43**	**1.92**	**8.15**	**4.57**	**1.38**	NM	NM	NM	NM	0.647	1.01	**7.38**	1.94	5.82	3.45
*Arsenic SPLP (mg/L)**	NA	NA	NA	NA	NA	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	**0.00415 J**	NM	NM	NM
Lead	500	275	1600	275	15	**7.58**	NM	NM	NM	NM	NM	NM	NM	NM	**170**	**6.09**	**270**	**7.31**	NM	NM	NM	NM	NM	NM
Volatile Organic Compounds																								
1,2 Dichloroethane	30	0.031	71	0.031	NA	< 0.00059	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Benzene	69	0.1	130	0.1	NA	< 0.00049	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Chlorobenzene	320	6.5	540	6.5	NA	< 0.00059	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Ethylbenzene	5300	44	17000	44	NA	< 0.00069	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Methylene chloride	1500	0.022	8600	0.021	NA	< 0.00098	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Toluene	5400	43	29000	43	NA	< 0.00059	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Xylenes, Total	3700	730	6500	730	NA	< 0.00098	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Semi-Volatile Organic Compounds																								
1,2-Diphenylhydrazine	5.4	0.23	20	0.51	NA	<0.0013	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
2,4-Dimethylphenol	1300	18	14000	53	NA	<0.0039	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
2,4-Dinitrotoluene	6.9	0.022	28	0.049	NA	<0.0011	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
2,6-Dinitrotoluene	6.9	0.018	28	0.04	NA	<0.0039	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
2-Chloronaphthalene	5000	5000	50000	15000	NA	<0.0015	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
2-Methylnaphthalene	250	130	2500	380	NA	<0.00059	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
4,6-Dinitro-2-methylphenol	6.7	0.0021	68	0.54	NA	<0.0025	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
4-Nitrophenol	130	0.089	1400	0.27	NA	<0.0023	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Acenaphthene	3000	1800	37000	5200	NA	<0.00059	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Acenaphthylene	3800	3000	37000	9100	NA	<0.0012	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Anthracene	18000	3400	190000	10000	NA	<0.00059	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Benz(a)anthracene	41	130	170	300	NA	<0.0019	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Benzo(a)pyrene	4.1	57	17	57	NA	<0.0012	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Bis(2-chloroethoxy)methane	2.5	0.077	6.2	0.17	NA	<0.0011	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Bis(2-ethylhexyl)phthalate	43	1200	560	1200	NA	**0.0032 J**	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Chrysene	4100	12000	17000	26000	NA	<0.00095	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Dibenzofuran	270	250	2700	740	NA	<0.00083	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Di-n-butyl phthalate	6200	25000	68000	74000	NA	**0.0028 J**	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Fluoranthene	2300	14000	25000	43000	NA	<0.0013	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Fluorene	2300	2200	25000	6600	NA	<0.0013	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Naphthalene	120	230	190	680	NA	<0.00071	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Nitrobenzene	34	0.49	57	1.5	NA	<0.0011	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
N-Nitrosodiphenylamine	570	19	1900	42	NA	<0.00083	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Pentachlorophenol	0.73	0.12	32	0.12	NA	<0.0039	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Phenanthrene	1700	3100	19000	9300	NA	<0.0018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Phenol	950	45	1400	130	NA	<0.0013	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Pyrene	1700	8400	19000	25000	NA	<0.00071	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Total Petroleum Hydrocarbon																								
nC6 to nC12	---	---	---	---	NA	<7.0	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
>nC12 to nC28	---	---	---	---	NA	<9.2	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
>nC28 to nC35	---	---	---	---	NA	<9.2	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Total Petroleum Hydrocarbon	5,797	NC	58000	NC	NA	<7.0	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM

Notes:

(1) Concentrations were compared to the lower of the TotSoilcomb and GWSoilIng TCEQ TRRP Tier 1 or Tier 2 Residential Soil PCLs (30 acre source area) (March 2022). Tier 2 calculations were presented in the Affected Property Assessment Report (APAR) dated October 15, 2010 (PBW, 2010).

(2) Metal concentrations were compared to the higher of the TRRP Tier 1 PCL and the Texas-Specific Background Concentrations (TSBC).

(3) Lead concentrations were compared to TRRP Tier 2 PCLs based on the formula and default values presented in TCEQ Guidance Document Establishing Critical Protective Concentration Levels (PCLs) for Lead-Affected Soils (TCEQ, August 2001).

(4) Constituent detections above the sample detection limit (SDL) have been bolded.

(5) Concentrations exceeding the RAL are highlighted yellow. The applicable action level is highlighted gray.

(6) J = Analyte detected below the quantitation limit.

