



February 5, 2020

Project No. 19119232

**Ms. Maureen Hatfield**

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

**RE: MONTHLY STATUS UPDATE – ENGLEWOOD INTERMODAL YARD – NAPL COLLECTION SYSTEM/CONCRETE CAP REPAIRS  
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), on behalf of Union Pacific Railroad Company (UPRR), is pleased to provide this monthly status update for January 2020 for the implementation of the cap repairs identified in the Updated Post-Response Action Care Report (PRACR) dated January 16, 2018 for the UPRR Houston Wood Preserving Works Facility (the Site). Monthly status updates were requested by the Texas Commission on Environmental Quality (TCEQ) in a letter dated March 20, 2018. A brief description of the current status of the repairs is provided below:

The non-aqueous phase liquid (NAPL) Collection System was installed in the Englewood Intermodal Yard to address the tar-like substance seeps within parking slots B100 to B109 (for container trailers). The following is a summary of the observations from the weekly inspections of the NAPL Collection System for January (photographs of from the weekly inspections are provided in Attachment A):

- No significant amount of NAPL has been visually observed within NAPL collection Sump 1 (B099/B100 slots), Sump 2 (B103/B104 slots), or Sump 3 (B107/B108 slots).
- Water continues to collect in the NAPL collection sumps. Water tends to collect more rapidly in Sump 1 compared to Sumps 2 or 3 following pump down events. NRC conducted a pump down of the sumps on January 8, 2020. By January 17, 2020, the water in Sump 1 had recovered to the top of the sump, whereas Sumps 2 and 3 had recovered to the top of the sump by January 28, 2020. The water in Sumps 1, 2, and 3 was observed as being brown in color with no odor or sheen. On January 8, 2020, NRC pumped approximately 18,000 gallons of fluid from the sumps and stored it in the on-site frac tank near slot B109. A sample of the frac tank water was collected on January 8, 2020 to characterize the liquids for disposal (analytical report provided in Attachment B). Once

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profiled, NRC will pump the fluids from the frac tank and plans to transport the fluids for disposal at Liquid Environmental Solutions in February 2020. The waste manifest for the disposal of the fluids will be provided in the February 2020 monthly update. Once the removal of the fluids from the frac tank occurs, a pump down of the sumps will be conducted.

- For areas outside the NAPL Collection System, very small amounts of tar-like material were noted near or within stalls B096 and B101 where previous seeps have been observed. The amount of the tar-like material seeping has significantly decreased over the past month. Less than 0.1 gallons of the tar-like material was recovered on January 7, 2020. No tar-like material was noted or recovered during the remainder of January.
- There were no water seeps noted in the Englewood Intermodal Yard area during the weekly inspections in January, similar to the inspections since September 2019.

Weekly site inspections of the NAPL Collection System and Englewood Intermodal Yard concrete pavement near the collection system will continue to be conducted. In response to the TCEQ letter dated August 9, 2019, a notation on the presence of NAPL in each sump and tabulation of depth and thickness of NAPL if detected, and a tabulation of total contaminant mass of NAPL recovered from each sump will be provided. The requested information is provided on the enclosed Table 1. Through January 2020, no NAPL has been measurable in the sumps using the interface probe.

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,

**Golder Associates Inc.**



Eric C. Matzner, P.G.  
*Principal / Program Leader*

ECM

CC: Mr. Kevin Peterburs, UPRR – Milwaukee, WI  
Ms. Alma Jefferson, Waste Section Manager, TCEQ Region 12, Houston

Attachment Table 1 – NAPL Measurements – NAPL Collection System Sumps  
Weekly Inspection Photolog  
Laboratory Analytical Report – Recovered Fluids from Sumps, sampled  
January 8, 2020

[https://golderassociates.sharepoint.com/sites/116841/project/files/6/deliverables/pracr/tceq comment letter/2020-01 january monthly update/houston, tx-wpw-sw-31547 - monthly status update - cap repairs 202001.docx](https://golderassociates.sharepoint.com/sites/116841/project/files/6/deliverables/pracr/tceq%20comment%20letter/2020-01%20january%20monthly%20update/houston,%20tx-wpw-sw-31547-monthly%20status%20update-cap%20repairs%20202001.docx)

**TABLE**

**TABLE 1**  
**NAPL Measurements - NAPL Collection System - Englewood Intermodal Yard**  
**UPRR Houston, tx - Wood Preserving Works**

Measured Date	Sump 1 (B099/B100) Freeboard (in)	Sump 2 (B103/B104) Freeboard (in)	Sump 3 (B107/B108) Freeboard (in)	Depth to DNAPL (in)	Comments
8/14/2019	2.5	28	29	Not measureable	
8/21/2019	0	27.5	26.5	Not measureable	
8/28/2019	44.5	47.9	45	Not measureable	Water from sumps pumped out
9/4/2019	19	42	41.5	Not measureable	
9/13/2019	0	39.5	38	Not measureable	
9/20/2019	0	3	2.5	Not measureable	
9/25/2019	0	42	42.5	Not measureable	Water from sumps pumped out
10/2/2019	2.5	42.5	42	Not measureable	Sheen visible in B107/B108 sump, less than 0.1 gal od DNAPL recovered
10/9/2019	3	42	41.5	Not measureable	Sheen visible in B107/B108 sump, less than 0.1 gal od DNAPL recovered
10/16/2019	0	39.5	39	Not measureable	Less than 0.1 gal of DNAPL recovered from B107/B108 Sump
10/24/2019	3	35	25	Not measureable	Less than 0.1 gal of DNAPL recovered from B107/B108 Sump
10/29/2019	0	24	23	Not measureable	Water from sumps pumped out
10/30/2019	0	40	39	Not measureable	Slight sheen visible in B107/B108 sump
11/6/2019	9	39	38.5	Not measureable	
11/13/2019	7	30	29	Not measureable	Less than 0.1 gal of DNAPL recovered from B107/B108 Sump
11/19/2019	4	26	25.5	Not measureable	
11/27/2019	0	25	23	Not measureable	
12/3/2019	2	25.5	25	Not measureable	Less than 0.1 gal of DNAPL recovered from B107/B108 Sump
12/11/2019	1.5	17	16.54	Not measureable	Less than 0.1 gal of DNAPL recovered from B107/B108 Sump
12/17/2019	5	19.5	17.5	Not measureable	
12/23/2019	10	21	20.5	Not measureable	
1/7/2020	9	13	12.5	Not measureable	
1/8/2020	9	13	12.5	Not measureable	Water from sumps pumped out
1/17/2020	0	32	31.5	Not measureable	
1/21/2020	2.5	26.5	26	Not measureable	
1/28/2020	0	0	0	Not measureable	

Note:

Freeboard in sumps is measured as depth to water from top rim of sump, measured in inches

**ATTACHMENT A**

## Weekly Inspection Photolog



# PHOTOGRAPHIC LOG

<b>Client Name:</b> Union Pacific Railroad	<b>Site Location:</b> Englewood Houston, Texas	<b>Project No.:</b> 19119232
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<b>Photo No.</b> 1	<b>Date:</b> 01/07/2020
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**Description:**

Slot A010, no tar-like material seeps observed, looking south.

Lat: 29.7855833,  
Long: -95.318375



<b>Photo No.</b> 2	<b>Date:</b> 01/07/2020
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**Description:**

Slot A021, no tar-like material seeps observed, looking south.

Lat: 29.7855917  
Long: -95.3187469





# PHOTOGRAPHIC LOG

<b>Client Name:</b> Union Pacific Railroad	<b>Site Location:</b> Englewood Houston, Texas	<b>Project No.:</b> 19119232
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<b>Photo No.</b> 3	<b>Date:</b> 01/07/2020
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**Description:**

Slot B096, very small amount of tar-like material seeping at joint, material was removed.

Lat: 29.7842528  
Long: - 95.3206250



<b>Photo No.</b> 4	<b>Date:</b> 01/07/2020
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**Description:**

Slot B057, no tar-like material seeps observed, looking north. Residual staining noted along cracks.

Lat: 29.7847472  
Long: - 95.3195417





# PHOTOGRAPHIC LOG

<b>Client Name:</b> Union Pacific Railroad	<b>Site Location:</b> Englewood Houston, Texas	<b>Project No.:</b> 19119232
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<b>Photo No.</b> 5	<b>Date:</b> 01/07/2020
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**Description:**

Slot B101, very little tar-like material seeping at crack, looking northeast.

Lat: 29.784275  
Long: - 95.320813



<b>Photo No.</b> 6	<b>Date:</b> 01/07/2020
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**Description:**

Slot B104, view of NAPL Collection System (Sump 103/104 in foreground). No tar-like material seeps observed, looking north.

Lat: 29.7841639  
Long: - 95.3208694







# PHOTOGRAPHIC LOG

**Client Name:**  
**Union Pacific Railroad**

**Site Location:**  
Englewood Houston, Texas

**Project No.**  
19119232

**Photo No.**  
**7**

**Date:**  
01/07/2020

**Description:**

Slot B109, view of NAPL Collection System (Sump 107/108 in foreground). No tar-like material seeps observed, looking northeast.

Lat: 29.784114  
Long: - 95.321018



**Photo No.**  
**8**

**Date:**  
01/07/2020

**Description:**

Frac tank for storage of pumped down water from NAPL Collection Sumps (in Slot B110), looking northwest.

Lat: 29.7841028  
Long: - 95.3209833





# PHOTOGRAPHIC LOG

<b>Client Name:</b> Union Pacific Railroad		<b>Site Location:</b> Englewood Houston, Texas	<b>Project No.:</b> 19119232
<b>Photo No.:</b> 9	<b>Date:</b> 01/17/2020		
<b>Description:</b>  Slot B013, no tar-like material seeps observed, residual water from recent rain event noted, looking north.  Lat: 29.785217 Long: - 95.318261			
<b>Photo No.:</b> 10	<b>Date:</b> 01/17/2020		
<b>Description:</b>  Slot B101, no tar-like material seeps observed, residual water from recent rain event noted, looking north.  Lat: 29.784211 Long: - 95.320769			



# PHOTOGRAPHIC LOG

**Client Name:**  
**Union Pacific Railroad**

**Site Location:**  
Englewood Houston, Texas

**Project No.**  
19119232

**Photo No.**  
**11**

**Date:**  
01/17/2020

**Description:**

Slot B096, no tar-like material seeps observed, residual water from recent rain event noted, looking north.

Lat: 29.784253  
Long: - 95.320625



**Photo No.**  
**12**

**Date:**  
01/17/2020

**Description:**

Slot B098, no tar-like material seeps observed, residual water from recent rain event noted, looking north.

Lat: 29.784231  
Long: - 95.320694





# PHOTOGRAPHIC LOG

<b>Client Name:</b> Union Pacific Railroad	<b>Site Location:</b> Englewood Houston, Texas	<b>Project No.:</b> 19119232
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<b>Photo No.</b> <b>13</b>	<b>Date:</b> 01/17/2020
<b>Description:</b>  Sump B099/B100, zero inches of freeboard in sump, no sheen or odors noted.  Lat: 29.7844000 Long: - 95.3205861	



<b>Photo No.</b> <b>14</b>	<b>Date:</b> 01/17/2020
<b>Description:</b>  Sump B107/B108, approx. 31.5 inches of freeboard in sump, no sheen or odors noted. No tar-like material noted.  Lat: 29.7842861 Long: - 95.3208611	





# PHOTOGRAPHIC LOG

<b>Client Name:</b> Union Pacific Railroad	<b>Site Location:</b> Englewood Houston, Texas	<b>Project No.:</b> 19119232
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<b>Photo No.</b> <b>15</b>	<b>Date:</b> 01/17/2020
<b>Description:</b>  Slot B105, no tar-like material seeps observed, residual water from recent rain event noted, looking north.  Lat: 29.7841472 Long: - 95.3208777	



<b>Photo No.</b> <b>16</b>	<b>Date:</b> 01/17/2020
<b>Description:</b>  Frac tank for storage of pumped down water from NAPL Collection Sumps (in Slot B110), some stormwater noted in secondary containment, looking northwest.  Lat: 29.7841028 Long: - 95.3209833	





# PHOTOGRAPHIC LOG

<b>Client Name:</b> Union Pacific Railroad	<b>Site Location:</b> Englewood Houston, Texas	<b>Project No.</b> 19119232
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<b>Photo No.</b> 17	<b>Date:</b> 01/21/2020
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**Description:**

Slot B057, no tar-like material seeps observed, looking north.

Lat: 29.7847166  
Long: - 95.3195417



<b>Photo No.</b> 18	<b>Date:</b> 01/21/2020
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**Description:**

Slot B099, view of NAPL Collection System (Sump 099/100 in foreground). No tar-like material seeps observed, looking north.

