



ENVIRONMENTAL TROUBLESHOOTERS, INC.

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January 22, 2020

John T. Hunt P.G.
Hydrogeologist – Remediation and Redevelopment
Wisconsin Department of Natural Resources
223 East Steinfest Road
Antigo, Wisconsin 54409

**RE: Supplemental Site Investigation
Fraser Shipyards Inc.
1 Clough Ave, Superior, WI 54880
Punch Shed Building Addition Spill
BRRTs 02-16-562899
ET Project # 14-1004**

Dear Mr. Hunt,

Environmental Troubleshooters Inc. (ET) submitted a Request for Technical Assistance for the subject site to the Wisconsin Department of Natural Resources (WDNR) on October 30, 2018. The WDNR responded to the request in a letter dated April 16, 2019. The WDNR response included two near-term action items under “Supplemental Site Investigation Work Plan Review”, including (1) completion of groundwater delineation of polynuclear aromatic hydrocarbons (PAHs) and (2) assessment of the vapor intrusion risk. This letter addresses those two specific items and requests approval to begin the closure process.

Groundwater Investigation

ET has conducted intermittent groundwater sampling at the release site since 2014 in accordance with NR716.09. Groundwater sampling conducted between 2014 and 2018 was performed using dedicated disposable bailers. Analytical results from this period indicated exceedances of WDNR Enforcement Standards (ESs) and Preventative Action Limits (PALs). Figure 1 depicts the site location. Figure 2 depicts the shipyard facility. Figure 3 depicts the Punch Shed Addition release area.

Per our discussion in early 2019 related to shallow groundwater sampling for PAHs, ET proposed resampling of the site wells using low flow methods to assess for false positive analytical results attributable to suspended PAHs vs. dissolved PAHs. ET resampled the wells on March 19 and August 21, 2019 using a low flow peristaltic pump with dedicated inert tubing. Analytical results for PAH analysis from these two sampling events were less than WDNR PALs. The analytical results relative to the WDNR PALs are summarized on the attached table. Copies of the laboratory reports from the two sampling events are attached.

Vapor Intrusion Investigation:

A vapor intrusion assessment was performed for the subject release on November 12, 2019 in accordance with Wis. Admin. Code NR716.11(5)(a). The assessment included 11 sample locations which are depicted on Figure 4. At each sample location, readings were collected with a photoionization detector (PID) with a 10.6 eV lamp. Readings were taken in ambient and sub-slab conduit areas where potential intrusion pathways were identified. A table is attached documenting the vapor screening locations and conditions associated with each location. The highest reading of 5 parts per million (ppm) was recorded in the ambient breathing space in the vicinity of the building's work benches. The bathroom yielded 1.9 ppm and the north garage area yielded 0.2 ppm. All other readings were 0.0 ppm. Based on these readings, vapor intrusion does not appear to be occurring in the spill area.

Discussions/Results:

Groundwater dissolved PAH concentrations are below PALs and contaminant soil vapors do not appear to be entering the building at concentrations posing a risk to human health. Based on these conditions, ET requests the WDNR affirm that no further investigation is warranted related to this release beyond submittal of the associated closure documents.

If you have any questions, please contact me at (218) 722-6013 or by email at jmccarthy@etsmn.com.

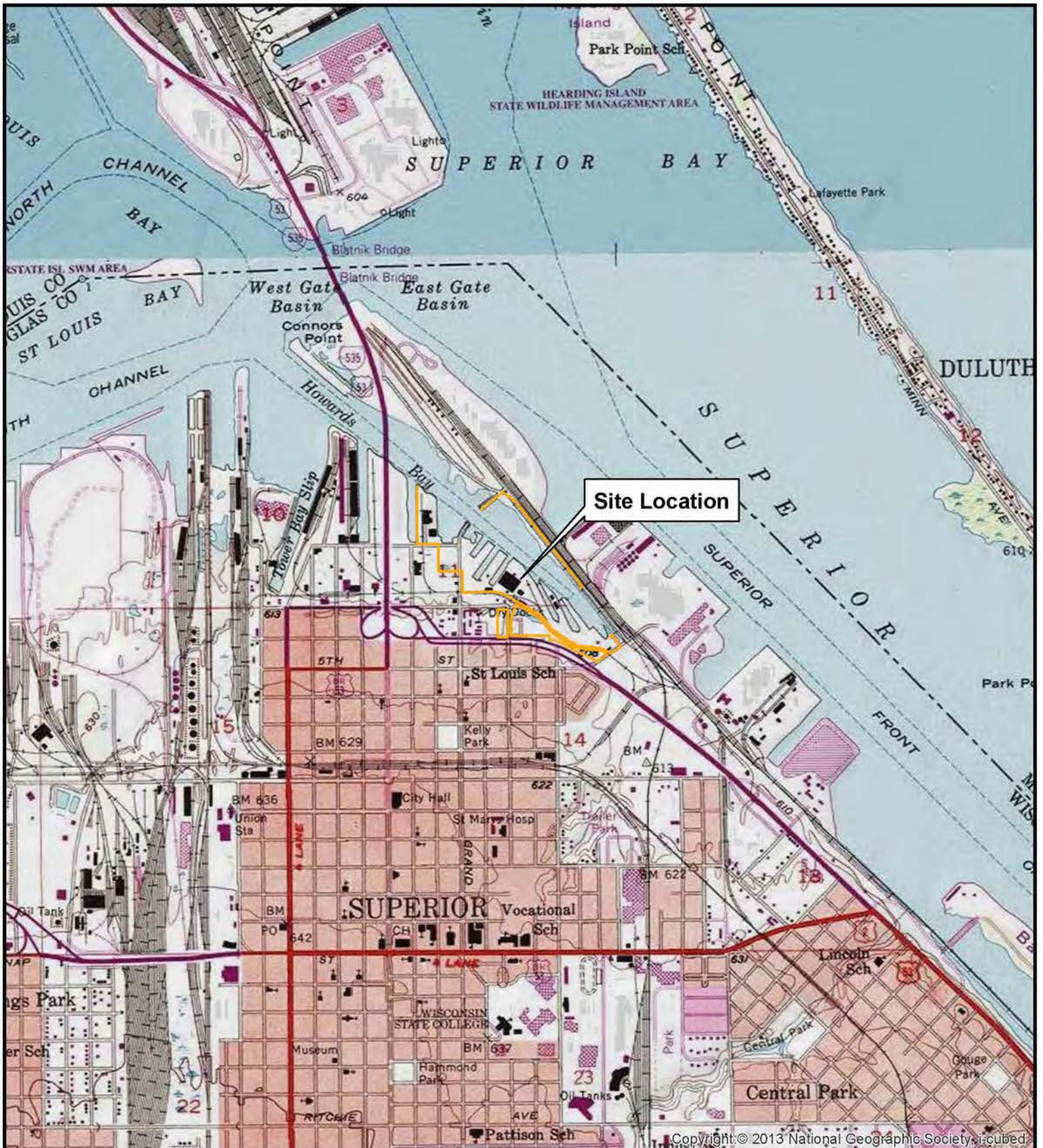
Sincerely,



John McCarthy, CHMM
Project Manager

Attachments:

- Figures 1 through 4
- Groundwater Analytical Summary Table
- Vapor Screening Summary Table
- Laboratory Analytical Reports



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Legend

— Approximate Property Line



SCALE: 1/24000

1 inch = 2,000 feet

Source: USGS Duluth & Superior 7 1/2" Quadrangle Map



FIGURE 1
Site Location

Fraser Shipyard
Superior, Wisconsin

PROJECT #: 14-1004

DATE: 02/28/2019 | **CREATED BY: CGIS**

FILE NAME: //GIS/2014 Projects/14-1004
/Projects/Figure1





Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend




-  Approximate Property Line
-  AOC
-  Railroads



FIGURE 2
Vicinity Map

**Fraser Shipyard
Superior, Wisconsin**

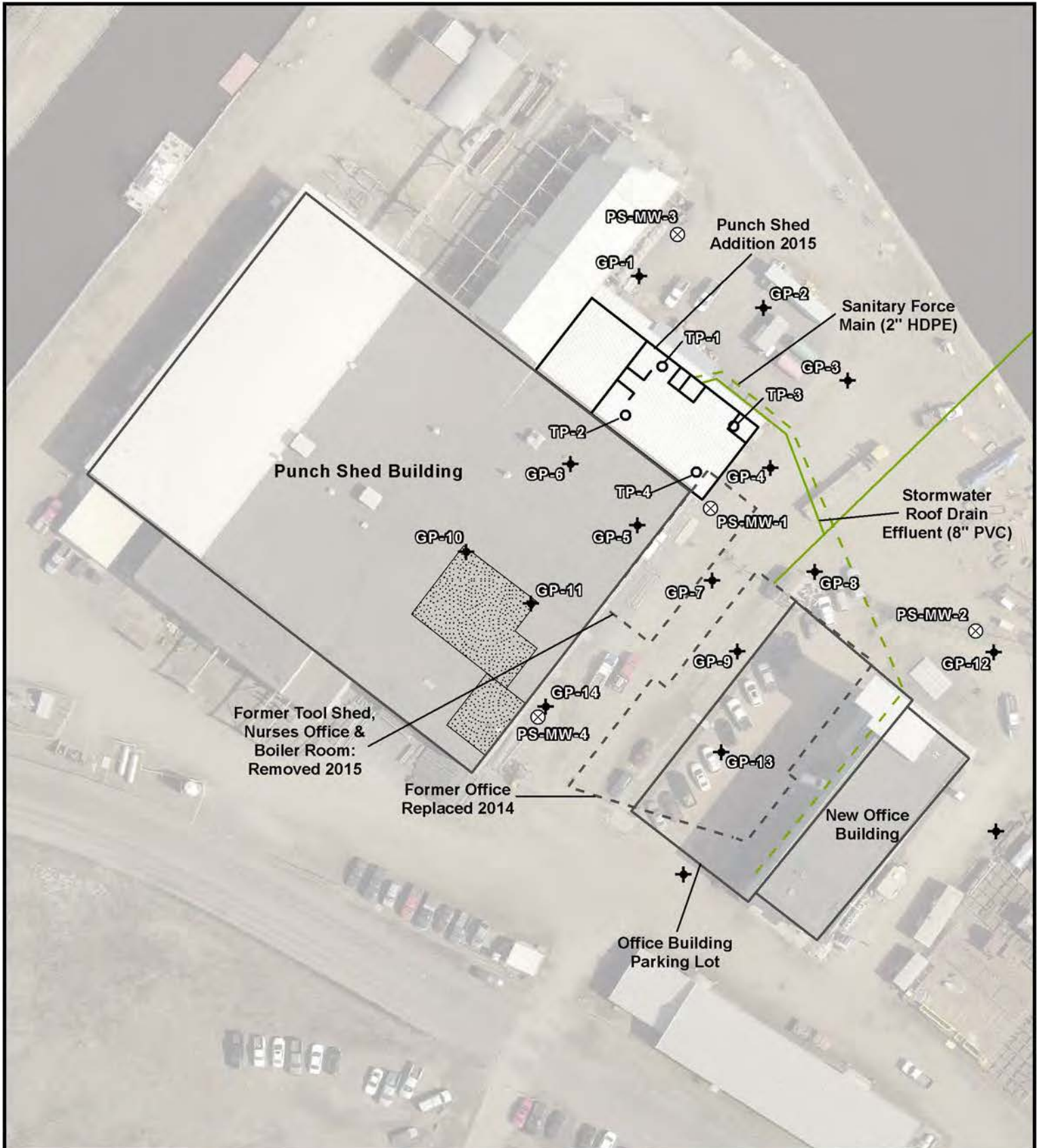
PROJECT #: 14-1004

DATE: 02/28/2019

CGIS

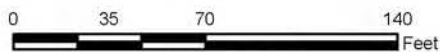
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/Projects/Figure2_r1