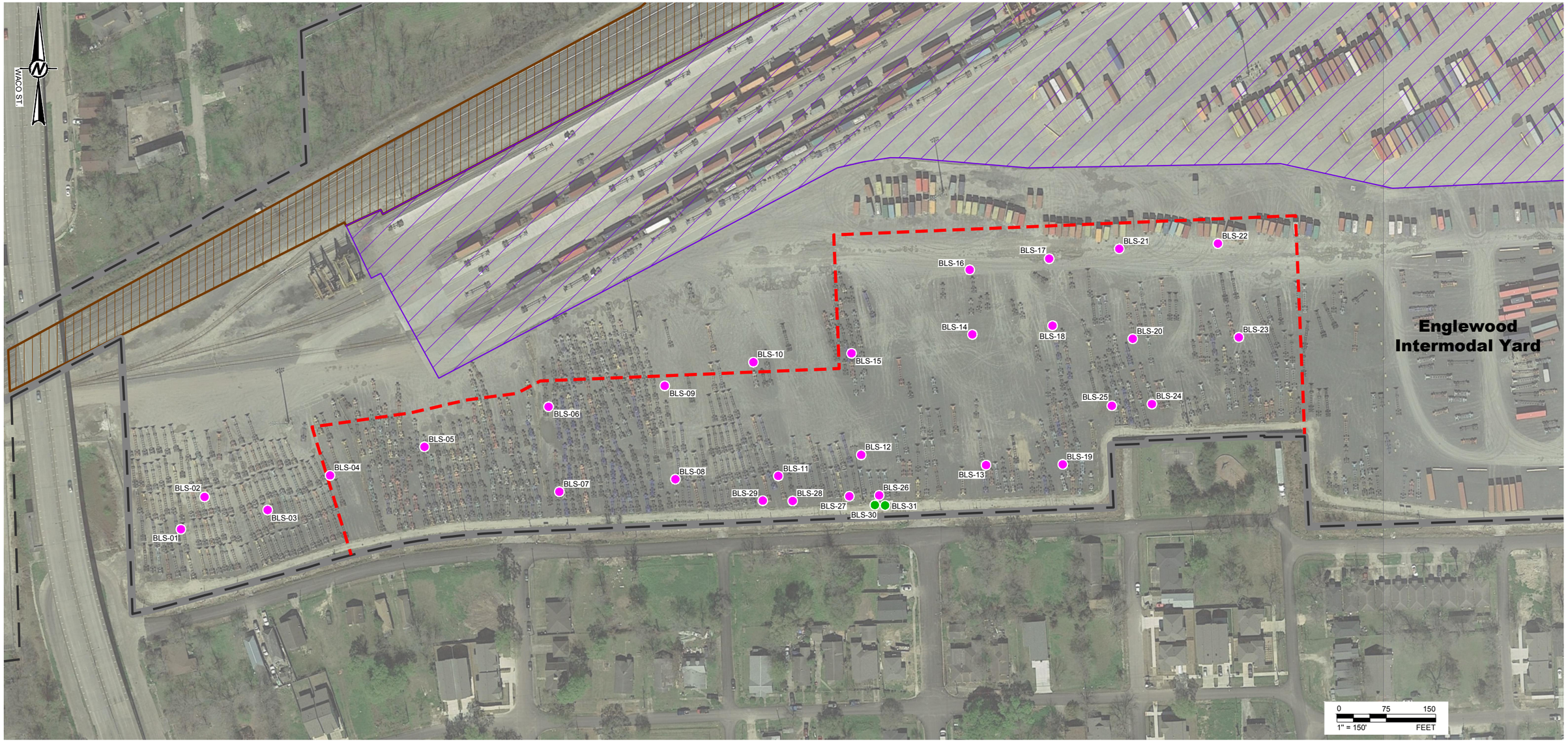
(7) TPH PCL based on TPH mixture PCL for an unresolved complex mixture (UCM) as detailed in the Interim NAPL and TPH-NAPL Assessment Report (Golder, 2020).

(8) Arsenic SPLP results compared to TRRP Tier 1 $^{GW}GW_{ING}$ PCL (0.01 mg/L)

NC- Not Calculated - According to the TCEQ TRRP Tier 1 TPH PCL Calculator for TCEQ Method 1006 Data, the GW-Soil-Ing PCL not needed based on the Hazard Index (Golder, 2020).

NM- Not Measured

FIGURES



LEGEND

- UPRR PROPERTY BOUNDARY
- RAILROAD BALLAST CAP AREA
- ASPHALT CAP AREA
- SOIL CAP
- CONCRETE CAP AREA
- APPROXIMATE PROPOSED FENCE BOUNDARY
- BASELINE SOIL SAMPLING LOCATION (AUGUST AND OCTOBER 2022)
- BASELINE SOIL SAMPLING LOCATION (DECEMBER 2022)

NOTE(S)

1. PROPOSED FENCE TO BE TIED INTO EXISTING PERIMETER FENCE.

REFERENCE(S)

AERIAL: GOOGLE EARTH, IMAGERY DATED 2/23/19.

CLIENT
UNION PACIFIC RAILROAD CO.