Lat: 29.7842472  
Long: - 95.3206944





# PHOTOGRAPHIC LOG

<b>Client Name:</b> Union Pacific Railroad	<b>Site Location:</b> Englewood Houston, Texas	<b>Project No.:</b> 19119232
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<b>Photo No.</b> 19	<b>Date:</b> 01/21/2020
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**Description:**

Slot B106, no tar-like material seeps observed, looking north.

Lat: 29.7841194  
Long: - 95.3209306



<b>Photo No.</b> 20	<b>Date:</b> 01/21/2020
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**Description:**

Slot B107, view of NAPL Collection System (Sump 107/108 in foreground). No tar-like material seeps observed, looking north.

Lat: 29.7841028  
Long: - 95.3209611





# PHOTOGRAPHIC LOG

<b>Client Name:</b> Union Pacific Railroad	<b>Site Location:</b> Englewood Houston, Texas	<b>Project No.:</b> 19119232
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<b>Photo No.</b> <b>21</b>	<b>Date:</b> 01/28/2020
<b>Description</b>  Sump B099/B100, zero inches of freeboard in sump, no sheen or odors noted, water from ongoing rain event noted on pavement no water flowing from sump.  Lat: 29.7844000 Long: - 95.3205861	



<b>Photo No.</b> <b>22</b>	<b>Date:</b> 01/28/2020
<b>Description:</b>  Sump B103/B104, zero inches of freeboard in sump, no sheen or odors noted, water from ongoing rain event noted on pavement, no water flowing from sump.  Lat: 29.7842861 Long: - 95.3208611	







# PHOTOGRAPHIC LOG

<b>Client Name:</b> Union Pacific Railroad	<b>Site Location:</b> Englewood Houston, Texas	<b>Project No.:</b> 19119232
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<b>Photo No.:</b> 23	<b>Date:</b> 01/28/2020
<b>Description:</b>  Slot A021, no tar-like material seeps observed, looking south, water from ongoing rain event noted on pavement.  Lat: 29.7855917 Long: -95.3187469	



<b>Photo No.:</b> 24	<b>Date:</b> 01/28/2020
<b>Description:</b>  Slot B109, no tar-like material seeps observed, looking north, water from ongoing rain event noted on pavement.  Lat: 29.7840889 Long: - 95.3210306	



**ATTACHMENT B**

Laboratory Analytical Report –  
Recovered Fluids from Sumps,  
sampled January 8, 2020



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January 17, 2020

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

Work Order: **HS20010314**

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

Dear Eric,

ALS Environmental received 1 sample(s) on Jan 08, 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: DAYNA.FISHER  
Dane J. Wacasey

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**Work Order:** HS20010314

**SAMPLE SUMMARY**

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Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20010314-01	WG-1620-FRACTANK-20200108	Water		08-Jan-2020 14:20	08-Jan-2020 17:40	<input type="checkbox"/>

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**Work Order:** HS20010314

**CASE NARRATIVE**

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**Work Order Comments**

- Sample received outside method holding time for pH. pH is an immediate test. Sample results are flagged with an "H" qualifier.  
The temperature at the time of pH is reported. Please note that all pH results are already normalized to a temperature of 25 °C.

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**GC Semivolatiles by Method TX1005****Batch ID: 149521**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

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**GCMS Semivolatiles by Method SW8270****Batch ID: 149543****Sample ID: HS20010246-12MS**

- MS and MSD are for an unrelated sample

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**GCMS Volatiles by Method SW8260****Batch ID: R354341****Sample ID: CCV**

- Bromomethane exceeded %D limits on CCV. Samples are ND for this analyte.

**Sample ID: VLCSW-200113**

- Bromomethane exceeded %recovery limits on LCS. Samples are ND for this analyte.

**Sample ID: HS20010394-01MS**

- MS and MSD are for an unrelated sample

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**Metals by Method SW6020****Batch ID: 149545****Sample ID: HS20010338-04MSD**

- MSD is for an unrelated sample

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**Metals by Method SW7470****Batch ID: 149513**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

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**WetChemistry by Method SM4500 S2-F****Batch ID: R354358**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

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**WetChemistry by Method SW1010****Batch ID: R354197**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

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**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**Work Order:** HS20010314

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**CASE NARRATIVE**

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**WetChemistry by Method SW1010**

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**WetChemistry by Method SW9040C**

**Batch ID: R354190**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
- 

**WetChemistry by Method SW9014**

**Batch ID: 149643**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-FRACTANK-20200108  
 Collection Date: 08-Jan-2020 14:20

**ANALYTICAL REPORT**  
 WorkOrder:HS20010314  
 Lab ID:HS20010314-01  
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP		
1,1,1-Trichloroethane	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
1,1,2,2-Tetrachloroethane	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
1,1,2-Trichloroethane	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
1,1-Dichloroethane	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
1,1-Dichloroethene	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
1,2-Dichlorobenzene	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
1,2-Dichloroethane	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
1,2-Dichloropropane	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
1,3-Dichlorobenzene	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
1,4-Dichlorobenzene	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
2-Butanone	< 0.0020		0.0020	mg/L	1	14-Jan-2020 03:12
2-Hexanone	< 0.0020		0.0020	mg/L	1	14-Jan-2020 03:12
4-Methyl-2-pentanone	< 0.0020		0.0020	mg/L	1	14-Jan-2020 03:12
Acetone	< 0.0020		0.0020	mg/L	1	14-Jan-2020 03:12
Benzene	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
Bromochloromethane	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
Bromodichloromethane	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
Bromoform	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
Bromomethane	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
Carbon disulfide	< 0.0020		0.0020	mg/L	1	14-Jan-2020 03:12
Carbon tetrachloride	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
Chlorobenzene	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
Chloroethane	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
Chloroform	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
Chloromethane	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
cis-1,2-Dichloroethene	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
cis-1,3-Dichloropropene	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
Dibromochloromethane	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
Ethylbenzene	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
m,p-Xylene	< 0.0020		0.0020	mg/L	1	14-Jan-2020 03:12
Methylene chloride	< 0.0020		0.0020	mg/L	1	14-Jan-2020 03:12
o-Xylene	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
Styrene	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
Tetrachloroethene	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
Toluene	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
trans-1,2-Dichloroethene	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
trans-1,3-Dichloropropene	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
Trichloroethene	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
Vinyl acetate	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12

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

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-FRACTANK-20200108  
 Collection Date: 08-Jan-2020 14:20

**ANALYTICAL REPORT**  
 WorkOrder:HS20010314  
 Lab ID:HS20010314-01  
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP		
Vinyl chloride	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
Xylenes, Total	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
1,2-Dichloroethene, Total	< 0.0010		0.0010	mg/L	1	14-Jan-2020 03:12
Surr: 1,2-Dichloroethane-d4	122		70-126	%REC	1	14-Jan-2020 03:12
Surr: 4-Bromofluorobenzene	96.8		81-113	%REC	1	14-Jan-2020 03:12
Surr: Dibromofluoromethane	112		77-123	%REC	1	14-Jan-2020 03:12
Surr: Toluene-d8	98.7		82-127	%REC	1	14-Jan-2020 03:12

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



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-FRACTANK-20200108  
 Collection Date: 08-Jan-2020 14:20

**ANALYTICAL REPORT**  
 WorkOrder:HS20010314  
 Lab ID:HS20010314-01  
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>			Prep:SW3510 / 10-Jan-2020	Analyst: GEY
1,2,4-Trichlorobenzene	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
2,4,5-Trichlorophenol	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
2,4,6-Trichlorophenol	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
2,4-Dichlorophenol	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
2,4-Dimethylphenol	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
2,4-Dinitrophenol	< 0.0010		0.0010	mg/L	1	10-Jan-2020 20:08
2,4-Dinitrotoluene	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
2,6-Dinitrotoluene	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
2-Chloronaphthalene	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
2-Chlorophenol	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
<b>2-Methylnaphthalene</b>	<b>0.00011</b>		<b>0.00010</b>	<b>mg/L</b>	1	10-Jan-2020 20:08
2-Methylphenol	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
2-Nitroaniline	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
2-Nitrophenol	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
3&4-Methylphenol	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
3,3'-Dichlorobenzidine	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
3-Nitroaniline	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
4,6-Dinitro-2-methylphenol	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
4-Bromophenyl phenyl ether	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
4-Chloro-3-methylphenol	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
4-Chloroaniline	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
4-Chlorophenyl phenyl ether	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
4-Nitroaniline	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
4-Nitrophenol	< 0.0010		0.0010	mg/L	1	10-Jan-2020 20:08
<b>Acenaphthene</b>	<b>0.00016</b>		<b>0.00010</b>	<b>mg/L</b>	1	10-Jan-2020 20:08
Acenaphthylene	< 0.00010		0.00010	mg/L	1	10-Jan-2020 20:08
Anthracene	< 0.00010		0.00010	mg/L	1	10-Jan-2020 20:08
Benz(a)anthracene	< 0.00010		0.00010	mg/L	1	10-Jan-2020 20:08
<b>Benzidine</b>	<b>0.00067</b>		<b>0.00020</b>	<b>mg/L</b>	1	10-Jan-2020 20:08
Benzo(a)pyrene	< 0.00010		0.00010	mg/L	1	10-Jan-2020 20:08
Benzo(b)fluoranthene	< 0.00010		0.00010	mg/L	1	10-Jan-2020 20:08
Benzo(g,h,i)perylene	< 0.00010		0.00010	mg/L	1	10-Jan-2020 20:08
Benzo(k)fluoranthene	< 0.00010		0.00010	mg/L	1	10-Jan-2020 20:08
Benzyl alcohol	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
Bis(2-chloroethoxy)methane	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
Bis(2-chloroethyl)ether	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
Bis(2-chloroisopropyl)ether	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.0010</b>		<b>0.00020</b>	<b>mg/L</b>	1	10-Jan-2020 20:08
Butyl benzyl phthalate	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08

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

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-FRACTANK-20200108  
 Collection Date: 08-Jan-2020 14:20

**ANALYTICAL REPORT**  
 WorkOrder:HS20010314  
 Lab ID:HS20010314-01  
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 10-Jan-2020		Analyst: GEY
Carbazole	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
Chrysene	< 0.00010		0.00010	mg/L	1	10-Jan-2020 20:08
<b>Di-n-butyl phthalate</b>	<b>0.0027</b>		<b>0.00020</b>	<b>mg/L</b>	1	10-Jan-2020 20:08
Di-n-octyl phthalate	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
Dibenz(a,h)anthracene	< 0.00010		0.00010	mg/L	1	10-Jan-2020 20:08
Dibenzofuran	< 0.00010		0.00010	mg/L	1	10-Jan-2020 20:08
<b>Diethyl phthalate</b>	<b>0.00024</b>		<b>0.00020</b>	<b>mg/L</b>	1	10-Jan-2020 20:08
Dimethyl phthalate	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
Fluoranthene	< 0.00010		0.00010	mg/L	1	10-Jan-2020 20:08
Fluorene	< 0.00010		0.00010	mg/L	1	10-Jan-2020 20:08
Hexachlorobenzene	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
Hexachlorobutadiene	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
Hexachlorocyclopentadiene	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
Hexachloroethane	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
Indeno(1,2,3-cd)pyrene	< 0.00010		0.00010	mg/L	1	10-Jan-2020 20:08
Isophorone	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
N-Nitrosodi-n-propylamine	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
N-Nitrosodimethylamine	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
N-Nitrosodiphenylamine	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
<b>Naphthalene</b>	<b>0.00016</b>		<b>0.00010</b>	<b>mg/L</b>	1	10-Jan-2020 20:08
Nitrobenzene	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
Pentachlorophenol	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
Phenanthrene	< 0.00010		0.00010	mg/L	1	10-Jan-2020 20:08
Phenol	< 0.00020		0.00020	mg/L	1	10-Jan-2020 20:08
Pyrene	< 0.00010		0.00010	mg/L	1	10-Jan-2020 20:08
Pyridine	< 0.0010		0.0010	mg/L	1	10-Jan-2020 20:08
<i>Surr: 2,4,6-Tribromophenol</i>	<i>117</i>		<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>10-Jan-2020 20:08</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>95.8</i>		<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>10-Jan-2020 20:08</i>
<i>Surr: 2-Fluorophenol</i>	<i>74.3</i>		<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>10-Jan-2020 20:08</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>109</i>		<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>10-Jan-2020 20:08</i>
<i>Surr: Nitrobenzene-d5</i>	<i>75.4</i>		<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>10-Jan-2020 20:08</i>
<i>Surr: Phenol-d6</i>	<i>75.6</i>		<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>10-Jan-2020 20:08</i>
<b>LOW-LEVEL TEXAS TPH BY TX1005</b>		<b>Method:TX1005</b>		Prep:TX1005PR / 09-Jan-2020		Analyst: MBG
nC6 to nC12	< 0.49		0.49	mg/L	1	09-Jan-2020 23:41
>nC12 to nC28	< 0.49		0.49	mg/L	1	09-Jan-2020 23:41
>nC28 to nC35	< 0.49		0.49	mg/L	1	09-Jan-2020 23:41
Total Petroleum Hydrocarbon	< 0.49		0.49	mg/L	1	09-Jan-2020 23:41
<i>Surr: 2-Fluorobiphenyl</i>	<i>92.2</i>		<i>70-130</i>	<i>%REC</i>	<i>1</i>	<i>09-Jan-2020 23:41</i>
<i>Surr: Trifluoromethyl benzene</i>	<i>106</i>		<i>70-130</i>	<i>%REC</i>	<i>1</i>	<i>09-Jan-2020 23:41</i>