Legend

- ✦ Geoprobe Borings
- Excavation Test Pits
- ⊗ Groundwater Monitoring Wells
- - Former Building Footprint
- Building Footprint
- ▨ Gravel



SCALE: 1:840
1 inch = 70 feet

Source: Douglas County Aerial Imagery, circa Spring 2016



FIGURE 3
Site Plan

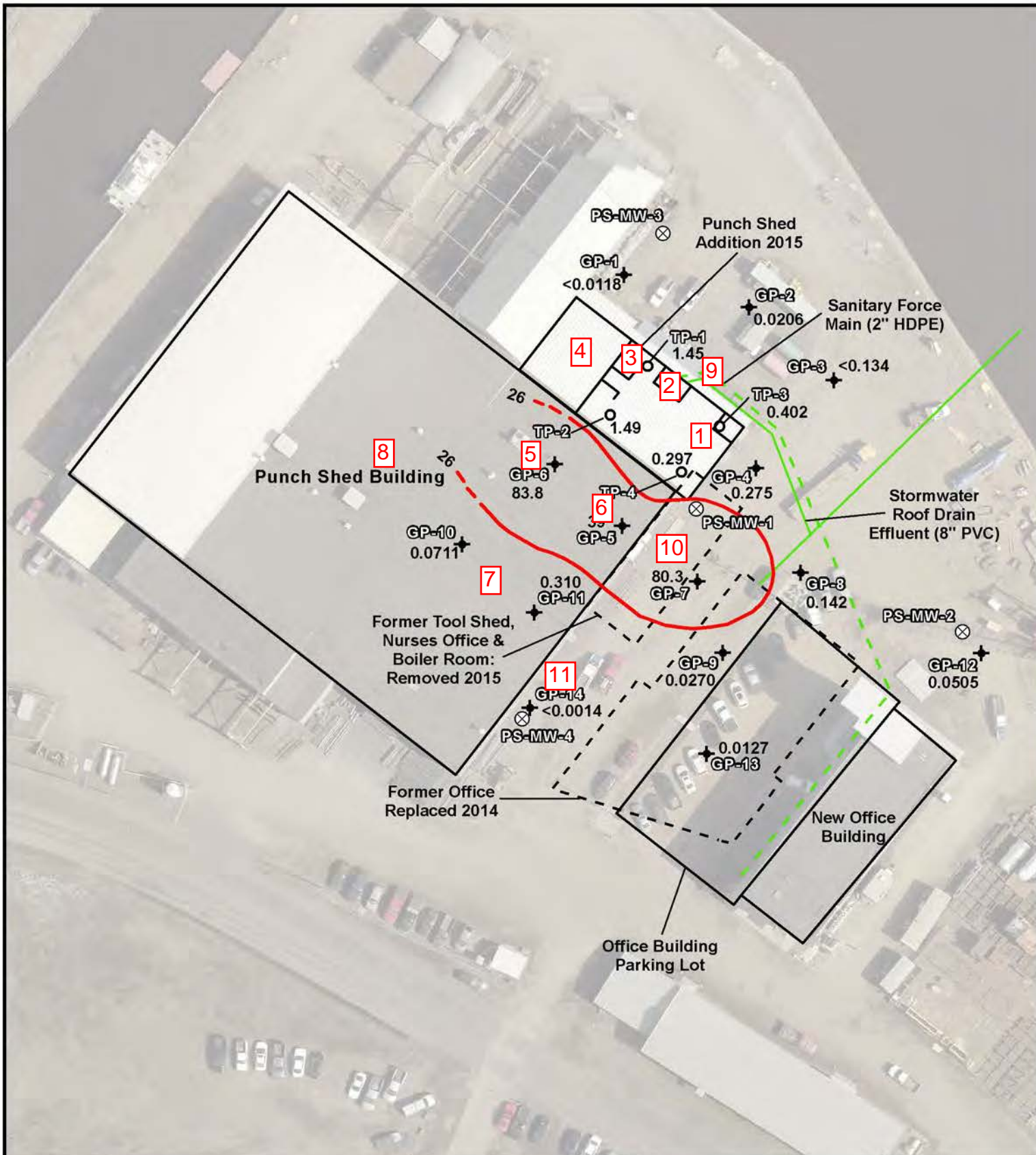
Fraser Shipyard
Superior, Wisconsin

PROJECT #: 14-1004

DATE: 02/28/2019 | CREATED BY: CGIS

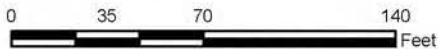
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/Projects/Figure3





Legend

- ✦ Geoprobe Borings
- Excavation Test Pits
- ⊗ Groundwater Monitoring Wells
- - Former Building Footprint
- Building Footprint
- 26 mg/Kg I-RCL



SCALE: 1:840
1 inch = 70 feet

Source: Douglas County Aerial Imagery, circa Spring 2016



Figure 4: Soil Vapor Intrusion Screening Locations

RJS Fraser Shipyard
Superior, Wisconsin

PROJECT #: 14-1004

DATE: 07/26/2016 CREATED BY: CGIS

FILE NAME: //GIS/2014 Projects/14-1004
/Projects/Figure3



Table 3: Groundwater Analytical Summary
Fraser Shipyards - Punch Shed Addition

All results in ug/L	Sample ID		GP-1	GP-2	GP-3	GP-4	GP-6	GP-7	GP-8	GP-81	GP-9
	Sample Date		3/25/2015	3/25/2015	3/25/2015	3/25/2015	3/25/2015	3/25/2015	6/29/2015	Dup	6/29/2015
VOCs	ES	PAL									
Acetone	9000	1800	<20.0	<20.0	<20.0	33.5	60.5	<20.0	--	--	--
Allyl Chloride	NP	NP	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	--	--	--
Benzene	5	0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
Bromobenzene	NP	NP	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
Bromochloromethane	NP	NP	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	--	--	--
Bromodichloromethane	0.6	0.06	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
Bromoform	4.4	0.44	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	--	--	--
Bromomethane	10	1	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	--	--	--
2-Butanone (MEK)	4000	800	<5.0	<5.0	<5.0	<5.0	14.5	<5.0	--	--	--
n-Butylbenzene	NP	NP	<1.0	<1.0	<1.0	<1.0	2.7	<1.0	--	--	--
sec-Butylbenzene	NP	NP	<1.0	<1.0	<1.0	<1.0	1.6	<1.0	--	--	--
tert-Butylbenzene	NP	NP	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
Carbon Tetrachloride	5	0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
Chlorobenzene	NP	NP	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
Chloroethane	400	80	<1.0	3.4	<1.0	<1.0	<1.0	<1.0	--	--	--
Chloroform	6	0.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
Chloromethane	30	3	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	--	--	--
2-Chlorotoluene	NP	NP	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
4-Chlorotoluene	NP	NP	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
1,2-Dibromo-3-chloropropane	0.2	0.02	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	--	--	--
Dibromochloromethane	60	6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
1,2-Dibromoethane (EDB)	0.05	0.005	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
Dibromomethane	NP	NP	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	--	--	--
1,2-Dichlorobenzene	600	60	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
1,3-Dichlorobenzene	600	120	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
1,4-Dichlorobenzene	75	15	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
Dichlorodifluoromethane	1000	200	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	--	--	--
1,1-Dichloroethane (DCA)	850	85	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
1,2-Dichloroethane	5	0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
1,1-Dichloroethene	7	0.7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
cis-1,2-Dichloroethene (DCE)	70	7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
trans-1,2-Dichloroethene	100	20	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--

29.5	Exceeds WDNR PAL & ES
0.081	Exceeds WDNR PAL, but not ES
<0.081	MDL exceeds WDNR PAL, but not ES
0.35	Detected above reporting limit
--	Not analyzed
NP	Not published