PROJECT
HOUSTON WOOD PRESERVING WORKS

TITLE
SOIL BORING LOCATION MAP

CONSULTANT
wsp

YYYY-MM-DD	2023-01-06
DESIGNED	AJD
PREPARED	AJD
REVIEWED	MH
APPROVED	ECM

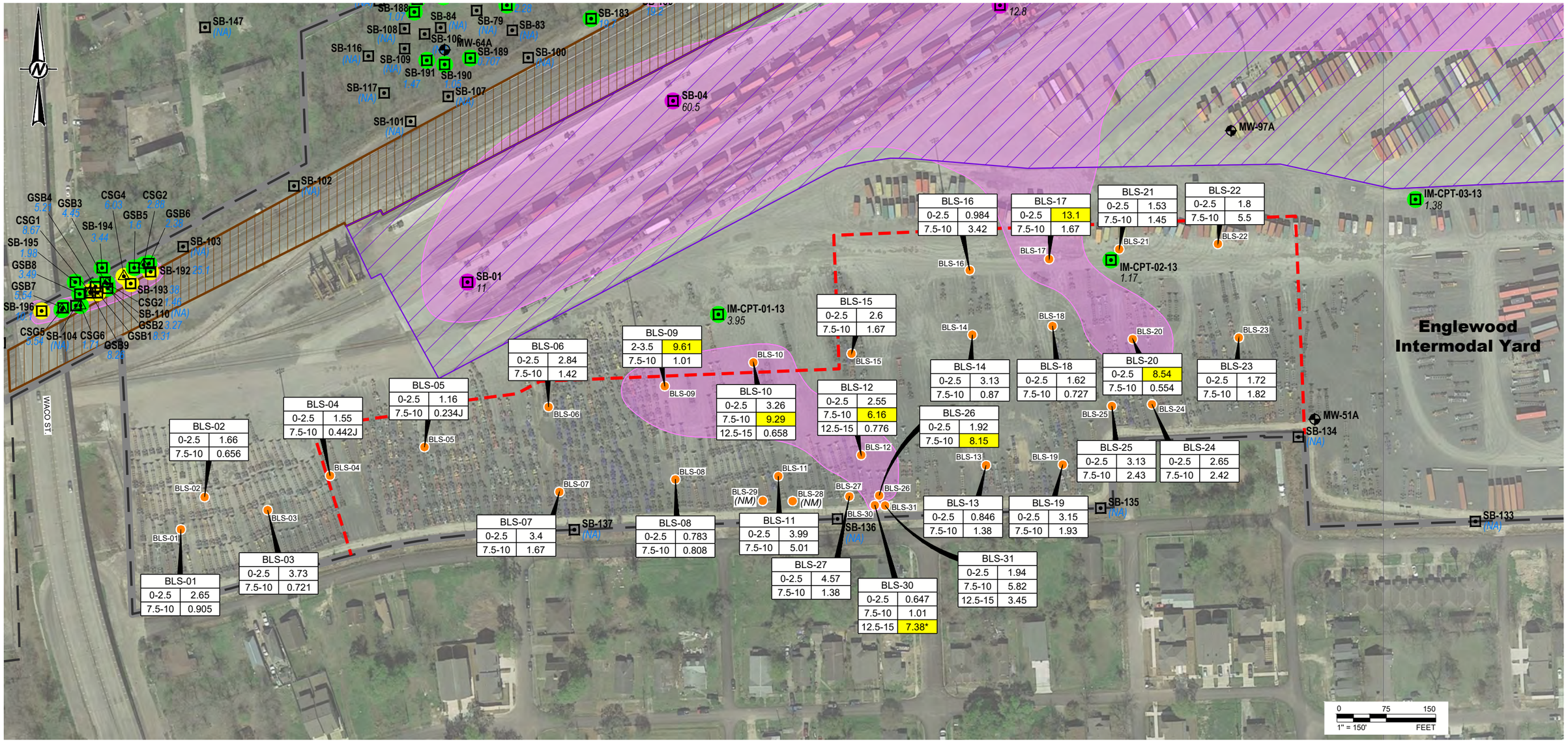
PROJECT NO. 31404514.014 | REV. 0 | FIGURE 1

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

1 in

0

Path: \\golder.gds\complexdata\office\Texarkana\Projects - Round Rock_20223\1404514 - UPRR HWP\WPRODUCTION\2022-10\ | File Name: 1 - Soil Boring Location Map.dwg | Last Edited By: tbookout Date: 2022-10-28 Time:4:40:42 PM | Printed By: TBookout Date: 2023-01-06 Time:12:54:20 PM



LEGEND

- UPRR PROPERTY BOUNDARY
- RAILROAD BALLAST CAP AREA
- CONCRETE CAP AREA
- APPROXIMATE PROPOSED FENCE BOUNDARY
- BASELINE SOIL SAMPLING LOCATION
- AFFECTED PROPERTY/PCLE ZONE
- SOIL BORING LOCATION (PRESENTED IN 2017 RACR)
- CONFIRMATION SAMPLE LOCATION (PRESENTED IN 2017 RACR)
- DETECTED SURFACE SOIL CONCENTRATION <RAL (PRESENTED IN 2017 RACR)
- DETECTED SURFACE SOIL CONCENTRATION >RAL (PRESENTED IN 2017 RACR)
- DETECTED SURFACE SOIL CONCENTRATION >cPCL (PRESENTED IN 2017 RACR)
- A-TZ MONITORING WELL LOCATION

NOTE(S)

1. PROPOSED FENCE TO BE TIED INTO EXISTING PERIMETER FENCE.

Sample ID	
Sample Interval (FT BGS)	Arsenic Concentration (mg/Kg)

NOTE(S)

1. RESIDENTIAL ASSESSMENT LEVEL (RAL) = 5.9 mg/Kg.
2. CRITICAL PCL (cPCL) = 5.9 mg/Kg (ON-SITE), 5.9 mg/Kg (OFF-SITE).
3. RAL AND cPCL BASED ON TIER 1 AND 2 RES/CI PCLs, 30 ACRE SOURCE AREA.
4. * - ARSENIC SPLP RESULT AT BLS-30 (12.5-15) WAS 0.00418J mg/L (BELOW $^{GW}GW_{Ing}$ PCL (0.01 mg/L); THEREFORE, THE ARSENIC CONCENTRATION IS PROTECTIVE OF THE SHALLOW GROUNDWATER AND SATISFIES THE DELINEATION REQUIREMENT TO THE APPROPRIATE ASSESSMENT LEVEL.

REFERENCE(S)

1. AERIAL: GOOGLE EARTH, IMAGERY DATED 2/23/19.
2. 2017 RESPONSE ACTION COMPLETION REPORT (RACR), UNION PACIFIC RAILROAD, HOUSTON, TEXAS WOOD PRESERVING WORKS.

STATE OF TEXAS
ERIC C. MATZNER
GEOLOGY
LIC. # 795
LICENSED
PROFESSIONAL GEOSCIENTIST
02/14/2023

CLIENT
UNION PACIFIC RAILROAD CO.

PROJECT
HOUSTON WOOD PRESERVING WORKS

TITLE
SURFACE SOIL ARSENIC CONCENTRATION MAP

CONSULTANT
wsp

YYYY-MM-DD	2022-01-09
DESIGNED	AJD
PREPARED	AJD
REVIEWED	MH
APPROVED	ECM

PROJECT NO. 31404514.014 | REV. 0 | FIGURE 2

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

Path: \\pdxfiler.gds\comp\exdata\office\Texarkana\Projects - Round Rock_2022\31404514 - UPRR HWPW\PRODUCTION\2022-10\ | File Name: 2 - Surface Soil Arsenic Conc Map.dwg | Last Edited By: tbookout Date: 2022-01-31 Time:9:53:49 AM | Plot Date: 2023-01-09 Time:1:39:19 PM | Printed By: USADT01305 Date: 2023-01-31 Time:9:53:49 AM

ATTACHMENT A

Data Usability Summary and Laboratory Report

27 January 2023

To	Eric Matzner		
Copy to	Jesse Orth, Julie Lidstone		
From	Chris G. Knight/eew/1460	**Tel**	512-506-8803
Subject	Data Usability Summary Baseline Soil Assessment Union Pacific Railroad (UPRR)/Houston TX Wood Preserving Works Houston, Texas December 2022	**Project no.**	11183954-1620

1. Scope of Data Usability Study

This document details a Data Usability Summary (DUS) of analytical results for samples collected in support of the Baseline Soil Assessment at the UPRR/Houston TX-Wood Preserving Works site during December 2022. Samples were submitted to ALS Global, located in Houston, Texas and are reported in data package HS22120899. The intended use of the data is to support the Baseline Soil Assessment at the site by providing current concentration of chemicals of concern.