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

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-FRACTANK-20200108  
 Collection Date: 08-Jan-2020 14:20

**ANALYTICAL REPORT**  
 WorkOrder:HS20010314  
 Lab ID:HS20010314-01  
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 10-Jan-2020		Analyst: JHD
Antimony	0.00377		0.00200	mg/L	1	10-Jan-2020 15:21
Arsenic	0.00349		0.00200	mg/L	1	10-Jan-2020 15:21
Barium	0.108		0.00400	mg/L	1	10-Jan-2020 15:21
Beryllium	< 0.00200		0.00200	mg/L	1	10-Jan-2020 15:21
Cadmium	< 0.00200		0.00200	mg/L	1	10-Jan-2020 15:21
Chromium	< 0.00400		0.00400	mg/L	1	10-Jan-2020 15:21
Lead	0.00480		0.00200	mg/L	1	10-Jan-2020 15:21
Nickel	0.00611		0.00200	mg/L	1	10-Jan-2020 15:21
Selenium	< 0.00200		0.00200	mg/L	1	10-Jan-2020 15:21
Silver	< 0.00200		0.00200	mg/L	1	10-Jan-2020 15:21
Vanadium	0.00765		0.00500	mg/L	1	10-Jan-2020 15:21
<b>MERCURY BY SW7470A</b>		<b>Method:SW7470</b>		Prep:SW7470 / 09-Jan-2020		Analyst: FO
Mercury	< 0.000200		0.000200	mg/L	1	09-Jan-2020 14:12
<b>SULFIDE BY SM4500 S2-F</b>		<b>Method:SM4500 S2-F</b>				Analyst: RG
Sulfide	< 1.00		1.00	mg/L	1	14-Jan-2020 10:30
<b>FLASH POINT BY PENSKEY-MARTENS SW1010A</b>		<b>Method:SW1010</b>				Analyst: TH
Ignitability	> 212		70.0	°F	1	09-Jan-2020 16:30
<b>CYANIDE - SW9014</b>		<b>Method:SW9014</b>		Prep:SW9010C / 14-Jan-2020		Analyst: KVL
Cyanide	< 0.00500		0.00500	mg/L	1	14-Jan-2020 12:30
<b>PH BY SW9040C</b>		<b>Method:SW9040C</b>				Analyst: KVL
pH	8.11	H	0.100	pH Units	1	09-Jan-2020 15:30
Temp Deg C @pH	19.3	H	0	DEG C	1	09-Jan-2020 15:30

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:** HS20010314

**Batch ID:** 149513      **Start Date:** 09 Jan 2020 10:30      **End Date:** 09 Jan 2020 12:30  
**Method:** MERCURY PREP BY 7470A- WATER      **Prep Code:** HG\_WPR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20010314-01		10 (mL)	10 (mL)	1

**Batch ID:** 149521      **Start Date:** 09 Jan 2020 13:00      **End Date:** 09 Jan 2020 15:00  
**Method:** TX 1005 PREP      **Prep Code:** TX 1005\_W PR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20010314-01	1	30.61 (g)	3 (mL)	0.09801

**Batch ID:** 149543      **Start Date:** 10 Jan 2020 07:00      **End Date:** 10 Jan 2020 13:30  
**Method:** SV AQ SEP FUN EXTRACT-LOWLEV - 3510C      **Prep Code:** 3510\_B\_LOW

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20010314-01	1	1000 (mL)	1 (mL)	0.001

**Batch ID:** 149545      **Start Date:** 10 Jan 2020 08:00      **End Date:** 10 Jan 2020 12:00  
**Method:** WATER - SW3010A      **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20010314-01		10 (mL)	10 (mL)	1

**Batch ID:** 149643      **Start Date:** 14 Jan 2020 10:00      **End Date:** 14 Jan 2020 11:30  
**Method:** CYANIDE PREP - SW9010C      **Prep Code:** CN\_TW\_PR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20010314-01		50 (mL)	50 (mL)	1

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**DATES REPORT**

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
<b>Batch ID:</b> 149513 ( 0 )		<b>Test Name :</b> MERCURY BY SW7470A			<b>Matrix:</b> Water	
HS20010314-01	WG-1620-FRACTANK-20200108	08 Jan 2020 14:20		09 Jan 2020 10:30	09 Jan 2020 14:12	1
<b>Batch ID:</b> 149521 ( 0 )		<b>Test Name :</b> LOW-LEVEL TEXAS TPH BY TX1005			<b>Matrix:</b> Water	
HS20010314-01	WG-1620-FRACTANK-20200108	08 Jan 2020 14:20		09 Jan 2020 13:00	09 Jan 2020 23:41	1
<b>Batch ID:</b> 149543 ( 0 )		<b>Test Name :</b> LOW-LEVEL SEMIVOLATILES BY 8270D			<b>Matrix:</b> Water	
HS20010314-01	WG-1620-FRACTANK-20200108	08 Jan 2020 14:20		10 Jan 2020 09:23	10 Jan 2020 20:08	1
<b>Batch ID:</b> 149545 ( 0 )		<b>Test Name :</b> ICP-MS METALS BY SW6020A			<b>Matrix:</b> Water	
HS20010314-01	WG-1620-FRACTANK-20200108	08 Jan 2020 14:20		10 Jan 2020 08:00	10 Jan 2020 15:21	1
<b>Batch ID:</b> 149643 ( 0 )		<b>Test Name :</b> CYANIDE - SW9014			<b>Matrix:</b> Water	
HS20010314-01	WG-1620-FRACTANK-20200108	08 Jan 2020 14:20		14 Jan 2020 10:00	14 Jan 2020 12:30	1
<b>Batch ID:</b> R354190 ( 0 )		<b>Test Name :</b> PH BY SW9040C			<b>Matrix:</b> Water	
HS20010314-01	WG-1620-FRACTANK-20200108	08 Jan 2020 14:20			09 Jan 2020 15:30	1
<b>Batch ID:</b> R354197 ( 0 )		<b>Test Name :</b> FLASH POINT BY PENSKY-MARTENS SW1010A			<b>Matrix:</b> Water	
HS20010314-01	WG-1620-FRACTANK-20200108	08 Jan 2020 14:20			09 Jan 2020 16:30	1
<b>Batch ID:</b> R354341 ( 0 )		<b>Test Name :</b> LOW LEVEL VOLATILES BY SW8260C			<b>Matrix:</b> Water	
HS20010314-01	WG-1620-FRACTANK-20200108	08 Jan 2020 14:20			14 Jan 2020 03:12	1
<b>Batch ID:</b> R354358 ( 0 )		<b>Test Name :</b> SULFIDE BY SM4500 S2-F			<b>Matrix:</b> Water	
HS20010314-01	WG-1620-FRACTANK-20200108	08 Jan 2020 14:20			14 Jan 2020 10:30	1

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

Batch ID: 149521 ( 0 )		Instrument: FID-10		Method: LOW-LEVEL TEXAS TPH BY TX1005						
<b>MBLK</b>	Sample ID: <b>MBLK-149521</b>	Units: <b>mg/L</b>			Analysis Date: <b>09-Jan-2020 20:43</b>					
Client ID:	Run ID: <b>FID-10_354169</b>	SeqNo: <b>5430828</b>		PrepDate: <b>09-Jan-2020</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	< 0.50	0.50								
>nC12 to nC28	< 0.50	0.50								
>nC28 to nC35	< 0.50	0.50								
Total Petroleum Hydrocarbon	< 0.50	0.50								
Surr: 2-Fluorobiphenyl	2.128	0	2.5	0	85.1	70 - 130				
Surr: Trifluoromethyl benzene	2.263	0	2.5	0	90.5	70 - 130				
<b>LCS</b>	Sample ID: <b>LCS-149521</b>	Units: <b>mg/L</b>			Analysis Date: <b>09-Jan-2020 21:13</b>					
Client ID:	Run ID: <b>FID-10_354169</b>	SeqNo: <b>5430829</b>		PrepDate: <b>09-Jan-2020</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	23.01	0.50	25	0	92.0	75 - 125				
>nC12 to nC28	20.58	0.50	25	0	82.3	75 - 125				
Surr: 2-Fluorobiphenyl	2.787	0	2.5	0	111	70 - 130				
Surr: Trifluoromethyl benzene	2.388	0	2.5	0	95.5	70 - 130				
<b>LCSD</b>	Sample ID: <b>LCSD-149521</b>	Units: <b>mg/L</b>			Analysis Date: <b>09-Jan-2020 21:42</b>					
Client ID:	Run ID: <b>FID-10_354169</b>	SeqNo: <b>5430830</b>		PrepDate: <b>09-Jan-2020</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	25.42	0.50	25	0	102	75 - 125	23.01	9.94	20	
>nC12 to nC28	22.25	0.50	25	0	89.0	75 - 125	20.58	7.8	20	
Surr: 2-Fluorobiphenyl	2.668	0	2.5	0	107	70 - 130	2.787	4.37	20	
Surr: Trifluoromethyl benzene	2.397	0	2.5	0	95.9	70 - 130	2.388	0.365	20	
<b>MS</b>	Sample ID: <b>HS20010349-01MS</b>	Units: <b>mg/L</b>			Analysis Date: <b>09-Jan-2020 22:42</b>					
Client ID:	Run ID: <b>FID-10_354169</b>	SeqNo: <b>5430832</b>		PrepDate: <b>09-Jan-2020</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	24.12	0.48	23.89	0	101	75 - 125				
>nC12 to nC28	19.92	0.48	23.89	0	83.4	75 - 125				
Surr: 2-Fluorobiphenyl	2.681	0	2.389	0	112	70 - 130				
Surr: Trifluoromethyl benzene	2.418	0	2.389	0	101	70 - 130				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

**Batch ID:** 149521 ( 0 )      **Instrument:** FID-10      **Method:** LOW-LEVEL TEXAS TPH BY TX1005

<b>MSD</b>		Sample ID: <b>HS20010349-01MSD</b>			Units: <b>mg/L</b>		Analysis Date: <b>09-Jan-2020 23:11</b>			
Client ID:		Run ID: <b>FID-10_354169</b>			SeqNo: <b>5430833</b>		PrepDate: <b>09-Jan-2020</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	25.62	0.49	24.27	0	106	75 - 125	24.12	6.02	20	
>nC12 to nC28	20.18	0.49	24.27	0	83.1	75 - 125	19.92	1.3	20	
<i>Surr: 2-Fluorobiphenyl</i>	2.547	0	2.427	0	105	70 - 130	2.681	5.12	20	
<i>Surr: Trifluoromethyl benzene</i>	2.335	0	2.427	0	96.2	70 - 130	2.418	3.51	20	

The following samples were analyzed in this batch: HS20010314-01

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

<b>Batch ID:</b> 149513 ( 0 )	<b>Instrument:</b> HG03	<b>Method:</b> MERCURY BY SW7470A
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<b>MBLK</b>	Sample ID: <b>MBLK-149513</b>	Units: <b>mg/L</b>	Analysis Date: <b>09-Jan-2020 13:36</b>							
Client ID:	Run ID: <b>HG03_354149</b>	SeqNo: <b>5430593</b>	PrepDate: <b>09-Jan-2020</b> DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual

Mercury < 0.000200 0.000200

<b>LCS</b>	Sample ID: <b>LCS-149513</b>	Units: <b>mg/L</b>	Analysis Date: <b>09-Jan-2020 13:38</b>							
Client ID:	Run ID: <b>HG03_354149</b>	SeqNo: <b>5430594</b>	PrepDate: <b>09-Jan-2020</b> DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual

Mercury 0.00525 0.000200 0.005 0 105 80 - 120

<b>MS</b>	Sample ID: <b>HS20010246-12MS</b>	Units: <b>mg/L</b>	Analysis Date: <b>09-Jan-2020 13:41</b>							
Client ID:	Run ID: <b>HG03_354149</b>	SeqNo: <b>5430596</b>	PrepDate: <b>09-Jan-2020</b> DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual

Mercury 0.00513 0.000200 0.005 0.000005 102 75 - 125

<b>MSD</b>	Sample ID: <b>HS20010246-12MSD</b>	Units: <b>mg/L</b>	Analysis Date: <b>09-Jan-2020 13:43</b>							
Client ID:	Run ID: <b>HG03_354149</b>	SeqNo: <b>5430597</b>	PrepDate: <b>09-Jan-2020</b> DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual

Mercury 0.00515 0.000200 0.005 0.000005 103 75 - 125 0.00513 0.389 20

The following samples were analyzed in this batch: HS20010314-01



**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

**Batch ID:** 149545 ( 0 )      **Instrument:** ICPMS04      **Method:** ICP-MS METALS BY SW6020A

<b>MBLK</b>		Sample ID: <b>MBLK-149545</b>		Units: <b>mg/L</b>		Analysis Date: <b>10-Jan-2020 14:40</b>			
Client ID:		Run ID: <b>ICPMS04_354180</b>		SeqNo: <b>5431778</b>		PrepDate: <b>10-Jan-2020</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Antimony	< 0.00200	0.00200							
Arsenic	< 0.00200	0.00200							
Barium	< 0.00400	0.00400							
Beryllium	< 0.00200	0.00200							
Cadmium	< 0.00200	0.00200							
Chromium	< 0.00400	0.00400							
Lead	< 0.00200	0.00200							
Nickel	< 0.00200	0.00200							
Selenium	< 0.00200	0.00200							
Silver	< 0.00200	0.00200							
Vanadium	< 0.00500	0.00500							

<b>LCS</b>		Sample ID: <b>LCS-149545</b>		Units: <b>mg/L</b>		Analysis Date: <b>10-Jan-2020 14:42</b>			
Client ID:		Run ID: <b>ICPMS04_354180</b>		SeqNo: <b>5431779</b>		PrepDate: <b>10-Jan-2020</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Antimony	0.04891	0.00200	0.05	0	97.8	80 - 120			
Arsenic	0.05091	0.00200	0.05	0	102	80 - 120			
Barium	0.0493	0.00400	0.05	0	98.6	80 - 120			
Beryllium	0.05087	0.00200	0.05	0	102	80 - 120			
Cadmium	0.05076	0.00200	0.05	0	102	80 - 120			
Chromium	0.0477	0.00400	0.05	0	95.4	80 - 120			
Lead	0.04825	0.00200	0.05	0	96.5	80 - 120			
Nickel	0.05044	0.00200	0.05	0	101	80 - 120			
Selenium	0.0526	0.00200	0.05	0	105	80 - 120			
Silver	0.04747	0.00200	0.05	0	94.9	80 - 120			
Vanadium	0.04887	0.00500	0.05	0	97.7	80 - 120			

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

Batch ID: 149545 ( 0 )		Instrument: ICPMS04			Method: ICP-MS METALS BY SW6020A					
<b>MS</b>	Sample ID: <b>HS20010338-04MS</b>	Units: <b>mg/L</b>			Analysis Date: <b>10-Jan-2020 15:07</b>					
Client ID:	Run ID: <b>ICPMS04_354180</b>	SeqNo: <b>5432021</b>		PrepDate: <b>10-Jan-2020</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05121	0.00200	0.05	-0.000238	103	80 - 120				
Arsenic	0.05522	0.00200	0.05	0.000977	108	80 - 120				
Barium	0.4092	0.00400	0.05	0.3627	93.0	80 - 120				O
Beryllium	0.0562	0.00200	0.05	0.000275	112	80 - 120				
Cadmium	0.05152	0.00200	0.05	0.000024	103	80 - 120				
Chromium	0.05347	0.00400	0.05	0.003358	100	80 - 120				
Lead	0.04959	0.00200	0.05	0.00004	99.1	80 - 120				
Nickel	0.05046	0.00200	0.05	0.000715	99.5	80 - 120				
Selenium	0.05388	0.00200	0.05	0.000688	106	80 - 120				
Silver	0.04683	0.00200	0.05	0.000018	93.6	80 - 120				
Vanadium	0.05836	0.00500	0.05	0.005282	106	80 - 120				

<b>MSD</b>	Sample ID: <b>HS20010338-04MSD</b>	Units: <b>mg/L</b>			Analysis Date: <b>10-Jan-2020 15:09</b>					
Client ID:	Run ID: <b>ICPMS04_354180</b>	SeqNo: <b>5432022</b>		PrepDate: <b>10-Jan-2020</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05181	0.00200	0.05	-0.000238	104	80 - 120	0.05121	1.17	20	
Arsenic	0.05684	0.00200	0.05	0.000977	112	80 - 120	0.05522	2.89	20	
Barium	0.429	0.00400	0.05	0.3627	133	80 - 120	0.4092	4.72	20	SO
Beryllium	0.05768	0.00200	0.05	0.000275	115	80 - 120	0.0562	2.59	20	
Cadmium	0.05357	0.00200	0.05	0.000024	107	80 - 120	0.05152	3.9	20	
Chromium	0.05417	0.00400	0.05	0.003358	102	80 - 120	0.05347	1.3	20	
Lead	0.0519	0.00200	0.05	0.00004	104	80 - 120	0.04959	4.57	20	
Nickel	0.05104	0.00200	0.05	0.000715	101	80 - 120	0.05046	1.14	20	
Selenium	0.05752	0.00200	0.05	0.000688	114	80 - 120	0.05388	6.53	20	
Silver	0.04803	0.00200	0.05	0.000018	96.0	80 - 120	0.04683	2.53	20	
Vanadium	0.0594	0.00500	0.05	0.005282	108	80 - 120	0.05836	1.76	20	

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

**Batch ID:** 149545 ( 0 )      **Instrument:** ICPMS04      **Method:** ICP-MS METALS BY SW6020A

<b>PDS</b>		Sample ID: <b>HS20010338-04PDS</b>			Units: <b>mg/L</b>		Analysis Date: <b>10-Jan-2020 15:11</b>			
Client ID:		Run ID: <b>ICPMS04_354180</b>			SeqNo: <b>5432023</b>		PrepDate: <b>10-Jan-2020</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09494	0.00200	0.1	-0.000238	95.2	75 - 125				
Arsenic	0.1198	0.00200	0.1	0.000977	119	75 - 125				
Barium	0.4542	0.00400	0.1	0.3627	91.5	75 - 125				
Beryllium	0.1139	0.00200	0.1	0.000275	114	75 - 125				
Cadmium	0.1101	0.00200	0.1	0.000024	110	75 - 125				
Chromium	0.1117	0.00400	0.1	0.003358	108	75 - 125				
Lead	0.109	0.00200	0.1	0.00004	109	75 - 125				
Nickel	0.1079	0.00200	0.1	0.000715	107	75 - 125				
Selenium	0.12	0.00200	0.1	0.000688	119	75 - 125				
Silver	0.08446	0.00200	0.1	0.000018	84.4	75 - 125				
Vanadium	0.1189	0.00500	0.1	0.005282	114	75 - 125				

<b>SD</b>		Sample ID: <b>HS20010338-04SD</b>			Units: <b>mg/L</b>		Analysis Date: <b>10-Jan-2020 15:05</b>			
Client ID:		Run ID: <b>ICPMS04_354180</b>			SeqNo: <b>5432020</b>		PrepDate: <b>10-Jan-2020</b>		DF: <b>5</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	< 0.0100	0.0100					-0.000238	0	10	
Arsenic	< 0.0100	0.0100					0.000977	0	10	
Barium	0.3495	0.0200					0.3627	3.64	10	
Beryllium	< 0.0100	0.0100					0.000275	0	10	
Cadmium	< 0.0100	0.0100					0.000024	0	10	
Chromium	0.003739	0.0200					0.003358	0	10	J
Lead	< 0.0100	0.0100					0.00004	0	10	
Nickel	< 0.0100	0.0100					0.000715	0	10	
Selenium	< 0.0100	0.0100					0.000688	0	10	
Silver	< 0.0100	0.0100					0.000018	0	10	
Vanadium	0.007652	0.0250					0.005282	0	10	J

The following samples were analyzed in this batch: HS20010314-01

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

Batch ID: 149543 ( 0 )		Instrument: SV-7		Method: LOW-LEVEL SEMIVOLATILES BY 8270D						
MBLK	Sample ID: MBLK-149543	Units: ug/L			Analysis Date: 10-Jan-2020 11:22					
Client ID:	Run ID: SV-7_354206	SeqNo: 5431508	PrepDate: 10-Jan-2020	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	< 0.20	0.20								
2,4,5-Trichlorophenol	< 0.20	0.20								
2,4,6-Trichlorophenol	< 0.20	0.20								
2,4-Dichlorophenol	< 0.20	0.20								
2,4-Dimethylphenol	< 0.20	0.20								
2,4-Dinitrophenol	< 1.0	1.0								
2,4-Dinitrotoluene	< 0.20	0.20								
2,6-Dinitrotoluene	< 0.20	0.20								
2-Chloronaphthalene	< 0.20	0.20								
2-Chlorophenol	< 0.20	0.20								
2-Methylnaphthalene	< 0.10	0.10								
2-Methylphenol	< 0.20	0.20								
2-Nitroaniline	< 0.20	0.20								
2-Nitrophenol	< 0.20	0.20								
3&4-Methylphenol	< 0.20	0.20								
3,3'-Dichlorobenzidine	< 0.20	0.20								
3-Nitroaniline	< 0.20	0.20								
4,6-Dinitro-2-methylphenol	< 0.20	0.20								
4-Bromophenyl phenyl ether	< 0.20	0.20								
4-Chloro-3-methylphenol	< 0.20	0.20								
4-Chloroaniline	< 0.20	0.20								
4-Chlorophenyl phenyl ether	< 0.20	0.20								
4-Nitroaniline	< 0.20	0.20								
4-Nitrophenol	< 1.0	1.0								
Acenaphthene	< 0.10	0.10								
Acenaphthylene	< 0.10	0.10								
Anthracene	< 0.10	0.10								
Benz(a)anthracene	< 0.10	0.10								
Benzidine	< 0.20	0.20								
Benzo(a)pyrene	< 0.10	0.10								
Benzo(b)fluoranthene	< 0.10	0.10								
Benzo(g,h,i)perylene	< 0.10	0.10								
Benzo(k)fluoranthene	< 0.10	0.10								
Benzyl alcohol	< 0.20	0.20								

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

Batch ID: 149543 ( 0 )		Instrument: SV-7		Method: LOW-LEVEL SEMIVOLATILES BY 8270D						
MBLK	Sample ID: MBLK-149543	Units: ug/L			Analysis Date: 10-Jan-2020 11:22					
Client ID:	Run ID: SV-7_354206	SeqNo: 5431508	PrepDate: 10-Jan-2020	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bis(2-chloroethoxy)methane	< 0.20	0.20								
Bis(2-chloroethyl)ether	< 0.20	0.20								
Bis(2-chloroisopropyl)ether	< 0.20	0.20								
Bis(2-ethylhexyl)phthalate	< 0.20	0.20								
Butyl benzyl phthalate	< 0.20	0.20								
Carbazole	< 0.20	0.20								
Chrysene	< 0.10	0.10								
Dibenz(a,h)anthracene	< 0.10	0.10								
Dibenzofuran	< 0.10	0.10								
Diethyl phthalate	< 0.20	0.20								
Dimethyl phthalate	< 0.20	0.20								
Di-n-butyl phthalate	< 0.20	0.20								
Di-n-octyl phthalate	< 0.20	0.20								
Fluoranthene	< 0.10	0.10								
Fluorene	< 0.10	0.10								
Hexachlorobenzene	< 0.20	0.20								
Hexachlorobutadiene	< 0.20	0.20								
Hexachlorocyclopentadiene	< 0.20	0.20								
Hexachloroethane	< 0.20	0.20								
Indeno(1,2,3-cd)pyrene	< 0.10	0.10								
Isophorone	< 0.20	0.20								
Naphthalene	< 0.10	0.10								
Nitrobenzene	< 0.20	0.20								
N-Nitrosodimethylamine	< 0.20	0.20								
N-Nitrosodi-n-propylamine	< 0.20	0.20								
N-Nitrosodiphenylamine	< 0.20	0.20								
Pentachlorophenol	< 0.20	0.20								
Phenanthrene	< 0.10	0.10								
Phenol	< 0.20	0.20								
Pyrene	< 0.10	0.10								
Pyridine	< 1.0	1.0								
Surr: 2,4,6-Tribromophenol	4.677	0.20	5	0	93.5	34 - 129				
Surr: 2-Fluorobiphenyl	5.373	0.20	5	0	107	40 - 125				
Surr: 2-Fluorophenol	4.78	0.20	5	0	95.6	20 - 120				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