Table 3: Groundwater Analytical Summary
Fraser Shipyards - Punch Shed Addition

All results in ug/L	Sample ID		GP-1	GP-2	GP-3	GP-4	GP-6	GP-7	GP-8	GP-81	GP-9
	Sample Date		3/25/2015	3/25/2015	3/25/2015	3/25/2015	3/25/2015	3/25/2015	3/25/2015	6/29/2015	Dup
Dichlorofluoromethane	NP	NP	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
1,2-Dichloropropane	5	0.5	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	--	--	--
1,3-Dichloropropane	0.4	0.04	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
2,2-Dichloropropane	NP	NP	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	--	--	--
1,1-Dichloropropene	NP	NP	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
cis-1,3-Dichloropropene	NP	NP	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	--	--	--
trans-1,3-Dichloropropene	NP	NP	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	--	--	--
Diethyl Ether (Ethyl Ether)	1000	100	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	--	--	--
Ethylbenzene	700	140	<1.0	<1.0	<1.0	<1.0	4.6	<1.0	--	--	--
Hexachloro-1,3-butadiene	NP	NP	<1.0	1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
Isopropylbenzene (cumene)	NP	NP	<1.0	<1.0	<1.0	<1.0	2.1	<1.0	--	--	--
p-Isopropyltoluene	NP	NP	4.8	<1.0	<1.0	<1.0	12.1	<1.0	--	--	--
Methylene Chloride	5	0.5	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	--	--	--
4-Methyl-2-pentanone (MIBK)	500	50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	--	--	--
Methyl-tert-butyl-ether (MTBE)	60	12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
Naphthalene	100	10	<4.0	<4.0	<4.0	<4.0	228	<4.0	--	--	--
n-Propylbenzene	NP	NP	<1.0	<1.0	<1.0	<1.0	2.8	<1.0	--	--	--
Styrene	100	10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
1,1,1,2-Tetrachloroethane	70	7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
1,1,2,2-Tetrachloroethane	0.2	0.02	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
Tetrachloroethene (PCE)	5	0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
Tetrahydrofuran (THF)	50	10	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	--	--	--
Toluene	800	160	<1.0	<1.0	<1.0	<1.0	1.8	<1.0	--	--	--
1,2,3-Trichlorobenzene	NP	NP	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
1,2,4-Trichlorobenzene	70	14	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
1,1,1-Trichloroethane (TCA)	200	40	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
1,1,2-Trichloroethane (TCA)	5	0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
Trichloroethene (TCE)	5	0.5	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	--	--	--
Trichlorofluoromethane	NP	NP	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
1,2,3-Trichloropropane*	60	12	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	--	--	--
1,1,2-Trichlorofluoroethane	NP	NP	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--
1,2,4-Trimethylbenzene	480	96	<1.0	<1.0	<1.0	<1.0	96.4	<1.0	--	--	--
1,3,5-Trimethylbenzene			<1.0	<1.0	<1.0	<1.0	32.6	<1.0	--	--	--
Vinyl Chloride	0.2	0.02	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	--	--	--
Xylene (total)	2000	400	<3.0	<3.0	<3.0	<3.0	49.7	<3.0	--	--	--

Table 3: Groundwater Analytical Summary
Fraser Shipyards - Punch Shed Addition

All results in ug/L	Sample ID	GP-1	GP-2	GP-3	GP-4	GP-6	GP-7	GP-8	GP-81	GP-9	
	Sample Date	3/25/2015	3/25/2015	3/25/2015	3/25/2015	3/25/2015	3/25/2015	6/29/2015	Dup	6/29/2015	
PAHs											
Acenaphthene	NP	NP	1.2	0.19	0.15	<0.045	4.4	3.0	0.78	0.71	1.4
Acenaphthylene	NP	NP	0.17	<0.043	<0.042	<0.045	<0.21	<0.043	<0.043	0.092	<0.043
Anthracene	3000	600	0.18	<0.043	<0.042	<0.045	<0.21	1.1	0.079	0.073	0.17
Benzo(a)anthracene	NP	NP	0.43	<0.043	<0.042	<0.045	<0.21	0.15	<0.043	<0.042	<0.043
Benzo(a)pyrene	0.2	0.02	0.57	<0.043	<0.042	<0.045	<0.21	0.14	<0.043	<0.042	<0.043
Benzo(b)fluoranthene	0.2	0.02	0.84	<0.043	<0.042	<0.045	<0.21	0.16	<0.043	<0.042	<0.043
Benzo(g,h,i)perylene	NP	NP	0.52	<0.043	<0.042	<0.045	<0.21	<0.043	<0.043	<0.042	<0.043
Benzo(k)fluoranthene	NP	NP	0.27	<0.043	<0.042	<0.045	<0.21	0.068	<0.043	<0.042	<0.043
Chrysene	0.2	0.02	0.63	<0.043	<0.042	<0.045	<0.21	0.16	<0.043	<0.042	<0.043
Dibenzo(a,h)anthracene	NP	NP	<0.041	<0.043	<0.042	<0.045	<0.21	<0.043	<0.043	<0.042	<0.043
Fluoranthene	400	80	1.4	0.078	<0.042	<0.045	<0.21	0.9	0.087	0.086	0.17
Fluorene	400	80	0.35	0.17	<0.042	<0.045	2.3	1.6	0.56	0.51	0.46
Indeno(1,2,3-cd)pyrene	NP	NP	0.45	<0.043	<0.042	<0.045	<0.21	<0.043	<0.043	<0.042	<0.043
Naphthalene	100	10	<0.041	<0.043	<0.042	<0.045	231	2.1	0.056	0.064	0.29
Phenanthrene	NP	NP	0.89	0.11	0.083	<0.045	0.92	4.2	<0.043	<0.042	1.5
Pyrene	250	50	1.2	0.07	<0.042	<0.045	<0.21	0.7	0.063	0.068	0.14

29.5	Exceeds WDNR PAL & ES
0.081	Exceeds WDNR PAL, but not ES
<0.081	MDL exceeds WDNR PAL, but not ES
0.35	Detected above reporting limit
--	Not analyzed
NP	Not published

Table 3: Groundwater Analytical Summary
Fraser Shipyards - Punch Shed Addition

All results in ug/L	Sample ID		PS-MW-1					
	Sample Date		4/27/2016	7/19/2016	1/10/2017	8/23/2018	3/19/2019	8/21/2019
VOCs	ES	PAL						
Acetone	9000	1800	73.7	6.4J	--	--	--	--
Allyl Chloride	NP	NP	<4.0	<0.25	--	--	--	--
Benzene	5	0.5	<1.0	<0.16	--	--	--	--
Bromobenzene	NP	NP	<1.0	<0.34	--	--	--	--
Bromochloromethane	NP	NP	<4.0	<0.19	--	--	--	--
Bromodichloromethane	0.6	0.06	<1.0	<0.24	--	--	--	--
Bromoform	4.4	0.44	<4.0	<0.27	--	--	--	--
Bromomethane	10	1	<4.0	<0.44	--	--	--	--
2-Butanone (MEK)	4000	800	<5.0	<1.1	--	--	--	--
n-Butylbenzene	NP	NP	<1.0	<0.16	--	--	--	--
sec-Butylbenzene	NP	NP	<1.0	<0.19	--	--	--	--
tert-Butylbenzene	NP	NP	<1.0	<0.22	--	--	--	--
Carbon Tetrachloride	5	0.5	<1.0	<0.20	--	--	--	--
Chlorobenzene	NP	NP	<1.0	<0.11	--	--	--	--
Chloroethane	400	80	<1.0	<0.34	--	--	--	--
Chloroform	6	0.6	<1.0	<0.21	--	--	--	--
Chloromethane	30	3	<4.0	<0.25	--	--	--	--
2-Chlorotoluene	NP	NP	<1.0	<0.30	--	--	--	--
4-Chlorotoluene	NP	NP	<1.0	<0.26	--	--	--	--
1,2-Dibromo-3-chloropropane	0.2	0.02	<4.0	<0.60	--	--	--	--
Dibromochloromethane	60	6	<1.0	<0.16	--	--	--	--
1,2-Dibromoethane (EDB)	0.05	0.005	<1.0	<0.20	--	--	--	--
Dibromomethane	NP	NP	<4.0	<0.19	--	--	--	--
1,2-Dichlorobenzene	600	60	<1.0	<0.17	--	--	--	--
1,3-Dichlorobenzene	600	120	<1.0	<0.12	--	--	--	--
1,4-Dichlorobenzene	75	15	<1.0	<0.21	--	--	--	--
Dichlorodifluoromethane	1000	200	<4.0	<0.23	--	--	--	--
1,1-Dichloroethane (DCA)	850	85	<1.0	<0.17	--	--	--	--
1,2-Dichloroethane	5	0.5	<1.0	<0.17	--	--	--	--
1,1-Dichloroethene	7	0.7	<1.0	<0.28	--	--	--	--
cis-1,2-Dichloroethene (DCE)	70	7	<1.0	<0.12	--	--	--	--
trans-1,2-Dichloroethene	100	20	<1.0	<0.16	--	--	--	--

29.5	Exceeds WDNR PAL & ES
0.081	Exceeds WDNR PAL, but not ES
<0.081	MDL exceeds WDNR PAL, but not ES
0.35	Detected above reporting limit
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Table 3: Groundwater Analytical Summary
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All results in ug/L	Sample ID		PS-MW-1					
	Sample Date		4/27/2016	7/19/2016	1/10/2017	8/23/2018	3/19/2019	8/21/2019
Dichlorofluoromethane	NP	NP	<1.0	<0.21	--	--	--	--
1,2-Dichloropropane	5	0.5	<4.0	<0.22	--	--	--	--
1,3-Dichloropropane	0.4	0.04	<1.0	<0.096	--	--	--	--
2,2-Dichloropropane	NP	NP	<4.0	<0.13	--	--	--	--
1,1-Dichloropropene	NP	NP	<1.0	<0.23	--	--	--	--
cis-1,3-Dichloropropene	NP	NP	<4.0	<0.15	--	--	--	--
trans-1,3-Dichloropropene	NP	NP	<4.0	<0.15	--	--	--	--
Diethyl Ether (Ethyl Ether)	1000	100	<4.0	<0.19	--	--	--	--
Ethylbenzene	700	140	<1.0	0.24J	--	--	--	--
Hexachloro-1,3-butadiene	NP	NP	<1.0	<0.18	--	--	--	--
Isopropylbenzene (cumene)	NP	NP	<1.0	<0.25	--	--	--	--
p-Isopropyltoluene	NP	NP	6.6	0.93J	--	--	--	--
Methylene Chloride	5	0.5	<4.0	<0.29	--	--	--	--
4-Methyl-2-pentanone (MIBK)	500	50	8.4	0.69J	--	--	--	--
Methyl-tert-butyl-ether (MTBE)	60	12	<1.0	<0.15	--	--	--	--
Naphthalene	100	10	<4.0	0.21J	--	--	--	--
n-Propylbenzene	NP	NP	<1.0	<0.23	--	--	--	--
Styrene	100	10	<1.0	<0.29	--	--	--	--
1,1,1,2-Tetrachloroethane	70	7	<1.0	<0.17	--	--	--	--
1,1,2,2-Tetrachloroethane	0.2	0.02	<1.0	<0.22	--	--	--	--
Tetrachloroethene (PCE)	5	0.5	<1.0	<0.25	--	--	--	--
Tetrahydrofuran (THF)	50	10	<10.0	<1.5	--	--	--	--
Toluene	800	160	1.0	0.58J	--	--	--	--
1,2,3-Trichlorobenzene	NP	NP	<1.0	<0.21	--	--	--	--
1,2,4-Trichlorobenzene	70	14	<1.0	<0.21	--	--	--	--
1,1,1-Trichloroethane (TCA)	200	40	<1.0	<0.17	--	--	--	--
1,1,2-Trichloroethane (TCA)	5	0.5	<1.0	<0.15	--	--	--	--
Trichloroethene (TCE)	5	0.5	<0.40	<0.20	--	--	--	--
Trichlorofluoromethane	NP	NP	<1.0	<0.33	--	--	--	--
1,2,3-Trichloropropane*	60	12	<4.0	<0.28	--	--	--	--
1,1,2-Trichlorofluoroethane	NP	NP	<1.0	<0.32	--	--	--	--
1,2,4-Trimethylbenzene	480	96	3.1	0.55J	--	--	--	--
1,3,5-Trimethylbenzene			2.0	<0.27	--	--	--	--
Vinyl Chloride	0.2	0.02	<0.40	<0.29	--	--	--	--
Xylene (total)	2000	400	5.6	<0.32	--	--	--	--