Data were reviewed and validated by Chris G. Knight of GHD Services Inc. (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 analyses, the laboratory review checklists (LRC), and the laboratory exceptions (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 2A. While a synthetic precipitation leaching procedure (SPLP) result is presented in Table 2B, it is included only for informational purposes. No data review or verification was performed on the SPLP analysis. 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 #T104704231 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 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 Hold Time and Preservation

Samples were shipped with chains of custody and the paperwork was filled out properly. All samples were delivered on ice and stored by the laboratory at the required temperature (0-6°C).

Sample chain of custody documents 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 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 package.

For this study, laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch and results are reported in the laboratory data package.

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

4.5 Laboratory Control Sample Analyses

LCS are prepared and analyzed as samples to assess the analytical efficiencies of the method 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, LCS were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

The LCS contained all analytes of concern. All LCS recoveries were within the laboratory control limits, demonstrating acceptable analytical accuracy.

4.6 Matrix Spike Analyses

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

The laboratory performed MS/MSD analyses on non-site samples. These cannot be used to assess accuracy and precision for the site samples.

4.7 Duplicate Sample Analyses

Analytical precision is evaluated based on the analysis of laboratory duplicate samples. For this study, duplicate samples were prepared and analyzed by the laboratory for metals analysis. The relative percent differences (RPD) established by the laboratory are adopted as the acceptance criteria for the project.

The laboratory performed duplicate analyses on non-site samples. These cannot be used to assess precision for the site samples.

4.8 Field Procedures

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

5. Analyte Reporting

The laboratory reported detected results for each analyte down to the sample detection limit (SDL), which is defined as the MDL with sample-specific adjustments for dilutions, aliquot size, volumes, etc.

All detectability check standard (DCS) results supported the laboratory method detection limits (MDL).

All soil results were reported on a dry weight basis.

6. Conclusion

Based on the assessment detailed in the foregoing, the analytical data summarized in Table 2A are usable for the purpose of supporting the Baseline Soil Assessment by providing current concentrations of the chemicals of concern in samples at the site without qualification.

Regards

Chris G. Knight
Data Management Team – Data Validator

Table 1

Sample Collection and Analysis Summary
Baseline Soil Sampling
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
December 2022

Sample Identification	Location	Matrix	Initial Sample Depth (ft bgs)	Final Sample Depth (ft bgs)	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameters	
							Arsenic	SPLP Arsenic
SO-1620-BLS-30(0-2.5)-20221215	BLS-30	Soil	0	2.5	12/15/2022	09:50	X	
SO-1620-BLS-30(12.5-15)-20221	BLS-30	Soil	12.5	15	12/15/2022	10:02	X	X
SO-1620-BLS-31(0-2.5)-20221215	BLS-31	Soil	0	2.5	12/15/2022	10:15	X	
SO-1620-BLS-31(7.5-10)-202212	BLS-31	Soil	7.5	10	12/15/2022	10:21	X	
SO-1620-BLS-31(12.5-15)-20221	BLS-31	Soil	12.5	15	12/15/2022	10:27	X	
SO-1620-BLS-30(7.5-10)-202212	BLS-30	Soil	7.5	10	12/15/2022	10:31	X	

Notes:

ft bgs - Feet Below Ground Surface
SPLP - Synthetic Precipitation Leaching Procedure

Table 2A

Analytical Results Summary
Baseline Soil Assessment
Union Pacific Railroad (UPRR)/Houston TX-Wood Preserving Works
Houston, Texas
December 2022

Sample Name:		**SO-1620-BLS-30(7.5-10)-202212**	**SO-1620-BLS-30(12.5-15)-20221**	**SO-1620-BLS-30(0-2.5)-20221215**
Sample Date:		**12/15/2022**	**12/15/2022**	**12/15/2022**
Depth:		**7.5-10 ft bgs**	**12.5-15 ft bgs**	**0-2.5 ft bgs**
Parameters	**Unit**			
Metals				
Arsenic	mg/kg	1.01	7.38	0.647

Table 2A

Analytical Results Summary
Baseline Soil Assessment
Union Pacific Railroad (UPRR)/Houston TX-Wood Preserving Works
Houston, Texas
December 2022

Sample Name:		**SO-1620-BLS-31(7.5-10)-202212**	**SO-1620-BLS-31(12.5-15)-20221**	**SO-1620-BLS-31(0-2.5)-20221215**
Sample Date:		**12/15/2022**	**12/15/2022**	**12/15/2022**
Depth:		**7.5-10 ft bgs**	**12.5-15 ft bgs**	**0-2.5 ft bgs**
Parameters	**Unit**			
Metals				
Arsenic	mg/kg	5.82	3.45	1.94

Notes:

ft bgs - Feet below ground sı

Table 2B

SPLP Analytical Results Summary
Baseline Soil Assessment
Union Pacific Railroad (UPRR)/Houston TX-Wood Preserving Works
Houston, Texas
December 2022

Location ID:	**BLS-30**
Sample Name:	**SO-1620-BLS-30(12.5-15)-20221**
Sample Date:	**12/15/2022**
Depth:	**12.5-15 ft bgs**