Batch ID: 149543 ( 0 )		Instrument: SV-7		Method: LOW-LEVEL SEMIVOLATILES BY 8270D						
MBLK	Sample ID: MBLK-149543	Units: ug/L			Analysis Date: 10-Jan-2020 11:22					
Client ID:	Run ID: SV-7_354206	SeqNo: 5431508		PrepDate: 10-Jan-2020		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Surr: 4-Terphenyl-d14	5.387	0.20	5	0	108	40 - 135				
Surr: Nitrobenzene-d5	4.362	0.20	5	0	87.2	41 - 120				
Surr: Phenol-d6	4.713	0.20	5	0	94.3	20 - 120				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

Batch ID: 149543 ( 0 )		Instrument: SV-7		Method: LOW-LEVEL SEMIVOLATILES BY 8270D						
LCS	Sample ID: LCS-149543	Units: ug/L			Analysis Date: 10-Jan-2020 11:02					
Client ID:	Run ID: SV-7_354206	SeqNo: 5431507	PrepDate: 10-Jan-2020	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	4.624	0.20	5	0	92.5	45 - 120				
2,4,5-Trichlorophenol	4.928	0.20	5	0	98.6	46 - 120				
2,4,6-Trichlorophenol	4.506	0.20	5	0	90.1	42 - 120				
2,4-Dichlorophenol	4.875	0.20	5	0	97.5	49 - 120				
2,4-Dimethylphenol	3.969	0.20	5	0	79.4	35 - 120				
2,4-Dinitrophenol	3.858	1.0	5	0	77.2	15 - 120				
2,4-Dinitrotoluene	4.785	0.20	5	0	95.7	50 - 122				
2,6-Dinitrotoluene	5.199	0.20	5	0	104	50 - 120				
2-Chloronaphthalene	5.22	0.20	5	0	104	50 - 120				
2-Chlorophenol	4.697	0.20	5	0	93.9	40 - 120				
2-Methylnaphthalene	5.127	0.10	5	0	103	50 - 120				
2-Methylphenol	4.156	0.20	5	0	83.1	45 - 120				
2-Nitroaniline	5.564	0.20	5	0	111	28 - 139				
2-Nitrophenol	4.771	0.20	5	0	95.4	40 - 120				
3&4-Methylphenol	4.293	0.20	5	0	85.9	35 - 120				
3,3'-Dichlorobenzidine	5.756	0.20	5	0	115	15 - 120				
3-Nitroaniline	5.757	0.20	5	0	115	30 - 120				
4,6-Dinitro-2-methylphenol	5.525	0.20	5	0	111	25 - 121				
4-Bromophenyl phenyl ether	4.96	0.20	5	0	99.2	45 - 120				
4-Chloro-3-methylphenol	4.948	0.20	5	0	99.0	47 - 120				
4-Chloroaniline	5.543	0.20	5	0	111	20 - 120				
4-Chlorophenyl phenyl ether	4.713	0.20	5	0	94.3	50 - 120				
4-Nitroaniline	5.721	0.20	5	0	114	30 - 133				
4-Nitrophenol	4.302	1.0	5	0	86.0	30 - 130				
Acenaphthene	5.056	0.10	5	0	101	45 - 120				
Acenaphthylene	5.253	0.10	5	0	105	47 - 120				
Anthracene	5.307	0.10	5	0	106	45 - 120				
Benz(a)anthracene	4.941	0.10	5	0	98.8	40 - 120				
Benzidine	2.765	0.20	5	0	55.3	10 - 120				
Benzo(a)pyrene	5.067	0.10	5	0	101	45 - 120				
Benzo(b)fluoranthene	4.905	0.10	5	0	98.1	50 - 120				
Benzo(g,h,i)perylene	4.349	0.10	5	0	87.0	42 - 127				
Benzo(k)fluoranthene	6.065	0.10	5	0	121	45 - 127				
Benzyl alcohol	4.214	0.20	5	0	84.3	35 - 122				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

Batch ID: 149543 ( 0 )		Instrument: SV-7		Method: LOW-LEVEL SEMIVOLATILES BY 8270D						
LCS	Sample ID: LCS-149543	Units: ug/L			Analysis Date: 10-Jan-2020 11:02					
Client ID:	Run ID: SV-7_354206	SeqNo: 5431507	PrepDate: 10-Jan-2020	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bis(2-chloroethoxy)methane	3.495	0.20	5	0	69.9	45 - 120				
Bis(2-chloroethyl)ether	4.588	0.20	5	0	91.8	37 - 121				
Bis(2-chloroisopropyl)ether	4.254	0.20	5	0	85.1	40 - 120				
Bis(2-ethylhexyl)phthalate	6.191	0.20	5	0	124	40 - 139				
Butyl benzyl phthalate	6.102	0.20	5	0	122	47 - 123				
Carbazole	4.667	0.20	5	0	93.3	42 - 128				
Chrysene	5.961	0.10	5	0	119	43 - 120				
Dibenz(a,h)anthracene	4.834	0.10	5	0	96.7	45 - 125				
Dibenzofuran	5.049	0.10	5	0	101	50 - 120				
Diethyl phthalate	5.43	0.20	5	0	109	41 - 120				
Dimethyl phthalate	5.207	0.20	5	0	104	40 - 122				
Di-n-butyl phthalate	6.073	0.20	5	0	121	45 - 123				
Di-n-octyl phthalate	6.297	0.20	5	0	126	45 - 129				
Fluoranthene	5.282	0.10	5	0	106	45 - 125				
Fluorene	5.131	0.10	5	0	103	49 - 120				
Hexachlorobenzene	5.303	0.20	5	0	106	48 - 120				
Hexachlorobutadiene	4.199	0.20	5	0	84.0	40 - 120				
Hexachlorocyclopentadiene	3.683	0.20	5	0	73.7	34 - 136				
Hexachloroethane	4.801	0.20	5	0	96.0	40 - 120				
Indeno(1,2,3-cd)pyrene	5.879	0.10	5	0	118	41 - 128				
Isophorone	3.747	0.20	5	0	74.9	40 - 121				
Naphthalene	5.393	0.10	5	0	108	45 - 120				
Nitrobenzene	3.874	0.20	5	0	77.5	44 - 120				
N-Nitrosodimethylamine	3.429	0.20	5	0	68.6	30 - 121				
N-Nitrosodi-n-propylamine	3.453	0.20	5	0	69.1	40 - 120				
N-Nitrosodiphenylamine	5.56	0.20	5	0	111	40 - 125				
Pentachlorophenol	3.103	0.20	5	0	62.1	19 - 121				
Phenanthrene	5.394	0.10	5	0	108	45 - 121				
Phenol	4.012	0.20	5	0	80.2	20 - 124				
Pyrene	5.788	0.10	5	0	116	40 - 130				
Pyridine	3.14	1.0	5	0	62.8	15 - 120				
Surr: 2,4,6-Tribromophenol	5.097	0.20	5	0	102	34 - 129				
Surr: 2-Fluorobiphenyl	5.306	0.20	5	0	106	40 - 125				
Surr: 2-Fluorophenol	4.808	0.20	5	0	96.2	20 - 120				



**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

Batch ID: 149543 ( 0 )		Instrument: SV-7		Method: LOW-LEVEL SEMIVOLATILES BY 8270D						
<b>LCS</b>	Sample ID: <b>LCS-149543</b>	Units: <b>ug/L</b>			Analysis Date: <b>10-Jan-2020 11:02</b>					
Client ID:	Run ID: <b>SV-7_354206</b>	SeqNo: <b>5431507</b>		PrepDate: <b>10-Jan-2020</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
<i>Surr: 4-Terphenyl-d14</i>	5.406	0.20	5	0	108	40 - 135				
<i>Surr: Nitrobenzene-d5</i>	3.968	0.20	5	0	79.4	41 - 120				
<i>Surr: Phenol-d6</i>	3.965	0.20	5	0	79.3	20 - 120				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

Batch ID: 149543 ( 0 )		Instrument: SV-7		Method: LOW-LEVEL SEMIVOLATILES BY 8270D						
MS	Sample ID: HS20010246-12MS	Units: ug/L			Analysis Date: 10-Jan-2020 19:09					
Client ID:	Run ID: SV-7_354206	SeqNo: 5432909	PrepDate: 10-Jan-2020	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	4.991	0.20	5	0	99.8	45 - 120				
2,4,5-Trichlorophenol	3.792	0.20	5	0	75.8	46 - 120				
2,4,6-Trichlorophenol	4.005	0.20	5	0	80.1	42 - 120				
2,4-Dichlorophenol	5.781	0.20	5	0	116	49 - 120				
2,4-Dimethylphenol	42.88	0.20	5	29.33	271	35 - 120				SEO
2,4-Dinitrophenol	2.307	1.0	5	0	46.1	15 - 120				
2,4-Dinitrotoluene	3.388	0.20	5	0	67.8	50 - 122				
2,6-Dinitrotoluene	3.761	0.20	5	0	75.2	50 - 120				
2-Chloronaphthalene	4.029	0.20	5	0	80.6	50 - 120				
2-Chlorophenol	5.38	0.20	5	0	108	40 - 120				
2-Methylnaphthalene	290.9	0.10	5	244.1	936	50 - 120				SEO
2-Methylphenol	5.084	0.20	5	0.6421	88.8	45 - 120				
2-Nitroaniline	2.13	0.20	5	0	42.6	28 - 139				
2-Nitrophenol	5.593	0.20	5	0	112	40 - 120				
3&4-Methylphenol	5.223	0.20	5	0.3348	97.8	35 - 120				
3,3'-Dichlorobenzidine	< 0.20	0.20	5	0	0	15 - 120				S
3-Nitroaniline	1.86	0.20	5	0	37.2	30 - 120				
4,6-Dinitro-2-methylphenol	4.75	0.20	5	0	95.0	25 - 121				
4-Bromophenyl phenyl ether	4.403	0.20	5	0	88.1	45 - 120				
4-Chloro-3-methylphenol	3.33	0.20	5	0	66.6	47 - 120				
4-Chloroaniline	1.755	0.20	5	0	35.1	20 - 120				
4-Chlorophenyl phenyl ether	3.093	0.20	5	0	61.9	50 - 120				
4-Nitroaniline	1.023	0.20	5	0	20.5	30 - 133				S
4-Nitrophenol	1.785	1.0	5	0	35.7	30 - 130				
Acenaphthene	228.4	0.10	5	236.3	-157	45 - 120				SEO
Acenaphthylene	5.425	0.10	5	0	108	47 - 120				
Anthracene	21.64	0.10	5	13.7	159	45 - 120				SE
Benz(a)anthracene	4.807	0.10	5	0.371	88.7	40 - 120				
Benzidine	2.518	0.20	5	0	50.4	10 - 120				
Benzo(a)pyrene	5.427	0.10	5	0.182	105	45 - 120				
Benzo(b)fluoranthene	5.446	0.10	5	0.2186	105	50 - 120				
Benzo(g,h,i)perylene	5.497	0.10	5	0.05385	109	42 - 127				
Benzo(k)fluoranthene	5.977	0.10	5	0.1275	117	45 - 127				
Benzyl alcohol	4.808	0.20	5	0	96.2	35 - 122				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