Table 3: Groundwater Analytical Summary
Fraser Shipyards - Punch Shed Addition

All results in ug/L	Sample ID		PS-MW-1					
	Sample Date		4/27/2016	7/19/2016	1/10/2017	8/23/2018	3/19/2019	8/21/2019
PAHs								
Acenaphthene	NP	NP	<0.051	0.069	0.210	<0.0033	0.230	0.120
Acenaphthylene	NP	NP	<0.051	0.011J	0.042	<0.0048	<0.0049	<0.011
Anthracene	3000	600	<0.051	0.0066J	0.13	<0.0064	<0.0065	<0.011
Benzo(a)anthracene	NP	NP	<0.051	0.011	0.015	<0.0040	<0.0041	<0.0090
Benzo(a)pyrene	0.2	0.02	<0.051	<0.0056	0.0091J	<0.0041	<0.0042	<0.0063
Benzo(b)fluoranthene	0.2	0.02	<0.051	0.0083J	0.017	<0.013	<0.013	<0.0099
Benzo(g,h,i)perylene	NP	NP	<0.051	0.0063J	0.011J	<0.010	<0.010	<0.011
Benzo(k)fluoranthene	NP	NP	<0.051	<0.0043	0.0078J	<0.011	<0.011	<0.0074
Chrysene	0.2	0.02	<0.051	0.0068J	0.018	<0.0095	<0.0097	<0.012
Dibenzo(a,h)anthracene	NP	NP	<0.051	<0.0040	0.0071J	<0.0095	<0.0097	<0.0096
Fluoranthene	400	80	0.058	0.016J	0.045	<0.019	<0.019	<0.011
Fluorene	400	80	<0.051	0.0094J	0.075	<0.0061	<0.0063	0.035
Indeno(1,2,3-cd)pyrene	NP	NP	<0.051	<0.0042	0.010J	<0.014	<0.014	<0.0061
Naphthalene	100	10	0.061	0.013J	0.440	0.0430	0.053	0.059
Phenanthrene	NP	NP	0.071	0.019J	0.066	<0.011	0.020	0.027
Pyrene	250	50	<0.051	0.027	0.031	<0.015	<0.015	.0084J

29.5	Exceeds WDNR PAL & ES
0.081	Exceeds WDNR PAL, but not ES
<0.081	MDL exceeds WDNR PAL, but not ES
0.35	Detected above reporting limit
--	Not analyzed
NP	Not published

All results in ug/L	Sample ID		PS-MW-2						
	Sample Date		4/27/2016	4/27/2016	7/19/2016	1/10/2017	8/23/2018	3/19/2019	8/21/2019
VOCs	ES	PAL		MW-2 Dup					
Acetone	9000	1800	93.9	88.5	2.7J	--	--	--	--
Allyl Chloride	NP	NP	<4.0	<4.0	<0.25	--	--	--	--
Benzene	5	0.5	<1.0	<1.0	<0.16	--	--	--	--
Bromobenzene	NP	NP	<1.0	<1.0	<0.34	--	--	--	--
Bromochloromethane	NP	NP	<4.0	<4.0	<0.19	--	--	--	--
Bromodichloromethane	0.6	0.06	<1.0	<1.0	<0.24	--	--	--	--
Bromoform	4.4	0.44	<4.0	<4.0	<0.27	--	--	--	--
Bromomethane	10	1	<4.0	<4.0	<0.44	--	--	--	--
2-Butanone (MEK)	4000	800	<5.0	<5.0	<1.1	--	--	--	--
n-Butylbenzene	NP	NP	<1.0	<1.0	<0.16	--	--	--	--
sec-Butylbenzene	NP	NP	<1.0	<1.0	<0.19	--	--	--	--
tert-Butylbenzene	NP	NP	<1.0	<1.0	<0.22	--	--	--	--
Carbon Tetrachloride	5	0.5	<1.0	<1.0	<0.20	--	--	--	--
Chlorobenzene	NP	NP	<1.0	<1.0	<0.11	--	--	--	--
Chloroethane	400	80	<1.0	<1.0	<0.34	--	--	--	--
Chloroform	6	0.6	<1.0	<1.0	<0.21	--	--	--	--
Chloromethane	30	3	<4.0	<4.0	<0.25	--	--	--	--
2-Chlorotoluene	NP	NP	<1.0	<1.0	<0.30	--	--	--	--
4-Chlorotoluene	NP	NP	<1.0	<1.0	<0.26	--	--	--	--
1,2-Dibromo-3-chloropropane	0.2	0.02	<4.0	<4.0	<0.60	--	--	--	--
Dibromochloromethane	60	6	<1.0	<1.0	<0.16	--	--	--	--
1,2-Dibromoethane (EDB)	0.05	0.005	<1.0	<1.0	<0.20	--	--	--	--
Dibromomethane	NP	NP	<4.0	<4.0	<0.19	--	--	--	--
1,2-Dichlorobenzene	600	60	<1.0	<1.0	<0.17	--	--	--	--
1,3-Dichlorobenzene	600	120	<1.0	<1.0	<0.12	--	--	--	--
1,4-Dichlorobenzene	75	15	<1.0	<1.0	<0.21	--	--	--	--
Dichlorodifluoromethane	1000	200	<4.0	<4.0	<0.23	--	--	--	--
1,1-Dichloroethane (DCA)	850	85	<1.0	<1.0	<0.17	--	--	--	--
1,2-Dichloroethane	5	0.5	<1.0	<1.0	<0.17	--	--	--	--
1,1-Dichloroethene	7	0.7	<1.0	<1.0	<0.28	--	--	--	--
cis-1,2-Dichloroethene (DCE)	70	7	<1.0	<1.0	<0.12	--	--	--	--
trans-1,2-Dichloroethene	100	20	<1.0	<1.0	<0.16	--	--	--	--

All results in ug/L	Sample ID		PS-MW-2						
	Sample Date		4/27/2016	4/27/2016	7/19/2016	1/10/2017	8/23/2018	3/19/2019	8/21/2019
Dichlorofluoromethane	NP	NP	<1.0	<1.0	<0.21	--	--	--	--
1,2-Dichloropropane	5	0.5	<4.0	<4.0	<0.22	--	--	--	--
1,3-Dichloropropane	0.4	0.04	<1.0	<1.0	<0.096	--	--	--	--
2,2-Dichloropropane	NP	NP	<4.0	<4.0	<0.13	--	--	--	--
1,1-Dichloropropene	NP	NP	<1.0	<1.0	<0.23	--	--	--	--
cis-1,3-Dichloropropene	NP	NP	<4.0	<4.0	<0.15	--	--	--	--
trans-1,3-Dichloropropene	NP	NP	<4.0	<4.0	<0.15	--	--	--	--
Diethyl Ether (Ethyl Ether)	1000	100	<4.0	<4.0	<0.19	--	--	--	--
Ethylbenzene	700	140	<1.0	<1.0	0.24J	--	--	--	--
Hexachloro-1,3-butadiene	NP	NP	<1.0	<1.0	<0.18	--	--	--	--
Isopropylbenzene (cumene)	NP	NP	<1.0	<1.0	<0.25	--	--	--	--
p-Isopropyltoluene	NP	NP	2.8	2.9	<0.19	--	--	--	--
Methylene Chloride	5	0.5	<4.0	<4.0	<0.29	--	--	--	--
4-Methyl-2-pentanone (MIBK)	500	50	<5.0	<5.0	<0.43	--	--	--	--
Methyl-tert-butyl-ether (MTBE)	60	12	<1.0	<1.0	<0.15	--	--	--	--
Naphthalene	100	10	<4.0	<4.0	<0.20	--	--	--	--
n-Propylbenzene	NP	NP	<1.0	<1.0	<0.23	--	--	--	--
Styrene	100	10	<1.0	<1.0	<0.29	--	--	--	--
1,1,1,2-Tetrachloroethane	70	7	<1.0	<1.0	<0.17	--	--	--	--
1,1,2,2-Tetrachloroethane	0.2	0.02	<1.0	<1.0	<0.22	--	--	--	--
Tetrachloroethene (PCE)	5	0.5	<1.0	<1.0	<0.25	--	--	--	--
Tetrahydrofuran (THF)	50	10	<10.0	<10.0	<1.5	--	--	--	--
Toluene	800	160	1.4	1.2	<0.14	--	--	--	--
1,2,3-Trichlorobenzene	NP	NP	<1.0	<1.0	<0.21	--	--	--	--
1,2,4-Trichlorobenzene	70	14	<1.0	<1.0	<0.21	--	--	--	--
1,1,1-Trichloroethane (TCA)	200	40	<1.0	<1.0	<0.17	--	--	--	--
1,1,2-Trichloroethane (TCA)	5	0.5	<1.0	<1.0	<0.15	--	--	--	--
Trichloroethene (TCE)	5	0.5	<0.40	<0.40	<0.20	--	--	--	--
Trichlorofluoromethane	NP	NP	<1.0	<1.0	<0.33	--	--	--	--
1,2,3-Trichloropropane*	60	12	<4.0	<4.0	<0.28	--	--	--	--
1,1,2-Trichlorofluoroethane	NP	NP	<1.0	<1.0	<0.32	--	--	--	--
1,2,4-Trimethylbenzene	480	96	2.1	2.2	0.35J	--	--	--	--
1,3,5-Trimethylbenzene			<1.0	<1.0	<0.27	--	--	--	--
Vinyl Chloride	0.2	0.02	<0.40	<0.40	<0.29	--	--	--	--
Xylene (total)	2000	400	4.2	3.9	<0.32	--	--	--	--