Parameters	**Unit**	
Metals, SPLP		
Arsenic	mg/L	0.00415 J

Notes:

ft bgs - Feet below ground surface
SPLP - Synthetic Precipitation Leaching Procedure
J - Estimated concentration

Table 3

Analytical Methods
Baseline Soil Sampling
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
December 2022

Parameter	Method	Matrix	Holding Time	
			Collection to Extraction (Days)	Collection or Extraction to Analysis (Days)
Arsenic	SW-846 6020A	Soil	-	180
SPLP Arsenic	SW-846 13126020A	Soil	180	180

Notes:

SPLP - Synthetic Precipitation Leaching Procedure
"-" - Not Applicable

Method References:

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

Attachment A

Laboratory NELAP Certificate(s)

Texas Commission on Environmental Quality

NELAP-Recognized Laboratory Accreditation is hereby awarded to

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

10450 Stancliff Road, Suite 115
Houston, TX 77099-4338

in accordance with Texas Water Code Chapter 5, Subchapter R, Title 30 Texas Administrative Code Chapter 25, and the National Environmental Laboratory Accreditation Program.

The laboratory's scope of accreditation includes the fields of accreditation that accompany this certificate. Continued accreditation depends upon successful ongoing participation in the program. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current location(s) and accreditation status for particular methods and analyses (www.tceq.texas.gov/goto/lab). Accreditation does not imply that a product, process, system or person is approved by the Texas Commission on Environmental Quality.

Certificate Number: T104704231-22-29
Effective Date: 5/1/2022
Expiration Date: 4/30/2023

Executive Director Texas Commission on Environmental Quality

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

December 30, 2022

Eric Matzner
WSP Golder
1601 S. MoPac Expressway
Suite 325D
Austin, TX 78746

Work Order: **HS22120899**

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

Dear Eric Matzner,

ALS Environmental received 6 sample(s) on Dec 15, 2022 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:	WSP Golder	**TRRP Laboratory Data Package Cover Page**
Project:	Houston TX-Wood Preserving Works	
WorkOrder:	**HS22120899**	

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.

ALS Houston, US Date: 30-Dec-22

Client:	WSP Golder	**TRRP Laboratory Data Package Cover Page**
Project:	Houston TX-Wood Preserving Works	
WorkOrder:	**HS22120899**	

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: 12/20/2022				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS22120899				
Reviewer Dane Wacasey			Prep Batch Number(s): 187463,R424271				
#[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				
		Were MS/MSD RPDs within laboratory QC limits?	X				
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 effects on the sample results?	X				
		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: 12/20/2022				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS22120899				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 187463,R424271				
#[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: 12/20/2022
Project Name: Houston TX-Wood Preserving Works	Laboratory Job Number: HS22120899
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 187463,R424271

ER#[5]	Description
	No Exceptions

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: WSP Golder
Project: Houston TX-Wood Preserving Works
Work Order: HS22120899

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS22120899-01	SO-1620-BLS-30(0-2.5)-20221215	Soil		15-Dec-2022 09:50	15-Dec-2022 14:15	☐
HS22120899-02	SO-1620-BLS-30(12.5-15)-20221215	Soil		15-Dec-2022 10:02	15-Dec-2022 14:15	☐
HS22120899-03	SO-1620-BLS-31(0-2.5)-20221215	Soil		15-Dec-2022 10:15	15-Dec-2022 14:15	☐
HS22120899-04	SO-1620-BLS-31(7.5-10)-20221215	Soil		15-Dec-2022 10:21	15-Dec-2022 14:15	☐
HS22120899-05	SO-1620-BLS-31(12.5-15)-20221215	Soil		15-Dec-2022 10:27	15-Dec-2022 14:15	☐
HS22120899-06	SO-1620-BLS-30(7.5-10)-20221215	Soil		15-Dec-2022 10:31	15-Dec-2022 14:15	☐

ALS Houston, US Date: 30-Dec-22

Client: WSP Golder

ANALYTICAL REPORT

Project: Houston TX-Wood Preserving Works

WorkOrder:HS22120899

Sample ID: SO-1620-BLS-30(0-2.5)-20221215

Lab ID:HS22120899-01

Collection Date: 15-Dec-2022 09:50

Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A	**Method:SW6020A**				Prep:SW3050B / 19-Dec-2022		Analyst: JHD
Arsenic	**0.647**		**0.0817**	**0.583**	**mg/Kg-dry**	1	19-Dec-2022 20:00
MOISTURE - ASTM D2216	**Method:ASTM D2216**						Analyst: FO
Percent Moisture	**17.1**		**0.0100**	**0.0100**	**wt%**	1	16-Dec-2022 11:37

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

Client: WSP Golder

ANALYTICAL REPORT

Project: Houston TX-Wood Preserving Works

WorkOrder:HS22120899

Sample ID: SO-1620-BLS-30(12.5-15)-20221215

Lab ID:HS22120899-02

Collection Date: 15-Dec-2022 10:02

Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
SPLP METALS BY SW6020A		**Method:SW6020A**	Leache:SW1312 / 23-Dec-2022	Prep:SW3010A / 29-Dec-2022			Analyst: JHD
Arsenic	**0.00415**	J	**0.000400**	**0.00500**	**mg/L**	1	29-Dec-2022 18:23
METALS BY SW6020A		**Method:SW6020A**		Prep:SW3050B / 19-Dec-2022			Analyst: JHD
Arsenic	**7.38**		**0.0785**	**0.561**	**mg/Kg-dry**	1	19-Dec-2022 20:02
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: FO
Percent Moisture	**15.4**		**0.0100**	**0.0100**	**wt%**	1	16-Dec-2022 11:37