Batch ID: 149543 ( 0 )		Instrument: SV-7		Method: LOW-LEVEL SEMIVOLATILES BY 8270D						
MS	Sample ID: HS20010246-12MS	Units: ug/L			Analysis Date: 10-Jan-2020 19:09					
Client ID:	Run ID: SV-7_354206	SeqNo: 5432909	PrepDate: 10-Jan-2020	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bis(2-chloroethoxy)methane	5.873	0.20	5	0	117	45 - 120				
Bis(2-chloroethyl)ether	4.022	0.20	5	0	80.4	37 - 121				
Bis(2-chloroisopropyl)ether	5.309	0.20	5	0	106	40 - 120				
Bis(2-ethylhexyl)phthalate	5.865	0.20	5	0	117	40 - 139				
Butyl benzyl phthalate	5.534	0.20	5	0	111	47 - 123				
Carbazole	179.9	0.20	5	199.6	-395	42 - 128				SEO
Chrysene	5.529	0.10	5	0.3775	103	43 - 120				
Dibenz(a,h)anthracene	6.253	0.10	5	0	125	45 - 125				S
Dibenzofuran	143.6	0.10	5	136.2	148	50 - 120				SEO
Diethyl phthalate	4.304	0.20	5	0	86.1	41 - 120				
Dimethyl phthalate	3.973	0.20	5	0	79.5	40 - 122				
Di-n-butyl phthalate	5.592	0.20	5	0	112	45 - 123				
Di-n-octyl phthalate	6.528	0.20	5	0	131	45 - 129				S
Fluoranthene	16.2	0.10	5	10.46	115	45 - 125				E
Fluorene	155	0.10	5	163.3	-167	49 - 120				SEO
Hexachlorobenzene	4.564	0.20	5	0	91.3	48 - 120				
Hexachlorobutadiene	4.237	0.20	5	0	84.7	40 - 120				
Hexachlorocyclopentadiene	2.392	0.20	5	0	47.8	34 - 136				
Hexachloroethane	4.305	0.20	5	0	86.1	40 - 120				
Indeno(1,2,3-cd)pyrene	5.528	0.10	5	0	111	41 - 128				
Isophorone	4.725	0.20	5	0	94.5	40 - 121				
Naphthalene	268.1	0.10	5	221.9	923	45 - 120				SEO
Nitrobenzene	3.531	0.20	5	0	70.6	44 - 120				
N-Nitrosodimethylamine	2.656	0.20	5	0	53.1	30 - 121				
N-Nitrosodi-n-propylamine	4.23	0.20	5	0	84.6	40 - 120				
N-Nitrosodiphenylamine	7.332	0.20	5	0	147	40 - 125				S
Pentachlorophenol	4.017	0.20	5	0	80.3	19 - 121				
Phenanthrene	135.7	0.10	5	139.7	-79.6	45 - 121				SEO
Phenol	4.737	0.20	5	0	94.7	20 - 124				
Pyrene	9.132	0.10	5	5.301	76.6	40 - 130				
Pyridine	2.552	1.0	5	0	51.0	15 - 120				
Surr: 2,4,6-Tribromophenol	4.348	0.20	5	0	87.0	34 - 129				
Surr: 2-Fluorobiphenyl	4.101	0.20	5	0	82.0	40 - 125				
Surr: 2-Fluorophenol	4.855	0.20	5	0	97.1	20 - 120				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

Batch ID: 149543 ( 0 )		Instrument: SV-7		Method: LOW-LEVEL SEMIVOLATILES BY 8270D						
<b>MS</b>	Sample ID: <b>HS20010246-12MS</b>	Units: <b>ug/L</b>			Analysis Date: <b>10-Jan-2020 19:09</b>					
Client ID:	Run ID: <b>SV-7_354206</b>	SeqNo: <b>5432909</b>		PrepDate: <b>10-Jan-2020</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
<i>Surr: 4-Terphenyl-d14</i>	4.864	0.20	5	0	97.3	40 - 135				
<i>Surr: Nitrobenzene-d5</i>	5.589	0.20	5	0	112	41 - 120				
<i>Surr: Phenol-d6</i>	4.427	0.20	5	0	88.5	20 - 120				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

Batch ID: 149543 ( 0 )		Instrument: SV-7			Method: LOW-LEVEL SEMIVOLATILES BY 8270D					
MSD	Sample ID: HS20010246-12MSD	Units: ug/L			Analysis Date: 10-Jan-2020 19:29					
Client ID:	Run ID: SV-7_354206	SeqNo: 5432910		PrepDate: 10-Jan-2020		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	5.172	0.20	5	0	103	45 - 120	4.991	3.56	20	
2,4,5-Trichlorophenol	3.929	0.20	5	0	78.6	46 - 120	3.792	3.56	20	
2,4,6-Trichlorophenol	4.086	0.20	5	0	81.7	42 - 120	4.005	2	20	
2,4-Dichlorophenol	5.957	0.20	5	0	119	49 - 120	5.781	2.99	20	
2,4-Dimethylphenol	44.87	0.20	5	29.33	311	35 - 120	42.88	4.53	20	SEO
2,4-Dinitrophenol	2.281	1.0	5	0	45.6	15 - 120	2.307	1.14	50	
2,4-Dinitrotoluene	4.636	0.20	5	0	92.7	50 - 122	3.388	31.1	20	R
2,6-Dinitrotoluene	3.382	0.20	5	0	67.6	50 - 120	3.761	10.6	20	
2-Chloronaphthalene	4.588	0.20	5	0	91.8	50 - 120	4.029	13	20	
2-Chlorophenol	5.6	0.20	5	0	112	40 - 120	5.38	4	20	
2-Methylnaphthalene	260	0.10	5	244.1	319	50 - 120	290.9	11.2	20	SEO
2-Methylphenol	5.055	0.20	5	0.6421	88.3	45 - 120	5.084	0.576	20	
2-Nitroaniline	2.2	0.20	5	0	44.0	28 - 139	2.13	3.22	20	
2-Nitrophenol	5.872	0.20	5	0	117	40 - 120	5.593	4.86	20	
3&4-Methylphenol	5.113	0.20	5	0.3348	95.6	35 - 120	5.223	2.11	20	
3,3'-Dichlorobenzidine	< 0.20	0.20	5	0	0	15 - 120	0	0	20	S
3-Nitroaniline	1.334	0.20	5	0	26.7	30 - 120	1.86	32.9	20	SR
4,6-Dinitro-2-methylphenol	4.906	0.20	5	0	98.1	25 - 121	4.75	3.22	30	
4-Bromophenyl phenyl ether	5.388	0.20	5	0	108	45 - 120	4.403	20.1	20	R
4-Chloro-3-methylphenol	1.509	0.20	5	0	30.2	47 - 120	3.33	75.2	20	SR
4-Chloroaniline	0.8816	0.20	5	0	17.6	20 - 120	1.755	66.3	20	SR
4-Chlorophenyl phenyl ether	3.348	0.20	5	0	67.0	50 - 120	3.093	7.92	20	
4-Nitroaniline	2.029	0.20	5	0	40.6	30 - 133	1.023	66	20	R
4-Nitrophenol	4.625	1.0	5	0	92.5	30 - 130	1.785	88.6	20	R
Acenaphthene	245.9	0.10	5	236.3	192	45 - 120	228.4	7.35	20	SEO
Acenaphthylene	5.864	0.10	5	0	117	47 - 120	5.425	7.79	20	
Anthracene	20.51	0.10	5	13.7	136	45 - 120	21.64	5.37	20	SE
Benz(a)anthracene	5.01	0.10	5	0.371	92.8	40 - 120	4.807	4.12	20	
Benzidine	2.305	0.20	5	0	46.1	10 - 120	2.518	8.84	30	
Benzo(a)pyrene	5.475	0.10	5	0.182	106	45 - 120	5.427	0.891	20	
Benzo(b)fluoranthene	5.215	0.10	5	0.2186	99.9	50 - 120	5.446	4.35	20	
Benzo(g,h,i)perylene	5.36	0.10	5	0.05385	106	42 - 127	5.497	2.53	20	
Benzo(k)fluoranthene	6.255	0.10	5	0.1275	123	45 - 127	5.977	4.55	20	
Benzyl alcohol	4.768	0.20	5	0	95.4	35 - 122	4.808	0.838	20	

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

Batch ID: 149543 ( 0 )		Instrument: SV-7		Method: LOW-LEVEL SEMIVOLATILES BY 8270D							
MSD	Sample ID: HS20010246-12MSD	Units: ug/L			Analysis Date: 10-Jan-2020 19:29						
Client ID:	Run ID: SV-7_354206	SeqNo: 5432910	PrepDate: 10-Jan-2020	DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Bis(2-chloroethoxy)methane	6.166	0.20	5	0	123	45 - 120	5.873	4.88	20	S	
Bis(2-chloroethyl)ether	4.353	0.20	5	0	87.1	37 - 121	4.022	7.92	20		
Bis(2-chloroisopropyl)ether	5.838	0.20	5	0	117	40 - 120	5.309	9.49	20		
Bis(2-ethylhexyl)phthalate	5.91	0.20	5	0	118	40 - 139	5.865	0.769	20		
Butyl benzyl phthalate	5.508	0.20	5	0	110	47 - 123	5.534	0.482	20		
Carbazole	205.9	0.20	5	199.6	126	42 - 128	179.9	13.5	20	EO	
Chrysene	5.886	0.10	5	0.3775	110	43 - 120	5.529	6.26	20		
Dibenz(a,h)anthracene	6.383	0.10	5	0	128	45 - 125	6.253	2.06	20	S	
Dibenzofuran	153.7	0.10	5	136.2	350	50 - 120	143.6	6.81	20	SEO	
Diethyl phthalate	3.762	0.20	5	0	75.2	41 - 120	4.304	13.5	20		
Dimethyl phthalate	3.467	0.20	5	0	69.3	40 - 122	3.973	13.6	20		
Di-n-butyl phthalate	5.212	0.20	5	0	104	45 - 123	5.592	7.02	20		
Di-n-octyl phthalate	6.049	0.20	5	0	121	45 - 129	6.528	7.61	20		
Fluoranthene	14.67	0.10	5	10.46	84.1	45 - 125	16.2	9.94	20	E	
Fluorene	165.8	0.10	5	163.3	50.5	49 - 120	155	6.78	20	EO	
Hexachlorobenzene	6.009	0.20	5	0	120	48 - 120	4.564	27.3	20	SR	
Hexachlorobutadiene	4.48	0.20	5	0	89.6	40 - 120	4.237	5.57	20		
Hexachlorocyclopentadiene	2.635	0.20	5	0	52.7	34 - 136	2.392	9.67	20		
Hexachloroethane	3.565	0.20	5	0	71.3	40 - 120	4.305	18.8	20		
Indeno(1,2,3-cd)pyrene	5.215	0.10	5	0	104	41 - 128	5.528	5.83	20		
Isophorone	4.365	0.20	5	0	87.3	40 - 121	4.725	7.91	20		
Naphthalene	229.7	0.10	5	221.9	155	45 - 120	268.1	15.4	20	SEO	
Nitrobenzene	3.099	0.20	5	0	62.0	44 - 120	3.531	13	20		
N-Nitrosodimethylamine	3.057	0.20	5	0	61.1	30 - 121	2.656	14.1	20		
N-Nitrosodi-n-propylamine	3.891	0.20	5	0	77.8	40 - 120	4.23	8.34	20		
N-Nitrosodiphenylamine	8.614	0.20	5	0	172	40 - 125	7.332	16.1	20	S	
Pentachlorophenol	4.859	0.20	5	0	97.2	19 - 121	4.017	19	20		
Phenanthrene	151.6	0.10	5	139.7	237	45 - 121	135.7	11	20	SEO	
Phenol	4.669	0.20	5	0	93.4	20 - 124	4.737	1.45	20		
Pyrene	11.05	0.10	5	5.301	115	40 - 130	9.132	19	20	E	
Pyridine	2.825	1.0	5	0	56.5	15 - 120	2.552	10.2	20		
Surr: 2,4,6-Tribromophenol	5.214	0.20	5	0	104	34 - 129	4.348	18.1	20		
Surr: 2-Fluorobiphenyl	4.096	0.20	5	0	81.9	40 - 125	4.101	0.119	20		
Surr: 2-Fluorophenol	5.089	0.20	5	0	102	20 - 120	4.855	4.71	20		

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

Batch ID: 149543 ( 0 )		Instrument: SV-7		Method: LOW-LEVEL SEMIVOLATILES BY 8270D						
<b>MSD</b>	Sample ID: <b>HS20010246-12MSD</b>	Units: <b>ug/L</b>			Analysis Date: <b>10-Jan-2020 19:29</b>					
Client ID:	Run ID: <b>SV-7_354206</b>	SeqNo: <b>5432910</b>		PrepDate: <b>10-Jan-2020</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
<i>Surr: 4-Terphenyl-d14</i>	5.562	0.20	5	0	111	40 - 135	4.864	13.4	20	
<i>Surr: Nitrobenzene-d5</i>	4.462	0.20	5	0	89.2	41 - 120	5.589	22.4	20	R
<i>Surr: Phenol-d6</i>	4.507	0.20	5	0	90.1	20 - 120	4.427	1.8	20	