All results in ug/L	Sample ID		PS-MW-2						
	Sample Date		4/27/2016	4/27/2016	7/19/2016	1/10/2017	8/23/2018	3/19/2019	8/21/2019
PAHs									
Acenaphthene	NP	NP	<0.043	<0.044	0.0017J	<0.0064	<0.0032	<0.0033	<0.013
Acenaphthylene	NP	NP	<0.043	<0.044	<0.0075	<0.013	<0.0046	<0.0048	<0.010
Anthracene	3000	600	<0.043	<0.044	0.011J	0.010J	<0.0062	<0.0064	0.011J
Benzo(a)anthracene	NP	NP	<0.043	<0.044	0.031	0.028	<0.0039	<0.0041	<0.0086
Benzo(a)pyrene	0.2	0.02	<0.043	<0.044	0.027	0.021J	<0.004	<0.0042	<0.0061
Benzo(b)fluoranthene	0.2	0.02	<0.043	<0.044	0.038	0.028	<0.013	<0.013	<0.0095
Benzo(g,h,i)perylene	NP	NP	<0.043	<0.044	0.022	0.02J	<0.0098	<0.010	<0.010
Benzo(k)fluoranthene	NP	NP	<0.043	<0.044	0.017	0.014J	<0.010	<0.011	<0.0071
Chrysene	0.2	0.02	<0.043	<0.044	0.029	0.022J	<0.0092	<0.0096	<0.011
Dibenzo(a,h)anthracene	NP	NP	<0.043	<0.044	0.0051J	0.011J	<0.0092	<0.0096	<0.0092
Fluoranthene	400	80	<0.043	<0.044	0.066	0.047	<0.0018	<0.019	<0.011
Fluorene	400	80	0.063	0.064	0.019J	0.011J	<0.0059	<0.0062	<0.0058
Indeno(1,2,3-cd)pyrene	NP	NP	<0.043	<0.044	0.017J	0.018J	<0.013	<0.014	<0.0058
Naphthalene	100	10	0.11	0.093	0.077	0.022J	<0.0068	<0.0071	0.025J
Phenanthrene	NP	NP	0.15	0.14	0.096	0.042	<0.010	<0.011	0.021J
Pyrene	250	50	<0.043	<0.044	0.059	0.037	<0.015	<0.015	<0.0070

Table 3: Groundwater Analytical Summary
Fraser Shipyards - Punch Shed Addition

All results in ug/L	Sample ID		PS-MW-3									
	Sample Date		4/27/2016	7/19/2016	7/19/2016	1/10/2017	1/10/2017	8/23/2018	8/23/2018	3/19/2019	3/19/2019	8/21/2019
VOCs	ES	PAL			Dup		Dup		Dup		Dup	
Acetone	9000	1800	<20.0	5.9J	4.1J	--	--	--	--	--	--	--
Allyl Chloride	NP	NP	<4.0	<0.25	<0.25	--	--	--	--	--	--	--
Benzene	5	0.5	<1.0	<0.16	<0.16	--	--	--	--	--	--	--
Bromobenzene	NP	NP	<1.0	<0.34	<0.34	--	--	--	--	--	--	--
Bromochloromethane	NP	NP	<4.0	<0.19	<0.19	--	--	--	--	--	--	--
Bromodichloromethane	0.6	0.06	<1.0	<0.24	<0.24	--	--	--	--	--	--	--
Bromoform	4.4	0.44	<4.0	<0.27	<0.27	--	--	--	--	--	--	--
Bromomethane	10	1	<4.0	<0.44	<0.44	--	--	--	--	--	--	--
2-Butanone (MEK)	4000	800	<5.0	<1.1	<1.1	--	--	--	--	--	--	--
n-Butylbenzene	NP	NP	<1.0	<0.16	<0.16	--	--	--	--	--	--	--
sec-Butylbenzene	NP	NP	<1.0	<0.19	<0.19	--	--	--	--	--	--	--
tert-Butylbenzene	NP	NP	<1.0	<0.22	<0.22	--	--	--	--	--	--	--
Carbon Tetrachloride	5	0.5	<1.0	<0.20	<0.20	--	--	--	--	--	--	--
Chlorobenzene	NP	NP	<1.0	<0.11	<0.11	--	--	--	--	--	--	--
Chloroethane	400	80	<1.0	<0.34	<0.34	--	--	--	--	--	--	--
Chloroform	6	0.6	<1.0	<0.21	<0.21	--	--	--	--	--	--	--
Chloromethane	30	3	<4.0	<0.25	<0.25	--	--	--	--	--	--	--
2-Chlorotoluene	NP	NP	<1.0	<0.30	<0.30	--	--	--	--	--	--	--
4-Chlorotoluene	NP	NP	<1.0	<0.26	<0.26	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane	0.2	0.02	<4.0	<0.60	<0.60	--	--	--	--	--	--	--
Dibromochloromethane	60	6	<1.0	<0.16	<0.16	--	--	--	--	--	--	--
1,2-Dibromoethane (EDB)	0.05	0.005	<1.0	<0.20	<0.20	--	--	--	--	--	--	--
Dibromomethane	NP	NP	<4.0	<0.19	<0.19	--	--	--	--	--	--	--
1,2-Dichlorobenzene	600	60	<1.0	<0.17	<0.17	--	--	--	--	--	--	--
1,3-Dichlorobenzene	600	120	<1.0	<0.12	<0.12	--	--	--	--	--	--	--
1,4-Dichlorobenzene	75	15	<1.0	<0.21	<0.21	--	--	--	--	--	--	--
Dichlorodifluoromethane	1000	200	<4.0	<0.23	<0.23	--	--	--	--	--	--	--
1,1-Dichloroethane (DCA)	850	85	<1.0	0.76J	0.93J	--	--	--	--	--	--	--
1,2-Dichloroethane	5	0.5	<1.0	<0.17	<0.17	--	--	--	--	--	--	--
1,1-Dichloroethene	7	0.7	<1.0	<0.28	<0.28	--	--	--	--	--	--	--
cis-1,2-Dichloroethene (DCE)	70	7	<1.0	<0.12	<0.12	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	100	20	<1.0	<0.16	<0.16	--	--	--	--	--	--	--

29.5	Exceeds WDNR PAL & ES
0.081	Exceeds WDNR PAL, but not ES
<0.081	MDL exceeds WDNR PAL, but not ES
0.35	Detected above reporting limit
--	Not analyzed
NP	Not published

Table 3: Groundwater Analytical Summary
Fraser Shipyards - Punch Shed Addition

All results in ug/L	Sample ID		PS-MW-3									
	Sample Date		4/27/2016	7/19/2016	7/19/2016	1/10/2017	1/10/2017	8/23/2018	8/23/2018	3/19/2019	3/19/2019	8/21/2019
Dichlorofluoromethane	NP	NP	<1.0	<0.21	<0.21	--	--	--	--	--	--	--
1,2-Dichloropropane	5	0.5	<4.0	<0.22	<0.22	--	--	--	--	--	--	--
1,3-Dichloropropane	0.4	0.04	<1.0	<0.096	<0.096	--	--	--	--	--	--	--
2,2-Dichloropropane	NP	NP	<4.0	<0.13	<0.13	--	--	--	--	--	--	--
1,1-Dichloropropene	NP	NP	<1.0	<0.23	<0.23	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	NP	NP	<4.0	<0.15	<0.15	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	NP	NP	<4.0	<0.15	<0.15	--	--	--	--	--	--	--
Diethyl Ether (Ethyl Ether)	1000	100	<4.0	<0.19	<0.19	--	--	--	--	--	--	--
Ethylbenzene	700	140	<1.0	<0.15	<0.15	--	--	--	--	--	--	--
Hexachloro-1,3-butadiene	NP	NP	<1.0	<0.18	<0.18	--	--	--	--	--	--	--
Isopropylbenzene (cumene)	NP	NP	<1.0	<0.25	<0.25	--	--	--	--	--	--	--
p-Isopropyltoluene	NP	NP	<1.0	<0.19	<0.19	--	--	--	--	--	--	--
Methylene Chloride	5	0.5	<4.0	<0.29	<0.29	--	--	--	--	--	--	--
4-Methyl-2-pentanone (MIBK)	500	50	<5.0	<0.43	<0.43	--	--	--	--	--	--	--
Methyl-tert-butyl-ether (MTBE)	60	12	<1.0	<0.15	<0.15	--	--	--	--	--	--	--
Naphthalene	100	10	<4.0	1.9J	1.2J	--	--	--	--	--	--	--
n-Propylbenzene	NP	NP	<1.0	<0.23	<0.23	--	--	--	--	--	--	--
Styrene	100	10	<1.0	<0.29	<0.29	--	--	--	--	--	--	--
1,1,1,2-Tetrachloroethane	70	7	<1.0	<0.17	<0.17	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	0.2	0.02	<1.0	<0.22	<0.22	--	--	--	--	--	--	--
Tetrachloroethene (PCE)	5	0.5	<1.0	<0.25	<0.25	--	--	--	--	--	--	--
Tetrahydrofuran (THF)	50	10	24.2	<1.5	4.3J	--	--	--	--	--	--	--
Toluene	800	160	<1.0	<0.14	<0.14	--	--	--	--	--	--	--
1,2,3-Trichlorobenzene	NP	NP	<1.0	<0.21	<0.21	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	70	14	<1.0	<0.21	<0.21	--	--	--	--	--	--	--
1,1,1-Trichloroethane (TCA)	200	40	<1.0	<0.17	<0.17	--	--	--	--	--	--	--
1,1,2-Trichloroethane (TCA)	5	0.5	<1.0	<0.15	<0.15	--	--	--	--	--	--	--
Trichloroethene (TCE)	5	0.5	<0.40	<0.20	<0.20	--	--	--	--	--	--	--
Trichlorofluoromethane	NP	NP	<1.0	<0.33	<0.33	--	--	--	--	--	--	--
1,2,3-Trichloropropane*	60	12	<4.0	<0.28	<0.28	--	--	--	--	--	--	--
1,1,2-Trichlorofluoroethane	NP	NP	<1.0	<0.32	<0.32	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	480	96	<1.0	0.38J	0.21J	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene			<1.0	<0.27	<0.27	--	--	--	--	--	--	--
Vinyl Chloride	0.2	0.02	<0.40	<0.29	<0.29	--	--	--	--	--	--	--
Xylene (total)	2000	400	<3.0	<0.32	<0.32	--	--	--	--	--	--	--