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

Client: WSP Golder

ANALYTICAL REPORT

Project: Houston TX-Wood Preserving Works

WorkOrder:HS22120899

Sample ID: SO-1620-BLS-31(0-2.5)-20221215

Lab ID:HS22120899-03

Collection Date: 15-Dec-2022 10:15

Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A	**Method:SW6020A**				Prep:SW3050B / 19-Dec-2022		Analyst: JHD
Arsenic	**1.94**		**0.0780**	**0.557**	**mg/Kg-dry**	1	19-Dec-2022 20:04
MOISTURE - ASTM D2216	**Method:ASTM D2216**						Analyst: FO
Percent Moisture	**15.4**		**0.0100**	**0.0100**	**wt%**	1	16-Dec-2022 11:37

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

Client: WSP Golder
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-BLS-31(7.5-10)-20221215
Collection Date: 15-Dec-2022 10:21

ANALYTICAL REPORT
WorkOrder:HS22120899
Lab ID:HS22120899-04
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A	**Method:SW6020A**				Prep:SW3050B / 19-Dec-2022		Analyst: JHD
Arsenic	**5.82**		**0.0767**	**0.548**	**mg/Kg-dry**	1	19-Dec-2022 20:06
MOISTURE - ASTM D2216	**Method:ASTM D2216**						Analyst: FO
Percent Moisture	**14.5**		**0.0100**	**0.0100**	**wt%**	1	16-Dec-2022 11:37

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

Client: WSP Golder

ANALYTICAL REPORT

Project: Houston TX-Wood Preserving Works

WorkOrder:HS22120899

Sample ID: SO-1620-BLS-31(12.5-15)-20221215

Lab ID:HS22120899-05

Collection Date: 15-Dec-2022 10:27

Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A	**Method:SW6020A**				Prep:SW3050B / 19-Dec-2022		Analyst: JHD
Arsenic	**3.45**		**0.0799**	**0.571**	**mg/Kg-dry**	1	19-Dec-2022 20:08
MOISTURE - ASTM D2216	**Method:ASTM D2216**						Analyst: FO
Percent Moisture	**16.7**		**0.0100**	**0.0100**	**wt%**	1	16-Dec-2022 11:37

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

Client: WSP Golder

ANALYTICAL REPORT

Project: Houston TX-Wood Preserving Works

WorkOrder:HS22120899

Sample ID: SO-1620-BLS-30(7.5-10)-20221215

Lab ID:HS22120899-06

Collection Date: 15-Dec-2022 10:31

Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A	**Method:SW6020A**				Prep:SW3050B / 19-Dec-2022		Analyst: JHD
Arsenic	**1.01**		**0.0773**	**0.552**	**mg/Kg-dry**	1	19-Dec-2022 20:10
MOISTURE - ASTM D2216	**Method:ASTM D2216**						Analyst: FO
Percent Moisture	**16.1**		**0.0100**	**0.0100**	**wt%**	1	16-Dec-2022 11:37

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

Weight / Prep Log

Client: WSP Golder
Project: Houston TX-Wood Preserving Works
WorkOrder: HS22120899

Batch ID: 187463 **Start Date:** 19 Dec 2022 08:30 **End Date:** 19 Dec 2022 14:30
Method: METALS PREP - SOLIDS - SW3050B **Prep Code:** 3050_I_LOW

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS22120899-01		0.5169 (g)	50 (mL)	96.73	4-oz glass, Neat
HS22120899-02		0.5271 (g)	50 (mL)	94.86	4-oz glass, Neat
HS22120899-03		0.5306 (g)	50 (mL)	94.23	4-oz glass, Neat
HS22120899-04		0.534 (g)	50 (mL)	93.63	4-oz glass, Neat
HS22120899-05		0.5257 (g)	50 (mL)	95.11	4-oz glass, Neat
HS22120899-06		0.5398 (g)	50 (mL)	92.63	4-oz glass, Neat

Batch ID: 187749 **Start Date:** 22 Dec 2022 15:00 **End Date:** 23 Dec 2022 08:00
Method: SPLP METALS EXTRACTION BY SW1312 **Prep Code:** 1312LM

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS22120899-02		25 (g)	500 (mL)	20	4-oz glass, Neat

Batch ID: 187944 **Start Date:** 29 Dec 2022 08:00 **End Date:** 29 Dec 2022 20:00
Method: SPLP LEACHATE DIGESTION BY SW3010A **Prep Code:** 3010A_SPLP

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS22120899-02		10 (mL)	10 (mL)	1	4-oz glass, Neat

Client: WSP Golder
Project: Houston TX-Wood Preserving Works
WorkOrder: HS22120899

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 187463 (0)	**Test Name :** METALS BY SW6020A				**Matrix:** Soil	
HS22120899-01	SO-1620-BLS-30(0-2.5)-20221215	15 Dec 2022 09:50		19 Dec 2022 08:30	19 Dec 2022 20:00	1
HS22120899-02	SO-1620-BLS-30(12.5-15)-20221215	15 Dec 2022 10:02		19 Dec 2022 08:30	19 Dec 2022 20:02	1
HS22120899-03	SO-1620-BLS-31(0-2.5)-20221215	15 Dec 2022 10:15		19 Dec 2022 08:30	19 Dec 2022 20:04	1
HS22120899-04	SO-1620-BLS-31(7.5-10)-20221215	15 Dec 2022 10:21		19 Dec 2022 08:30	19 Dec 2022 20:06	1
HS22120899-05	SO-1620-BLS-31(12.5-15)-20221215	15 Dec 2022 10:27		19 Dec 2022 08:30	19 Dec 2022 20:08	1
HS22120899-06	SO-1620-BLS-30(7.5-10)-20221215	15 Dec 2022 10:31		19 Dec 2022 08:30	19 Dec 2022 20:10	1
Batch ID: 187944 (0)	**Test Name :** SPLP METALS BY SW6020A				**Matrix:** Soil	
HS22120899-02	SO-1620-BLS-30(12.5-15)-20221215	15 Dec 2022 10:02	23 Dec 2022 08:00	29 Dec 2022 08:00	29 Dec 2022 18:23	1
Batch ID: R424271 (0)	**Test Name :** MOISTURE - ASTM D2216				**Matrix:** Soil	
HS22120899-01	SO-1620-BLS-30(0-2.5)-20221215	15 Dec 2022 09:50			16 Dec 2022 11:37	1
HS22120899-02	SO-1620-BLS-30(12.5-15)-20221215	15 Dec 2022 10:02			16 Dec 2022 11:37	1
HS22120899-03	SO-1620-BLS-31(0-2.5)-20221215	15 Dec 2022 10:15			16 Dec 2022 11:37	1
HS22120899-04	SO-1620-BLS-31(7.5-10)-20221215	15 Dec 2022 10:21			16 Dec 2022 11:37	1
HS22120899-05	SO-1620-BLS-31(12.5-15)-20221215	15 Dec 2022 10:27			16 Dec 2022 11:37	1
HS22120899-06	SO-1620-BLS-30(7.5-10)-20221215	15 Dec 2022 10:31			16 Dec 2022 11:37	1