The following samples were analyzed in this batch: HS20010314-01

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

Batch ID: R354341 ( 0 )		Instrument: VOA4		Method: LOW LEVEL VOLATILES BY SW8260C						
MBLK	Sample ID: VBLKW-200113	Units: ug/L			Analysis Date: 14-Jan-2020 00:20					
Client ID:	Run ID: VOA4_354341	SeqNo: 5433935	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	< 1.0	1.0								
1,1,2,2-Tetrachloroethane	< 1.0	1.0								
1,1,2-Trichloroethane	< 1.0	1.0								
1,1-Dichloroethane	< 1.0	1.0								
1,1-Dichloroethene	< 1.0	1.0								
1,2-Dichlorobenzene	< 1.0	1.0								
1,2-Dichloroethane	< 1.0	1.0								
1,2-Dichloropropane	< 1.0	1.0								
1,3-Dichlorobenzene	< 1.0	1.0								
1,4-Dichlorobenzene	< 1.0	1.0								
2-Butanone	< 2.0	2.0								
2-Hexanone	< 2.0	2.0								
4-Methyl-2-pentanone	< 2.0	2.0								
Acetone	< 2.0	2.0								
Benzene	< 1.0	1.0								
Bromochloromethane	< 1.0	1.0								
Bromodichloromethane	< 1.0	1.0								
Bromoform	< 1.0	1.0								
Bromomethane	< 1.0	1.0								
Carbon disulfide	< 2.0	2.0								
Carbon tetrachloride	< 1.0	1.0								
Chlorobenzene	< 1.0	1.0								
Chloroethane	< 1.0	1.0								
Chloroform	< 1.0	1.0								
Chloromethane	< 1.0	1.0								
cis-1,2-Dichloroethene	< 1.0	1.0								
cis-1,3-Dichloropropene	< 1.0	1.0								
Dibromochloromethane	< 1.0	1.0								
Ethylbenzene	< 1.0	1.0								
m,p-Xylene	< 2.0	2.0								
Methylene chloride	< 2.0	2.0								
o-Xylene	< 1.0	1.0								
Styrene	< 1.0	1.0								
Tetrachloroethene	< 1.0	1.0								



**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

Batch ID: R354341 ( 0 )		Instrument: VOA4		Method: LOW LEVEL VOLATILES BY SW8260C						
MBLK	Sample ID: VBLKW-200113	Units: ug/L			Analysis Date: 14-Jan-2020 00:20					
Client ID:	Run ID: VOA4_354341	SeqNo: 5433935		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Toluene	< 1.0	1.0								
trans-1,2-Dichloroethene	< 1.0	1.0								
trans-1,3-Dichloropropene	< 1.0	1.0								
Trichloroethene	< 1.0	1.0								
Vinyl acetate	< 1.0	1.0								
Vinyl chloride	< 1.0	1.0								
Xylenes, Total	< 1.0	1.0								
1,2-Dichloroethene, Total	< 1.0	1.0								
<i>Surr: 1,2-Dichloroethane-d4</i>	57.22	1.0	50	0	114	70 - 123				
<i>Surr: 4-Bromofluorobenzene</i>	50.31	1.0	50	0	101	82 - 115				
<i>Surr: Dibromofluoromethane</i>	52.96	1.0	50	0	106	73 - 126				
<i>Surr: Toluene-d8</i>	47.91	1.0	50	0	95.8	81 - 120				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

Batch ID: R354341 ( 0 )		Instrument: VOA4		Method: LOW LEVEL VOLATILES BY SW8260C						
LCS	Sample ID: VLCSW-200113	Units: ug/L			Analysis Date: 13-Jan-2020 23:31					
Client ID:	Run ID: VOA4_354341	SeqNo: 5433934	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	22.64	1.0	20	0	113	70 - 130				
1,1,2,2-Tetrachloroethane	20.02	1.0	20	0	100	70 - 120				
1,1,2-Trichloroethane	19.77	1.0	20	0	98.8	77 - 113				
1,1-Dichloroethane	22.53	1.0	20	0	113	71 - 122				
1,1-Dichloroethene	20.77	1.0	20	0	104	70 - 130				
1,2-Dichlorobenzene	19.25	1.0	20	0	96.2	77 - 113				
1,2-Dichloroethane	21.31	1.0	20	0	107	70 - 124				
1,2-Dichloropropane	21.88	1.0	20	0	109	72 - 119				
1,3-Dichlorobenzene	19.38	1.0	20	0	96.9	78 - 118				
1,4-Dichlorobenzene	20.62	1.0	20	0	103	79 - 113				
2-Butanone	41.36	2.0	40	0	103	70 - 130				
2-Hexanone	38.05	2.0	40	0	95.1	70 - 130				
4-Methyl-2-pentanone	41.43	2.0	40	0	104	70 - 130				
Acetone	47.17	2.0	40	0	118	70 - 130				
Benzene	20.37	1.0	20	0	102	74 - 120				
Bromochloromethane	20.26	1.0	20	0	101	76 - 124				
Bromodichloromethane	21.33	1.0	20	0	107	74 - 122				
Bromoform	19.36	1.0	20	0	96.8	73 - 128				
Bromomethane	28.14	1.0	20	0	141	70 - 130				S
Carbon disulfide	42.69	2.0	40	0	107	70 - 130				
Carbon tetrachloride	19.44	1.0	20	0	97.2	71 - 125				
Chlorobenzene	18.58	1.0	20	0	92.9	76 - 113				
Chloroethane	23.81	1.0	20	0	119	70 - 130				
Chloroform	22.86	1.0	20	0	114	71 - 121				
Chloromethane	24.02	1.0	20	0	120	70 - 129				
cis-1,2-Dichloroethene	21.33	1.0	20	0	107	75 - 122				
cis-1,3-Dichloropropene	21.29	1.0	20	0	106	73 - 127				
Dibromochloromethane	20.14	1.0	20	0	101	77 - 122				
Ethylbenzene	19.36	1.0	20	0	96.8	77 - 117				
m,p-Xylene	39.38	2.0	40	0	98.4	77 - 122				
Methylene chloride	22.25	2.0	20	0	111	70 - 127				
o-Xylene	19.2	1.0	20	0	96.0	75 - 119				
Styrene	21.33	1.0	20	0	107	72 - 126				
Tetrachloroethene	19.6	1.0	20	0	98.0	76 - 119				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

**Batch ID:** R354341 ( 0 )      **Instrument:** VOA4      **Method:** LOW LEVEL VOLATILES BY SW8260C

LCS		Sample ID: VLCSW-200113			Units: ug/L		Analysis Date: 13-Jan-2020 23:31			
Client ID:		Run ID: VOA4_354341			SeqNo: 5433934		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Toluene	20.29	1.0	20	0	101	77 - 118				
trans-1,2-Dichloroethene	21.6	1.0	20	0	108	72 - 127				
trans-1,3-Dichloropropene	21.36	1.0	20	0	107	77 - 119				
Trichloroethene	19.37	1.0	20	0	96.8	77 - 121				
Vinyl acetate	41.84	1.0	40	0	105	70 - 130				
Vinyl chloride	21.91	1.0	20	0	110	70 - 130				
Xylenes, Total	58.58	1.0	60	0	97.6	75 - 122				
1,2-Dichloroethene, Total	42.93	1.0	40	0	107	72 - 127				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>59.5</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>119</i>	<i>70 - 130</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>50.29</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>55.76</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>112</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>49.18</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.4</i>	<i>81 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

Batch ID: R354341 ( 0 )		Instrument: VOA4		Method: LOW LEVEL VOLATILES BY SW8260C						
MS	Sample ID: HS20010394-01MS	Units: ug/L			Analysis Date: 14-Jan-2020 01:58					
Client ID:	Run ID: VOA4_354341	SeqNo: 5433939	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	21.6	1.0	20	0	108	70 - 130				
1,1,2,2-Tetrachloroethane	17.68	1.0	20	0	88.4	70 - 123				
1,1,2-Trichloroethane	17.88	1.0	20	0	89.4	70 - 117				
1,1-Dichloroethane	19.47	1.0	20	0	97.4	70 - 127				
1,1-Dichloroethene	18.74	1.0	20	0	93.7	70 - 130				
1,2-Dichlorobenzene	17.61	1.0	20	0	88.1	70 - 115				
1,2-Dichloroethane	20.54	1.0	20	0	103	70 - 127				
1,2-Dichloropropane	19.85	1.0	20	0	99.3	70 - 122				
1,3-Dichlorobenzene	17.9	1.0	20	0	89.5	70 - 119				
1,4-Dichlorobenzene	18.46	1.0	20	0	92.3	70 - 114				
2-Butanone	36.6	2.0	40	0	91.5	70 - 130				
2-Hexanone	33.89	2.0	40	0	84.7	70 - 130				
4-Methyl-2-pentanone	41.18	2.0	40	0	103	70 - 130				
Acetone	43.87	2.0	40	0	110	70 - 130				
Benzene	19.12	1.0	20	0	95.6	70 - 127				
Bromochloromethane	17.88	1.0	20	0	89.4	70 - 127				
Bromodichloromethane	18.74	1.0	20	0	93.7	70 - 124				
Bromoform	17.83	1.0	20	0	89.1	70 - 129				
Bromomethane	29.97	1.0	20	0	150	70 - 130				S
Carbon disulfide	37.34	2.0	40	0	93.4	70 - 130				
Carbon tetrachloride	20.19	1.0	20	0	101	70 - 130				
Chlorobenzene	18	1.0	20	0	90.0	70 - 114				
Chloroethane	29.77	1.0	20	0	149	70 - 130				S
Chloroform	20.59	1.0	20	0	103	70 - 125				
Chloromethane	26.99	1.0	20	0	135	70 - 130				S
cis-1,2-Dichloroethene	19.41	1.0	20	0	97.1	70 - 128				
cis-1,3-Dichloropropene	18.38	1.0	20	0	91.9	70 - 125				
Dibromochloromethane	17.99	1.0	20	0	90.0	70 - 124				
Ethylbenzene	18.67	1.0	20	0	93.4	70 - 124				
m,p-Xylene	39.48	2.0	40	0	98.7	70 - 130				
Methylene chloride	18.29	2.0	20	0	91.5	70 - 128				
o-Xylene	19.05	1.0	20	0	95.2	70 - 124				
Styrene	19.68	1.0	20	0	98.4	70 - 130				
Tetrachloroethene	18.94	1.0	20	0	94.7	70 - 130				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

Batch ID: R354341 ( 0 )		Instrument: VOA4		Method: LOW LEVEL VOLATILES BY SW8260C						
MS	Sample ID: HS20010394-01MS	Units: ug/L			Analysis Date: 14-Jan-2020 01:58					
Client ID:	Run ID: VOA4_354341	SeqNo: 5433939		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Toluene	19.75	1.0	20	0	98.8	70 - 123				
trans-1,2-Dichloroethene	19.45	1.0	20	0	97.2	70 - 130				
trans-1,3-Dichloropropene	18.31	1.0	20	0	91.5	70 - 121				
Trichloroethene	21.25	1.0	20	1.325	99.6	70 - 129				
Vinyl acetate	31.59	1.0	40	0	79.0	70 - 130				
Vinyl chloride	26.49	1.0	20	0	132	70 - 130				S
Xylenes, Total	58.53	1.0	60	0	97.5	70 - 130				
1,2-Dichloroethene, Total	38.86	1.0	40	0	97.1	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>56.73</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>113</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>51.18</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>102</i>	<i>81 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>56.47</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>113</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>50.64</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>82 - 127</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

Batch ID: R354341 ( 0 )		Instrument: VOA4		Method: LOW LEVEL VOLATILES BY SW8260C						
MSD	Sample ID: HS20010394-01MSD	Units: ug/L			Analysis Date: 14-Jan-2020 02:23					
Client ID:	Run ID: VOA4_354341	SeqNo: 5433940		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	20.22	1.0	20	0	101	70 - 130	21.6	6.6	20	
1,1,2,2-Tetrachloroethane	17.33	1.0	20	0	86.7	70 - 123	17.68	1.99	20	
1,1,2-Trichloroethane	16.92	1.0	20	0	84.6	70 - 117	17.88	5.48	20	
1,1-Dichloroethane	19.38	1.0	20	0	96.9	70 - 127	19.47	0.493	20	
1,1-Dichloroethene	18.12	1.0	20	0	90.6	70 - 130	18.74	3.38	20	
1,2-Dichlorobenzene	17.03	1.0	20	0	85.1	70 - 115	17.61	3.38	20	
1,2-Dichloroethane	20.29	1.0	20	0	101	70 - 127	20.54	1.2	20	
1,2-Dichloropropane	19.29	1.0	20	0	96.5	70 - 122	19.85	2.89	20	
1,3-Dichlorobenzene	17.98	1.0	20	0	89.9	70 - 119	17.9	0.435	20	
1,4-Dichlorobenzene	18.93	1.0	20	0	94.6	70 - 114	18.46	2.54	20	
2-Butanone	36.61	2.0	40	0	91.5	70 - 130	36.6	0.0211	20	
2-Hexanone	35.19	2.0	40	0	88.0	70 - 130	33.89	3.76	20	
4-Methyl-2-pentanone	39.25	2.0	40	0	98.1	70 - 130	41.18	4.81	20	
Acetone	40.86	2.0	40	0	102	70 - 130	43.87	7.11	20	
Benzene	18.32	1.0	20	0	91.6	70 - 127	19.12	4.29	20	
Bromochloromethane	18.2	1.0	20	0	91.0	70 - 127	17.88	1.77	20	
Bromodichloromethane	18.57	1.0	20	0	92.9	70 - 124	18.74	0.933	20	
Bromoform	16.59	1.0	20	0	82.9	70 - 129	17.83	7.2	20	
Bromomethane	28.82	1.0	20	0	144	70 - 130	29.97	3.93	20	S
Carbon disulfide	35.71	2.0	40	0	89.3	70 - 130	37.34	4.47	20	
Carbon tetrachloride	17.93	1.0	20	0	89.7	70 - 130	20.19	11.8	20	
Chlorobenzene	17.46	1.0	20	0	87.3	70 - 114	18	3.06	20	
Chloroethane	25.99	1.0	20	0	130	70 - 130	29.77	13.6	20	
Chloroform	19.96	1.0	20	0	99.8	70 - 125	20.59	3.08	20	
Chloromethane	27.33	1.0	20	0	137	70 - 130	26.99	1.24	20	S
cis-1,2-Dichloroethene	18.65	1.0	20	0	93.3	70 - 128	19.41	3.97	20	
cis-1,3-Dichloropropene	18.19	1.0	20	0	90.9	70 - 125	18.38	1.09	20	
Dibromochloromethane	16.87	1.0	20	0	84.4	70 - 124	17.99	6.44	20	
Ethylbenzene	18.54	1.0	20	0	92.7	70 - 124	18.67	0.718	20	
m,p-Xylene	38	2.0	40	0	95.0	70 - 130	39.48	3.81	20	
Methylene chloride	17.79	2.0	20	0	89.0	70 - 128	18.29	2.77	20	
o-Xylene	19.43	1.0	20	0	97.2	70 - 124	19.05	1.98	20	
Styrene	19.2	1.0	20	0	96.0	70 - 130	19.68	2.44	20	
Tetrachloroethene	17.52	1.0	20	0	87.6	70 - 130	18.94	7.77	20	