Table 3: Groundwater Analytical Summary
Fraser Shipyards - Punch Shed Addition

All results in ug/L	Sample ID		PS-MW-3									
	Sample Date		4/27/2016	7/19/2016	7/19/2016	1/10/2017	1/10/2017	8/23/2018	8/23/2018	3/19/2019	3/19/2019	8/21/2019
PAHs												
Acenaphthene	NP	NP	0.51	1.3	1.1	1.6	1.4	2.1	2.400	1.100	0.980	1.600
Acenaphthylene	NP	NP	0.10	0.078	0.051	0.033	0.014J	0.160	0.180	<0.0049	<0.0048	0.011J
Anthracene	3000	600	0.44	0.28	0.24	0.15	0.11	0.47	0.610	0.079	0.120	0.084
Benzo(a)anthracene	NP	NP	0.54	0.28	0.21	0.094	0.021	0.620	0.840	<0.0041	<0.0040	<0.0086
Benzo(a)pyrene	0.2	0.02	0.59	0.31	0.24	0.12	0.020	0.69	0.950	<0.0042	<0.0041	<0.0061
Benzo(b)fluoranthene	0.2	0.02	0.69	0.37	0.29	0.13	0.022	0.90	1.100	<0.013	<0.013	<0.0095
Benzo(g,h,i)perylene	NP	NP	0.36	0.19	0.15	0.079	0.013	0.460	0.590	<0.010	<0.010	<0.010
Benzo(k)fluoranthene	NP	NP	0.25	0.14	0.11	0.055	0.0077J	0.320	0.530	<0.011	<0.011	<0.0071
Chrysene	0.2	0.02	0.55	0.31	0.24	0.12	0.020	0.62	0.830	<0.0097	<0.0095	<0.011
Dibenzo(a,h)anthracene	NP	NP	0.083	0.040	0.032J	0.018	<0.0039	0.082	0.100	<0.0097	<0.0095	<0.0092
Fluoranthene	400	80	1.50	0.83	0.69	0.38	0.13	1.90	2.500	0.052	0.054	0.070
Fluorene	400	80	0.31	0.46	0.41	0.48	0.43	0.91	1.100	0.450	0.440	0.700
Indeno(1,2,3-cd)pyrene	NP	NP	0.30	0.16	0.13	0.063	0.010J	0.370	0.480	<0.014	<0.014	<0.0058
Naphthalene	100	10	0.41	0.97	0.79	0.61	0.50	0.65	0.740	0.370	0.340	0.540
Phenanthrene	NP	NP	2.1	1.7	1.4	1.2	0.93	3.0	3.700	0.560	0.560	0.980
Pyrene	250	50	1.40	0.82	0.65	0.31	0.091	1.90	2.600	0.030	0.036	0.048

29.5	Exceeds WDNR PAL & ES
0.081	Exceeds WDNR PAL, but not ES
<0.081	MDL exceeds WDNR PAL, but not ES
0.35	Detected above reporting limit
--	Not analyzed
NP	Not published

Table 3: Groundwater Analytical Summary
Fraser Shipyards - Punch Shed Addition

All results in ug/L	Sample ID		PS-MW-4							HCL Trip
	Sample Date		4/27/2016	7/19/2016	1/10/2017	8/23/2018	3/19/2019	8/21/2019	8/21/2019	7/19/2016
VOCs	ES	PAL							Dup	
Acetone	9000	1800	<20.0	5.4J	--	--	--	--	--	6.8J
Allyl Chloride	NP	NP	<4.0	<0.25	--	--	--	--	--	<0.25
Benzene	5	0.5	<1.0	<0.16	--	--	--	--	--	<0.16
Bromobenzene	NP	NP	<1.0	<0.34	--	--	--	--	--	<0.34
Bromochloromethane	NP	NP	<4.0	<0.19	--	--	--	--	--	<0.19
Bromodichloromethane	0.6	0.06	<1.0	<0.24	--	--	--	--	--	<0.24
Bromoform	4.4	0.44	<4.0	<0.27	--	--	--	--	--	<0.27
Bromomethane	10	1	<4.0	<0.44	--	--	--	--	--	<0.44
2-Butanone (MEK)	4000	800	<5.0	<1.1	--	--	--	--	--	<1.1
n-Butylbenzene	NP	NP	<1.0	<0.16	--	--	--	--	--	<0.16
sec-Butylbenzene	NP	NP	<1.0	<0.19	--	--	--	--	--	<0.19
tert-Butylbenzene	NP	NP	<1.0	<0.22	--	--	--	--	--	<0.22
Carbon Tetrachloride	5	0.5	<1.0	<0.20	--	--	--	--	--	<0.20
Chlorobenzene	NP	NP	<1.0	<0.11	--	--	--	--	--	<0.11
Chloroethane	400	80	<1.0	<0.34	--	--	--	--	--	<0.34
Chloroform	6	0.6	<1.0	<0.21	--	--	--	--	--	<0.21
Chloromethane	30	3	<4.0	<0.25	--	--	--	--	--	<0.25
2-Chlorotoluene	NP	NP	<1.0	<0.30	--	--	--	--	--	<0.30
4-Chlorotoluene	NP	NP	<1.0	<0.26	--	--	--	--	--	<0.26
1,2-Dibromo-3-chloropropane	0.2	0.02	<4.0	<0.60	--	--	--	--	--	<0.60
Dibromochloromethane	60	6	<1.0	<0.16	--	--	--	--	--	<0.16
1,2-Dibromoethane (EDB)	0.05	0.005	<1.0	<0.20	--	--	--	--	--	<0.20
Dibromomethane	NP	NP	<4.0	<0.19	--	--	--	--	--	<0.19
1,2-Dichlorobenzene	600	60	<1.0	<0.17	--	--	--	--	--	<0.17
1,3-Dichlorobenzene	600	120	<1.0	<0.12	--	--	--	--	--	<0.12
1,4-Dichlorobenzene	75	15	<1.0	<0.21	--	--	--	--	--	<0.21
Dichlorodifluoromethane	1000	200	<4.0	<0.23	--	--	--	--	--	<0.23
1,1-Dichloroethane (DCA)	850	85	<1.0	<0.17	--	--	--	--	--	<0.17
1,2-Dichloroethane	5	0.5	<1.0	<0.17	--	--	--	--	--	<0.17
1,1-Dichloroethene	7	0.7	<1.0	<0.28	--	--	--	--	--	<0.28
cis-1,2-Dichloroethene (DCE)	70	7	<1.0	<0.12	--	--	--	--	--	<0.12
trans-1,2-Dichloroethene	100	20	<1.0	<0.16	--	--	--	--	--	<0.16

29.5	Exceeds WDNR PAL & ES
0.081	Exceeds WDNR PAL, but not ES
<0.081	MDL exceeds WDNR PAL, but not ES
0.35	Detected above reporting limit
--	Not analyzed
NP	Not published

Table 3: Groundwater Analytical Summary
Fraser Shipyards - Punch Shed Addition

All results in ug/L	Sample ID		PS-MW-4							HCL Trip
	Sample Date		4/27/2016	7/19/2016	1/10/2017	8/23/2018	3/19/2019	8/21/2019	8/21/2019	7/19/2016
Dichlorofluoromethane	NP	NP	<1.0	<0.21	--	--	--	--	--	<0.21
1,2-Dichloropropane	5	0.5	<4.0	<0.22	--	--	--	--	--	<0.22
1,3-Dichloropropane	0.4	0.04	<1.0	<0.096	--	--	--	--	--	<0.096
2,2-Dichloropropane	NP	NP	<4.0	<0.13	--	--	--	--	--	<0.13
1,1-Dichloropropene	NP	NP	<1.0	<0.23	--	--	--	--	--	<0.23
cis-1,3-Dichloropropene	NP	NP	<4.0	<0.15	--	--	--	--	--	<0.15
trans-1,3-Dichloropropene	NP	NP	<4.0	<0.15	--	--	--	--	--	<0.15
Diethyl Ether (Ethyl Ether)	1000	100	<4.0	<0.19	--	--	--	--	--	<0.19
Ethylbenzene	700	140	<1.0	<0.15	--	--	--	--	--	<0.15
Hexachloro-1,3-butadiene	NP	NP	<1.0	<0.18	--	--	--	--	--	<0.18
Isopropylbenzene (cumene)	NP	NP	<1.0	<0.25	--	--	--	--	--	<0.25
p-Isopropyltoluene	NP	NP	1.9	0.48J	--	--	--	--	--	<0.19
Methylene Chloride	5	0.5	<4.0	<0.29	--	--	--	--	--	0.37J
4-Methyl-2-pentanone (MIBK)	500	50	<5.0	<0.43	--	--	--	--	--	<0.43
Methyl-tert-butyl-ether (MTBE)	60	12	<1.0	<0.15	--	--	--	--	--	<0.15
Naphthalene	100	10	<4.0	<0.20	--	--	--	--	--	<0.20
n-Propylbenzene	NP	NP	<1.0	<0.23	--	--	--	--	--	<0.23
Styrene	100	10	<1.0	<0.29	--	--	--	--	--	<0.29
1,1,1,2-Tetrachloroethane	70	7	<1.0	<0.17	--	--	--	--	--	<0.17
1,1,2,2-Tetrachloroethane	0.2	0.02	<1.0	<0.22	--	--	--	--	--	<0.22
Tetrachloroethene (PCE)	5	0.5	<1.0	<0.25	--	--	--	--	--	<0.25
Tetrahydrofuran (THF)	50	10	<10.0	<1.5	--	--	--	--	--	<1.5
Toluene	800	160	<1.0	<0.14	--	--	--	--	--	<0.14
1,2,3-Trichlorobenzene	NP	NP	<1.0	<0.21	--	--	--	--	--	<0.21
1,2,4-Trichlorobenzene	70	14	<1.0	<0.21	--	--	--	--	--	<0.21
1,1,1-Trichloroethane (TCA)	200	40	<1.0	0.30J	--	--	--	--	--	<0.17
1,1,2-Trichloroethane (TCA)	5	0.5	<1.0	<0.15	--	--	--	--	--	<0.15
Trichloroethene (TCE)	5	0.5	<0.40	<0.20	--	--	--	--	--	<0.20
Trichlorofluoromethane	NP	NP	<1.0	<0.33	--	--	--	--	--	<0.33
1,2,3-Trichloropropane*	60	12	<4.0	<0.28	--	--	--	--	--	<0.28
1,1,2-Trichlorofluoroethane	NP	NP	<1.0	<0.32	--	--	--	--	--	<0.32
1,2,4-Trimethylbenzene	480	96	1.6	0.21J	--	--	--	--	--	<0.18
1,3,5-Trimethylbenzene			<1.0	<0.27	--	--	--	--	--	--
Vinyl Chloride	0.2	0.02	<0.40	<0.29	--	--	--	--	--	<0.29
Xylene (total)	2000	400	<3.0	<0.32	--	--	--	--	--	<0.32