WorkOrder: HS22120899
InstrumentID: ICPMS07
Test Code: 1312_METALS_HS
Test Number: SW6020A
Test Name: SPLP Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Leachate **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Arsenic	7440-38-2	0.00125	0.00119	0.000400	0.00500

ALS Houston, US Date: 30-Dec-22

WorkOrder: HS22120899
InstrumentID: ICPMS07
Test Code: ICP_S_Low
Test Number: SW6020A
Test Name: Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

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

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Arsenic	7440-38-2	0.100	0.105	0.0700	0.500

WorkOrder: HS22120899
InstrumentID: Balance1
Test Code: MOIST_ASTM
Test Number: ASTM D2216
Test Name: Moisture - ASTM D2216

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** wt%

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Percent Moisture	MOIST	0	0	0.0100	0.0100

Client: WSP Golder
Project: Houston TX-Wood Preserving Works
WorkOrder: HS22120899

QC BATCH REPORT

Batch ID: 187463 (0) **Instrument: ICPMS07** **Method: METALS BY SW6020A**

MBLK Sample ID: **MBLK-187463** Units: **mg/Kg** Analysis Date: **19-Dec-2022 19:14**
Client ID: Run ID: **ICPMS07_424300** SeqNo: **7040139** PrepDate: **19-Dec-2022** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	< 0.0697	0.498								

LCS Sample ID: **LCS-187463** Units: **mg/Kg** Analysis Date: **19-Dec-2022 19:16**
Client ID: Run ID: **ICPMS07_424300** SeqNo: **7040140** PrepDate: **19-Dec-2022** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	9.728	0.498	9.968	0	97.6	80 - 120				

MS Sample ID: **HS22120651-01MS** Units: **mg/Kg** Analysis Date: **19-Dec-2022 19:22**
Client ID: Run ID: **ICPMS07_424300** SeqNo: **7040143** PrepDate: **19-Dec-2022** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	23.87	0.473	9.463	14.36	100	75 - 125				

MSD Sample ID: **HS22120651-01MSD** Units: **mg/Kg** Analysis Date: **19-Dec-2022 19:24**
Client ID: Run ID: **ICPMS07_424300** SeqNo: **7040144** PrepDate: **19-Dec-2022** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	23.12	0.480	9.602	14.36	91.2	75 - 125	23.87	3.21	20	

PDS Sample ID: **HS22120651-01PDS** Units: **mg/Kg** Analysis Date: **19-Dec-2022 19:26**
Client ID: Run ID: **ICPMS07_424300** SeqNo: **7040145** PrepDate: **19-Dec-2022** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	23.28	0.465	9.308	14.36	95.8	75 - 125				

SD Sample ID: **HS22120651-01SD** Units: **mg/Kg** Analysis Date: **19-Dec-2022 19:20**
Client ID: Run ID: **ICPMS07_424300** SeqNo: **7040142** PrepDate: **19-Dec-2022** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	14.96	2.33					14.36	4.15	10	

The following samples were analyzed in this batch: HS22120899-01 HS22120899-02 HS22120899-03 HS22120899-04 HS22120899-05 HS22120899-06

Client: WSP Golder
Project: Houston TX-Wood Preserving Works
WorkOrder: HS22120899

QC BATCH REPORT

Batch ID: 187944 (0) **Instrument: ICPMS07** **Method: SPLP METALS BY SW6020A**

MBLK Sample ID: **MBLKP2-187944** Units: **mg/L** Analysis Date: **29-Dec-2022 18:10**
Client ID: Run ID: **ICPMS07_424997** SeqNo: **7055376** PrepDate: **29-Dec-2022** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	< 0.000400	0.00500								

MBLK Sample ID: **MBLKP3-187944** Units: **mg/L** Analysis Date: **30-Dec-2022 14:12**
Client ID: Run ID: **ICPMS07_425038** SeqNo: **7057069** PrepDate: **29-Dec-2022** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	< 0.000400	0.00500								

MBLK Sample ID: **MBLKP1-187944** Units: **mg/L** Analysis Date: **29-Dec-2022 18:04**
Client ID: Run ID: **ICPMS07_424997** SeqNo: **7055373** PrepDate: **29-Dec-2022** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	< 0.000400	0.00500								

MBLK Sample ID: **MBLK-187944** Units: **mg/L** Analysis Date: **29-Dec-2022 18:02**
Client ID: Run ID: **ICPMS07_424997** SeqNo: **7055372** PrepDate: **29-Dec-2022** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	< 0.000400	0.00500								

LCS Sample ID: **LCS-187944** Units: **mg/L** Analysis Date: **29-Dec-2022 18:12**
Client ID: Run ID: **ICPMS07_424997** SeqNo: **7055377** PrepDate: **29-Dec-2022** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05008	0.00500	0.05	0	100	80 - 120				