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

**Batch ID:** R354341 ( 0 )      **Instrument:** VOA4      **Method:** LOW LEVEL VOLATILES BY SW8260C

MSD		Sample ID: HS20010394-01MSD			Units: ug/L		Analysis Date: 14-Jan-2020 02:23			
Client ID:		Run ID: VOA4_354341			SeqNo: 5433940		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Toluene	19.03	1.0	20	0	95.2	70 - 123	19.75	3.69	20	
trans-1,2-Dichloroethene	19.22	1.0	20	0	96.1	70 - 130	19.45	1.17	20	
trans-1,3-Dichloropropene	18.24	1.0	20	0	91.2	70 - 121	18.31	0.366	20	
Trichloroethene	20.98	1.0	20	1.325	98.3	70 - 129	21.25	1.25	20	
Vinyl acetate	31.99	1.0	40	0	80.0	70 - 130	31.59	1.26	20	
Vinyl chloride	24.26	1.0	20	0	121	70 - 130	26.49	8.79	20	
Xylenes, Total	57.43	1.0	60	0	95.7	70 - 130	58.53	1.89	20	
1,2-Dichloroethene, Total	37.87	1.0	40	0	94.7	70 - 130	38.86	2.56	20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>57.46</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>115</i>	<i>70 - 126</i>	<i>56.73</i>	<i>1.29</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>50.41</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>81 - 113</i>	<i>51.18</i>	<i>1.51</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>54.34</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>109</i>	<i>77 - 123</i>	<i>56.47</i>	<i>3.85</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>48.94</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.9</i>	<i>82 - 127</i>	<i>50.64</i>	<i>3.42</i>	<i>20</i>	

The following samples were analyzed in this batch: HS20010314-01

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

<b>Batch ID:</b> 149643 ( 0 )	<b>Instrument:</b> UV-2450	<b>Method:</b> CYANIDE - SW9014
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<b>MBLK</b>	Sample ID: <b>MBLK-149643</b>	Units: <b>mg/L</b>	Analysis Date: <b>14-Jan-2020 12:30</b>							
Client ID:	Run ID: <b>UV-2450_354375</b>	SeqNo: <b>5434630</b>	PrepDate: <b>14-Jan-2020</b> DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual

Cyanide < 0.00500 0.00500

<b>LCS</b>	Sample ID: <b>LCS-149643</b>	Units: <b>mg/L</b>	Analysis Date: <b>14-Jan-2020 12:30</b>							
Client ID:	Run ID: <b>UV-2450_354375</b>	SeqNo: <b>5434629</b>	PrepDate: <b>14-Jan-2020</b> DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual

Cyanide 0.193 0.00500 0.2 0 96.5 80 - 120

<b>MS</b>	Sample ID: <b>HS20010314-01MS</b>	Units: <b>mg/L</b>	Analysis Date: <b>14-Jan-2020 12:30</b>							
Client ID: <b>WG-1620-FRACTANK-20200108</b>	Run ID: <b>UV-2450_354375</b>	SeqNo: <b>5434627</b>	PrepDate: <b>14-Jan-2020</b> DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual

Cyanide 0.184 0.00500 0.2 0.001 91.5 80 - 120

<b>MSD</b>	Sample ID: <b>HS20010314-01MSD</b>	Units: <b>mg/L</b>	Analysis Date: <b>14-Jan-2020 12:30</b>							
Client ID: <b>WG-1620-FRACTANK-20200108</b>	Run ID: <b>UV-2450_354375</b>	SeqNo: <b>5434628</b>	PrepDate: <b>14-Jan-2020</b> DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual

Cyanide 0.182 0.00500 0.2 0.001 90.5 80 - 120 0.184 1.09 20

The following samples were analyzed in this batch: HS20010314-01



**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

<b>Batch ID:</b> R354190 ( 0 )		<b>Instrument:</b> WetChem_HS		<b>Method:</b> PH BY SW9040C					
<b>DUP</b>	Sample ID: <b>HS20010215-07DUP</b>	Units: <b>pH Units</b>			Analysis Date: <b>09-Jan-2020 15:30</b>				
Client ID:	Run ID: <b>WetChem_HS_354190</b>	SeqNo: <b>5431242</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

pH	7.03	0.100					7.04	0.142	10
Temp Deg C @pH	19.3	0					19.3	0	10

The following samples were analyzed in this batch:

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

**Batch ID:** R354197 ( 0 )      **Instrument:** WetChem\_HS      **Method:** FLASH POINT BY PENSKY-MARTENS SW1010A

**LCS**      Sample ID: **LCS-R354197**      Units: °F      Analysis Date: **09-Jan-2020 16:30**  
 Client ID:      Run ID: **WetChem\_HS\_354197** SeqNo: **5431334** PrepDate:      DF: 1  
 Analyte      Result      PQL      SPK Val      SPK Ref Value      %REC      Control Limit      RPD Ref Value      %RPD      RPD Limit Qual

Ignitability      81.39      70.0      81      0      100      95 - 105

**DUP**      Sample ID: **HS20010215-01DUP**      Units: °F      Analysis Date: **09-Jan-2020 16:30**  
 Client ID:      Run ID: **WetChem\_HS\_354197** SeqNo: **5431335** PrepDate:      DF: 1  
 Analyte      Result      PQL      SPK Val      SPK Ref Value      %REC      Control Limit      RPD Ref Value      %RPD      RPD Limit Qual

Ignitability      > 212      70.0                               0      0 20

The following samples were analyzed in this batch:

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QC BATCH REPORT**

**Batch ID:** R354358 ( 0 )      **Instrument:** WetChem\_HS      **Method:** SULFIDE BY SM4500 S2-F

**MBLK**      Sample ID: **MBLK-R354358**      Units: **mg/L**      Analysis Date: **14-Jan-2020 10:30**  
 Client ID:      Run ID: **WetChem\_HS\_354358** SeqNo: **5434271**      PrepDate:      DF: **1**  
 Analyte      Result      PQL      SPK Val      SPK Ref Value      %REC      Control Limit      RPD Ref Value      %RPD      RPD Limit Qual

Sulfide      < 1.00      1.00

**LCS**      Sample ID: **LCS-R354358**      Units: **mg/L**      Analysis Date: **14-Jan-2020 10:30**  
 Client ID:      Run ID: **WetChem\_HS\_354358** SeqNo: **5434270**      PrepDate:      DF: **1**  
 Analyte      Result      PQL      SPK Val      SPK Ref Value      %REC      Control Limit      RPD Ref Value      %RPD      RPD Limit Qual

Sulfide      23.16      1.00      25      0      92.6      85 - 115

**LCSD**      Sample ID: **LCSD-R354358**      Units: **mg/L**      Analysis Date: **14-Jan-2020 10:30**  
 Client ID:      Run ID: **WetChem\_HS\_354358** SeqNo: **5434269**      PrepDate:      DF: **1**  
 Analyte      Result      PQL      SPK Val      SPK Ref Value      %REC      Control Limit      RPD Ref Value      %RPD      RPD Limit Qual

Sulfide      23.36      1.00      25      0      93.4      85 - 115      23.16      0.86      20

**MS**      Sample ID: **HS20010470-01MS**      Units: **mg/L**      Analysis Date: **14-Jan-2020 10:30**  
 Client ID:      Run ID: **WetChem\_HS\_354358** SeqNo: **5434272**      PrepDate:      DF: **1**  
 Analyte      Result      PQL      SPK Val      SPK Ref Value      %REC      Control Limit      RPD Ref Value      %RPD      RPD Limit Qual

Sulfide      25.56      1.00      25      -0.04      102      80 - 120

The following samples were analyzed in this batch: HS20010314-01

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS20010314

**QUALIFIERS,  
ACRONYMS, UNITS**

<b>Qualifier</b>	<b>Description</b>
*	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

<b>Acronym</b>	<b>Description</b>
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 Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

<b>Unit Reported</b>	<b>Description</b>
mg/L	Milligrams per Liter

**CERTIFICATIONS,ACCREDITATIONS & LICENSES**

<b>Agency</b>	<b>Number</b>	<b>Expire Date</b>
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-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 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: HS20010314

Date/Time Received: **08-Jan-2020 17:40**  
 Received by: **JRM**

Checklist completed by: Nilesh D. Ranchod 8-Jan-2020  
 eSignature Date

Reviewed by: Dane J. Wacasey 9-Jan-2020  
 eSignature Date

Matrices: **Water**

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  1 Page(s)
- Chain of custody signed when relinquished and received? Yes  No  COC IDs:215925
- 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):  IR #

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage:

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 1

COC ID: 215925

HS20010314

Golder Associates Inc.  
Houston TX-Wood Preserving Works



Customer Information		Project Information		ALS Project Manager:	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	A	8260_LL_W (5632528 Volatile Organics)
Work Order		Project Number	1620-09-Rev0 (IDWW)	B	TX1005_W_Low (5643233 TPH TX1005)
Company Name	Golder Associates Inc.	Bill To Company	Union Pacific Railroad- A/P	C	8270_LOW_W (5632532 SemiVolatiles (w/pyridine))
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable	D	ICP_TW (5652643 5652646 RCRA 8+4 Metals)
Address	2201 Double Creek Drive Suite 4004	Address	1400 Douglas Street Stop 0750	E	CN_TW_9014 (5632370 Cyanide - RCI)
				F	SULFD_4500S F (5636267 Sulfide - RCI)
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Omaha NE 681790750	G	pH_W_9040C (5632436 pH - RCI)
Phone	(512) 671-3434	Phone		H	IGN_W (5652637 Ignitability - RCI)
Fax	(512) 671-3446	Fax		I	
e-Mail Address	Eric_Matzner@golder.com	e-Mail Address		J	

*Per Golder MSA*

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	<i>WG-1620-FRACTANK-2020108</i>	<i>1-8-20</i>	<i>1420</i>	Water	1,2,4,8	12	X	X	X	X	X	X	X	X			
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign <i>Blake Skora</i>		Shipment Method		Required Turnaround Time: (Check Box) <input checked="" type="checkbox"/> <i>6/20/20</i> <input checked="" type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour			Other: <u>7-DAYS</u>		Results Due Date:	
Relinquished by: <i>Blake Skora</i>	Date: <u>1-8-20</u>	Time: <u>17:40</u>	Received by:		Notes: UPRR Houston HWPW 1620					
Relinquished by:	Date: <u>1/8/20</u>	Time: <u>17:40</u>	Received by (Laboratory): <i>J. Matzner</i>		Cooler ID: <u>43261</u>	Cooler Temp.: <u>UC</u>	QC Package: (Check One Box Below)			
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):		<input checked="" type="checkbox"/> Level II Std QC	<input type="checkbox"/> TRRP Checklist				
Preservative Key: 1-HCl 2-HNO <sub>3</sub> 3-H <sub>2</sub> SO <sub>4</sub> 4-NaOH 5-Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> 6-NaHSO <sub>4</sub> 7-Other 8-4°C 9-5035					<input type="checkbox"/> Level III Std QC/Raw Date	<input type="checkbox"/> TRRP Level IV				
					<input type="checkbox"/> Level IV SW846/CLP					

- 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.

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