Table 3: Groundwater Analytical Summary
Fraser Shipyards - Punch Shed Addition

All results in ug/L	Sample ID		PS-MW-4							HCL Trip
	Sample Date		4/27/2016	7/19/2016	1/10/2017	8/23/2018	3/19/2019	8/21/2019	8/21/2019	7/19/2016
PAHs										
Acenaphthene	NP	NP	0.26	0.047	0.037	0.041	0.060	<0.013	<0.014	--
Acenaphthylene	NP	NP	<0.041	0.031	0.071	<0.00047	<0.0047	<0.010	<0.011	--
Anthracene	3000	600	0.058	0.071	0.140	0.100	0.015	<0.011	<0.012	--
Benzo(a)anthracene	NP	NP	0.14	0.23	0.48	0.32	<0.0039	<0.0086	<0.0091	--
Benzo(a)pyrene	0.2	0.02	0.14	0.27	0.56	0.36	<0.0041	<0.0061	<0.0064	--
Benzo(b)fluoranthene	0.2	0.02	0.20	0.36	0.69	0.54	<0.013	<0.0095	<0.010	--
Benzo(g,h,i)perylene	NP	NP	0.11	0.19	0.42	0.28	<0.0099	<0.010	<0.011	--
Benzo(k)fluoranthene	NP	NP	0.074	0.130	0.280	0.180	<0.011	<0.0071	<0.0074	--
Chrysene	0.2	0.02	0.14	0.27	0.53	0.36	<0.0093	<0.011	<0.012	--
Dibenzo(a,h)anthracene	NP	NP	<0.041	0.040	0.099	0.047	<0.0093	<0.0092	<0.0097	--
Fluoranthene	400	80	0.39	0.58	1.30	0.82	<0.018	<0.011	<0.012	--
Fluorene	400	80	0.065	0.027	0.048	<0.0060	<0.0060	0.011J	0.013J	--
Indeno(1,2,3-cd)pyrene	NP	NP	0.088	0.16	0.36	0.22	<0.013	<0.0058	<0.0062	--
Naphthalene	100	10	0.11	0.055	0.075	<0.0069	<0.0069	0.016J	<0.015	--
Phenanthrene	NP	NP	0.34	0.30	0.65	0.44	0.230	0.022J	0.018J	--
Pyrene	250	50	0.32	0.56	0.99	0.79	<0.015	<0.0070	<0.0074	--

29.5	Exceeds WDNR PAL & ES
0.081	Exceeds WDNR PAL, but not ES
<0.081	MDL exceeds WDNR PAL, but not ES
0.35	Detected above reporting limit
--	Not analyzed
NP	Not published

Fraser Vapor Intrusion Test - 11/12/19

Location (Figure 5-2)	Tested	PID (PPM)	Notes
1	Ambient	1.9	Front entry to Punch Shed addition. Kitchen, shelf storage, bathroom. Floor intact.
2	Floor Drain	1.9	Bathroom in Punch Shed addition.
3	Ambient	5	North corner of Punch Shed addition. Workbenches w/ chemicals (brake cleaner).
4	Floor Drain/Ambient	0.2/0.2	North garage portion of Punch Shed addition.
5	Ambient	0	Area surrounding GP-6, floor intact.
6	Ambient	0	Area surrounding GP-5, floor intact.
7	Ambient/Floor Crack	0/0	Area surrounding GP-10 and GP-11, cracks throughout floor.
8	Ambient/Floor Crack	0/0	Welding area in Punch Shed west of plume, cracks throughout floor.
9	Stormdrain	0	Roof drain effluent on Northeast edge of Punch Shed addition.
10	Ambient	0	Area surrounding GP-7.
11	Ambient	0	Area surrounding GP-14.

*no change in PPM while spot checking conduit throughout Punch Shed.

May 13, 2019

Mr. John McCarthy
Environmental Troubleshooters
3825 Grand Avenue
Duluth, MN 55807

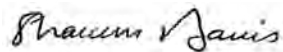
RE: Project: 14-1004 Fraser Shipyard
Pace Project No.: 10473428

Dear Mr. McCarthy:

Enclosed are the analytical results for sample(s) received by the laboratory on May 03, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Shawn Davis
shawn.davis@pacelabs.com
612-607-6378
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 14-1004 Fraser Shipyard

Pace Project No.: 10473428

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas DW Certification #: MN00064

Arkansas WW Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Minnesota Dept of Ag Certification #: via MN 027-053-137

Minnesota Petrofund Certification #: 1240

Mississippi Certification #: MN00064

Missouri Certification #: 10100

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon Primary Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Vermont Certification #: VT-027053137

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DEP Certification #: 382

West Virginia DW Certification #: 9952 C

Wisconsin Certification #: 999407970

Wyoming UST Certification #: via A2LA 2926.01

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SAMPLE SUMMARY

Project: 14-1004 Fraser Shipyard

Pace Project No.: 10473428

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10473428001	PS-mw-1	Water	05/02/19 14:40	05/03/19 18:45
10473428002	PS-mw-2	Water	05/02/19 12:15	05/03/19 18:45
10473428003	PS-mw-3	Water	05/02/19 18:15	05/03/19 18:45
10473428004	PS-mw-3.1	Water	05/02/19 18:20	05/03/19 18:45
10473428005	PS-mw-4	Water	05/02/19 17:00	05/03/19 18:45

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SAMPLE ANALYTE COUNT

Project: 14-1004 Fraser Shipyard

Pace Project No.: 10473428

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10473428001	PS-mw-1	EPA 8270D by SIM	SNG	18
10473428002	PS-mw-2	EPA 8270D by SIM	SNG	18
10473428003	PS-mw-3	EPA 8270D by SIM	SNG	18
10473428004	PS-mw-3.1	EPA 8270D by SIM	SNG	18
10473428005	PS-mw-4	EPA 8270D by SIM	SNG	18

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ANALYTICAL RESULTS

Project: 14-1004 Fraser Shipyard

Pace Project No.: 10473428

Sample: PS-mw-1 Lab ID: **10473428001** Collected: 05/02/19 14:40 Received: 05/03/19 18:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA Mod. 3510C									
Acenaphthene	0.23	ug/L	0.011	0.0034	1	05/08/19 13:32	05/13/19 14:03	83-32-9	
Acenaphthylene	<0.0049	ug/L	0.016	0.0049	1	05/08/19 13:32	05/13/19 14:03	208-96-8	
Anthracene	<0.0065	ug/L	0.022	0.0065	1	05/08/19 13:32	05/13/19 14:03	120-12-7	
Benzo(a)anthracene	<0.0041	ug/L	0.014	0.0041	1	05/08/19 13:32	05/13/19 14:03	56-55-3	
Benzo(a)pyrene	<0.0042	ug/L	0.014	0.0042	1	05/08/19 13:32	05/13/19 14:03	50-32-8	
Benzo(b)fluoranthene	<0.013	ug/L	0.045	0.013	1	05/08/19 13:32	05/13/19 14:03	205-99-2	
Benzo(g,h,i)perylene	<0.010	ug/L	0.034	0.010	1	05/08/19 13:32	05/13/19 14:03	191-24-2	
Benzo(k)fluoranthene	<0.011	ug/L	0.036	0.011	1	05/08/19 13:32	05/13/19 14:03	207-08-9	
Chrysene	<0.0097	ug/L	0.032	0.0097	1	05/08/19 13:32	05/13/19 14:03	218-01-9	
Dibenz(a,h)anthracene	<0.0097	ug/L	0.032	0.0097	1	05/08/19 13:32	05/13/19 14:03	53-70-3	
Fluoranthene	<0.019	ug/L	0.064	0.019	1	05/08/19 13:32	05/13/19 14:03	206-44-0	
Fluorene	<0.0063	ug/L	0.021	0.0063	1	05/08/19 13:32	05/13/19 14:03	86-73-7	
Indeno(1,2,3-cd)pyrene	<0.014	ug/L	0.047	0.014	1	05/08/19 13:32	05/13/19 14:03	193-39-5	
Naphthalene	0.053	ug/L	0.024	0.0072	1	05/08/19 13:32	05/13/19 14:03	91-20-3	
Phenanthrene	0.020J	ug/L	0.037	0.011	1	05/08/19 13:32	05/13/19 14:03	85-01-8	
Pyrene	<0.015	ug/L	0.052	0.015	1	05/08/19 13:32	05/13/19 14:03	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	97	%	47-125		1	05/08/19 13:32	05/13/19 14:03	321-60-8	
p-Terphenyl-d14 (S)	112	%	62-125		1	05/08/19 13:32	05/13/19 14:03	1718-51-0	

Sample: PS-mw-2 Lab ID: **10473428002** Collected: 05/02/19 12:15 Received: 05/03/19 18:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA Mod. 3510C									
Acenaphthene	<0.0033	ug/L	0.011	0.0033	1	05/08/19 13:32	05/10/19 16:45	83-32-9	
Acenaphthylene	<0.0048	ug/L	0.016	0.0048	1	05/08/19 13:32	05/10/19 16:45	208-96-8	
Anthracene	<0.0064	ug/L	0.021	0.0064	1	05/08/19 13:32	05/10/19 16:45	120-12-7	
Benzo(a)anthracene	<0.0041	ug/L	0.014	0.0041	1	05/08/19 13:32	05/10/19 16:45	56-55-3	
Benzo(a)pyrene	<0.0042	ug/L	0.014	0.0042	1	05/08/19 13:32	05/10/19 16:45	50-32-8	
Benzo(b)fluoranthene	<0.013	ug/L	0.044	0.013	1	05/08/19 13:32	05/10/19 16:45	205-99-2	
Benzo(g,h,i)perylene	<0.010	ug/L	0.034	0.010	1	05/08/19 13:32	05/10/19 16:45	191-24-2	
Benzo(k)fluoranthene	<0.011	ug/L	0.036	0.011	1	05/08/19 13:32	05/10/19 16:45	207-08-9	
Chrysene	<0.0096	ug/L	0.032	0.0096	1	05/08/19 13:32	05/10/19 16:45	218-01-9	
Dibenz(a,h)anthracene	<0.0096	ug/L	0.032	0.0096	1	05/08/19 13:32	05/10/19 16:45	53-70-3	
Fluoranthene	<0.019	ug/L	0.063	0.019	1	05/08/19 13:32	05/10/19 16:45	206-44-0	
Fluorene	<0.0062	ug/L	0.021	0.0062	1	05/08/19 13:32	05/10/19 16:45	86-73-7	
Indeno(1,2,3-cd)pyrene	<0.014	ug/L	0.046	0.014	1	05/08/19 13:32	05/10/19 16:45	193-39-5	
Naphthalene	<0.0071	ug/L	0.024	0.0071	1	05/08/19 13:32	05/10/19 16:45	91-20-3	
Phenanthrene	<0.011	ug/L	0.036	0.011	1	05/08/19 13:32	05/10/19 16:45	85-01-8	
Pyrene	<0.015	ug/L	0.051	0.015	1	05/08/19 13:32	05/10/19 16:45	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	68	%	47-125		1	05/08/19 13:32	05/10/19 16:45	321-60-8	
p-Terphenyl-d14 (S)	85	%	62-125		1	05/08/19 13:32	05/10/19 16:45	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 14-1004 Fraser Shipyard