MS Sample ID: **HS22120805-19MS** Units: **mg/L** Analysis Date: **29-Dec-2022 18:17**
Client ID: Run ID: **ICPMS07_424997** SeqNo: **7055380** PrepDate: **29-Dec-2022** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05269	0.00500	0.05	0.001121	103	80 - 120				

Client: WSP Golder
Project: Houston TX-Wood Preserving Works
WorkOrder: HS22120899

QC BATCH REPORT

Batch ID: 187944 (0) **Instrument: ICPMS07** **Method: SPLP METALS BY SW6020A**

MSD Sample ID: **HS22120805-19MSD** Units: **mg/L** Analysis Date: **29-Dec-2022 18:19**
Client ID: Run ID: **ICPMS07_424997** SeqNo: **7055381** PrepDate: **29-Dec-2022** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05284	0.00500	0.05	0.001121	103	80 - 120	0.05269	0.284	20	

PDS Sample ID: **HS22120805-19PDS** Units: **mg/L** Analysis Date: **29-Dec-2022 18:21**
Client ID: Run ID: **ICPMS07_424997** SeqNo: **7055382** PrepDate: **29-Dec-2022** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.1073	0.00500	0.1	0.001121	106	75 - 125				

SD Sample ID: **HS22120805-19SD** Units: **mg/L** Analysis Date: **29-Dec-2022 18:16**
Client ID: Run ID: **ICPMS07_424997** SeqNo: **7055379** PrepDate: **29-Dec-2022** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	< 0.00200	0.0250					0.001121	0	10	

The following samples were analyzed in this batch: HS22120899-02

Client: WSP Golder
Project: Houston TX-Wood Preserving Works
WorkOrder: HS22120899

QC BATCH REPORT

Batch ID: **R424271 (0)** **Instrument:** **Balance1** **Method:** **MOISTURE - ASTM D2216**

DUP Sample ID: **HS22120795-12DUP** Units: **wt%** Analysis Date: **16-Dec-2022 11:37**
Client ID: Run ID: **Balance1_424271** SeqNo: **7038665** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Percent Moisture	16.7	0.0100					16	4.28	20	

The following samples were analyzed in this batch: HS22120899-01 HS22120899-02 HS22120899-03 HS22120899-04 HS22120899-05 HS22120899-06

Client: WSP Golder
Project: Houston TX-Wood Preserving Works
WorkOrder: **HS22120899**

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
Date	
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	22-041-0	27-Mar-2023
California	2919 2022-2023	30-Apr-2023
Dept of Defense	L21-682	31-Dec-2023
Florida	E87611-36	30-Jun-2023
Illinois	2000322022-9	09-May-2023
Kansas	E-10352; 2022-2023	31-Jul-2023
Kentucky	123043, 2022-2023	30-Apr-2023
Louisiana	03087, 2022-2023	30-Jun-2023
Maryland	343, 2022-2023	30-Jun-2023
North Carolina	624-2022	31-Dec-2022
North Carolina	624-2023	31-Dec-2023
North Dakota	R-193 2022-2023	30-Apr-2023
Oklahoma	2022-141	31-Aug-2023
Texas	T104704231-22-29	30-Apr-2023
Utah	TX026932022-13	31-Jul-2023

ALS Houston, US Date: 30-Dec-22

Sample Receipt Checklist

Work Order ID: HS22120899 **Date/Time Received:** **15-Dec-2022 14:15**

Client Name: PBW **Received by:** **Corey Grandits**

Completed By: /S/ Malcolm Burleson (eSignature) 15-Dec-2022 16:07 (Date/Time) **Reviewed by:** /S/ Dane J. Wacasey (eSignature) 20-Dec-2022 09:37 (Date/Time)

Matrices: **WATER** Carrier name: **FedEx**

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 ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:286643
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):	2.5UC / 2.0C	IR31	
Cooler(s)/Kit(s):	M RED		
Date/Time sample(s) sent to storage:	12152022 1415		
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
Houston, TX +1 281 530 5656
Middletown, PA +1 717 944 5541
Spring City, PA +1 610 948 49
Salt Lake Cit +1 801 266
Charleston, WV 56 3168
5 5280

Chain of Custody Form

Page 1 of 1

COC ID: 286643

RUSH

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	4300139407/Kevin Peterburs 1620-35	Project Name	Houston TX-Wood Preserving Works	A	ICP_S_Low (6020 Arsenic 5636002)
Work Order		Project Number	1620-34-Rev0 SR 92688	B	MOIST_ASTM (Moisture% 5631931)
Company Name	WSP Golder	Bill To Company	Union Pacific Railroad- A/P	C	
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable	D	
Address	1601 S. MoPac Expressway Suite 325D	Address	1400 Douglas Street Stop 0750	E F	
City/State/Zip	Austin, TX 78746	City/State/Zip	Omaha NE 681790750	G	
Phone	(512) 671-3434	Phone		H	
Fax	(512) 671-3446	Fax		I	
e-Mail Address	Eric_Matzner@golder.com	e-Mail Address		J	

HS22120899
WSP Golder
Houston TX-Wood Preserving Works

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	SO-1620-BLS-30(0-2.5)-20221215	12/15/22	0950	Soil	8	1	X	X									
2	" " BLS-30(2.5-15) "		1002				X	X									
3	" " BLS-31(0-2.5) "		1015				X	X									
4	" " BLS-31(7.5-10) "		1021				X	X									
5	" " BLS-31(12.5-15) "		1027				X	X									
6	" " BLS-30(7.5-10) "		1031				X	X									
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Chris Elston

Shipment Method:

Required Turnaround Time: (Check Box) [X] 3 [ ] STD 10 Wk Days [ ] 5 Wk Days [ ] 2 Wk Days [ ] 24 Hour

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
	12/15/22	1415	
Relinquished by:	Date:	Time:	Received by (Laboratory):
			12.14.22 1414
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: UPRR HWPW 1620-35

Cooler ID	Cooler Temp.
MA 021	2.5
1031	

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.