Pace Project No.: 10473428

Sample: PS-mw-3 **Lab ID: 10473428003** Collected: 05/02/19 18:15 Received: 05/03/19 18:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA Mod. 3510C									
Acenaphthene	1.1	ug/L	0.011	0.0034	1	05/08/19 13:32	05/10/19 17:10	83-32-9	
Acenaphthylene	<0.0049	ug/L	0.016	0.0049	1	05/08/19 13:32	05/10/19 17:10	208-96-8	
Anthracene	0.079	ug/L	0.022	0.0065	1	05/08/19 13:32	05/10/19 17:10	120-12-7	
Benzo(a)anthracene	<0.0041	ug/L	0.014	0.0041	1	05/08/19 13:32	05/10/19 17:10	56-55-3	
Benzo(a)pyrene	<0.0042	ug/L	0.014	0.0042	1	05/08/19 13:32	05/10/19 17:10	50-32-8	
Benzo(b)fluoranthene	<0.013	ug/L	0.045	0.013	1	05/08/19 13:32	05/10/19 17:10	205-99-2	
Benzo(g,h,i)perylene	<0.010	ug/L	0.034	0.010	1	05/08/19 13:32	05/10/19 17:10	191-24-2	
Benzo(k)fluoranthene	<0.011	ug/L	0.036	0.011	1	05/08/19 13:32	05/10/19 17:10	207-08-9	
Chrysene	<0.0097	ug/L	0.032	0.0097	1	05/08/19 13:32	05/10/19 17:10	218-01-9	
Dibenz(a,h)anthracene	<0.0097	ug/L	0.032	0.0097	1	05/08/19 13:32	05/10/19 17:10	53-70-3	
Fluoranthene	0.052J	ug/L	0.064	0.019	1	05/08/19 13:32	05/10/19 17:10	206-44-0	
Fluorene	0.45	ug/L	0.021	0.0063	1	05/08/19 13:32	05/10/19 17:10	86-73-7	
Indeno(1,2,3-cd)pyrene	<0.014	ug/L	0.047	0.014	1	05/08/19 13:32	05/10/19 17:10	193-39-5	
Naphthalene	0.37	ug/L	0.024	0.0072	1	05/08/19 13:32	05/10/19 17:10	91-20-3	
Phenanthrene	0.56	ug/L	0.037	0.011	1	05/08/19 13:32	05/10/19 17:10	85-01-8	
Pyrene	0.030J	ug/L	0.052	0.015	1	05/08/19 13:32	05/10/19 17:10	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	72	%	47-125		1	05/08/19 13:32	05/10/19 17:10	321-60-8	
p-Terphenyl-d14 (S)	83	%	62-125		1	05/08/19 13:32	05/10/19 17:10	1718-51-0	

Sample: PS-mw-3.1 **Lab ID: 10473428004** Collected: 05/02/19 18:20 Received: 05/03/19 18:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA Mod. 3510C									
Acenaphthene	0.98	ug/L	0.011	0.0033	1	05/08/19 13:32	05/10/19 17:34	83-32-9	
Acenaphthylene	<0.0048	ug/L	0.016	0.0048	1	05/08/19 13:32	05/10/19 17:34	208-96-8	
Anthracene	0.12	ug/L	0.021	0.0064	1	05/08/19 13:32	05/10/19 17:34	120-12-7	
Benzo(a)anthracene	<0.0040	ug/L	0.013	0.0040	1	05/08/19 13:32	05/10/19 17:34	56-55-3	
Benzo(a)pyrene	<0.0041	ug/L	0.014	0.0041	1	05/08/19 13:32	05/10/19 17:34	50-32-8	
Benzo(b)fluoranthene	<0.013	ug/L	0.044	0.013	1	05/08/19 13:32	05/10/19 17:34	205-99-2	
Benzo(g,h,i)perylene	<0.010	ug/L	0.034	0.010	1	05/08/19 13:32	05/10/19 17:34	191-24-2	
Benzo(k)fluoranthene	<0.011	ug/L	0.036	0.011	1	05/08/19 13:32	05/10/19 17:34	207-08-9	
Chrysene	<0.0095	ug/L	0.032	0.0095	1	05/08/19 13:32	05/10/19 17:34	218-01-9	
Dibenz(a,h)anthracene	<0.0095	ug/L	0.032	0.0095	1	05/08/19 13:32	05/10/19 17:34	53-70-3	
Fluoranthene	0.054J	ug/L	0.063	0.019	1	05/08/19 13:32	05/10/19 17:34	206-44-0	
Fluorene	0.44	ug/L	0.020	0.0061	1	05/08/19 13:32	05/10/19 17:34	86-73-7	
Indeno(1,2,3-cd)pyrene	<0.014	ug/L	0.046	0.014	1	05/08/19 13:32	05/10/19 17:34	193-39-5	
Naphthalene	0.34	ug/L	0.023	0.0070	1	05/08/19 13:32	05/10/19 17:34	91-20-3	
Phenanthrene	0.56	ug/L	0.036	0.011	1	05/08/19 13:32	05/10/19 17:34	85-01-8	
Pyrene	0.036J	ug/L	0.050	0.015	1	05/08/19 13:32	05/10/19 17:34	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	68	%	47-125		1	05/08/19 13:32	05/10/19 17:34	321-60-8	
p-Terphenyl-d14 (S)	84	%	62-125		1	05/08/19 13:32	05/10/19 17:34	1718-51-0	

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ANALYTICAL RESULTS

Project: 14-1004 Fraser Shipyard

Pace Project No.: 10473428

Sample: PS-mw-4 **Lab ID: 10473428005** Collected: 05/02/19 17:00 Received: 05/03/19 18:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA Mod. 3510C							
Acenaphthene	0.060	ug/L	0.011	0.0032	1	05/08/19 13:32	05/10/19 17:58	83-32-9	
Acenaphthylene	<0.0047	ug/L	0.016	0.0047	1	05/08/19 13:32	05/10/19 17:58	208-96-8	
Anthracene	0.015J	ug/L	0.021	0.0062	1	05/08/19 13:32	05/10/19 17:58	120-12-7	
Benzo(a)anthracene	<0.0039	ug/L	0.013	0.0039	1	05/08/19 13:32	05/10/19 17:58	56-55-3	
Benzo(a)pyrene	<0.0041	ug/L	0.013	0.0041	1	05/08/19 13:32	05/10/19 17:58	50-32-8	
Benzo(b)fluoranthene	<0.013	ug/L	0.043	0.013	1	05/08/19 13:32	05/10/19 17:58	205-99-2	
Benzo(g,h,i)perylene	<0.0099	ug/L	0.033	0.0099	1	05/08/19 13:32	05/10/19 17:58	191-24-2	
Benzo(k)fluoranthene	<0.011	ug/L	0.035	0.011	1	05/08/19 13:32	05/10/19 17:58	207-08-9	
Chrysene	<0.0093	ug/L	0.031	0.0093	1	05/08/19 13:32	05/10/19 17:58	218-01-9	
Dibenz(a,h)anthracene	<0.0093	ug/L	0.031	0.0093	1	05/08/19 13:32	05/10/19 17:58	53-70-3	
Fluoranthene	<0.018	ug/L	0.062	0.018	1	05/08/19 13:32	05/10/19 17:58	206-44-0	
Fluorene	<0.0060	ug/L	0.020	0.0060	1	05/08/19 13:32	05/10/19 17:58	86-73-7	
Indeno(1,2,3-cd)pyrene	<0.013	ug/L	0.045	0.013	1	05/08/19 13:32	05/10/19 17:58	193-39-5	
Naphthalene	<0.0069	ug/L	0.023	0.0069	1	05/08/19 13:32	05/10/19 17:58	91-20-3	
Phenanthrene	0.023J	ug/L	0.035	0.011	1	05/08/19 13:32	05/10/19 17:58	85-01-8	
Pyrene	<0.015	ug/L	0.049	0.015	1	05/08/19 13:32	05/10/19 17:58	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	57	%	47-125		1	05/08/19 13:32	05/10/19 17:58	321-60-8	
p-Terphenyl-d14 (S)	88	%	62-125		1	05/08/19 13:32	05/10/19 17:58	1718-51-0	

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QUALITY CONTROL DATA

Project: 14-1004 Fraser Shipyard
Pace Project No.: 10473428

QC Batch: 604517 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA Mod. 3510C Analysis Description: 8270D PAH by SIM MSSV
Associated Lab Samples: 10473428001, 10473428002, 10473428003, 10473428004, 10473428005

METHOD BLANK: 3268096 Matrix: Water
Associated Lab Samples: 10473428001, 10473428002, 10473428003, 10473428004, 10473428005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/L	<0.0032	0.011	05/10/19 10:00	
Acenaphthylene	ug/L	<0.0046	0.015	05/10/19 10:00	
Anthracene	ug/L	<0.0062	0.021	05/10/19 10:00	
Benzo(a)anthracene	ug/L	<0.0039	0.013	05/10/19 10:00	
Benzo(a)pyrene	ug/L	<0.0040	0.013	05/10/19 10:00	
Benzo(b)fluoranthene	ug/L	<0.013	0.042	05/10/19 10:00	
Benzo(g,h,i)perylene	ug/L	<0.0098	0.033	05/10/19 10:00	
Benzo(k)fluoranthene	ug/L	<0.010	0.035	05/10/19 10:00	
Chrysene	ug/L	<0.0092	0.031	05/10/19 10:00	
Dibenz(a,h)anthracene	ug/L	<0.0092	0.031	05/10/19 10:00	
Fluoranthene	ug/L	<0.018	0.061	05/10/19 10:00	
Fluorene	ug/L	<0.0059	0.020	05/10/19 10:00	
Indeno(1,2,3-cd)pyrene	ug/L	<0.013	0.044	05/10/19 10:00	
Naphthalene	ug/L	<0.0068	0.023	05/10/19 10:00	
Phenanthrene	ug/L	<0.010	0.035	05/10/19 10:00	
Pyrene	ug/L	<0.015	0.049	05/10/19 10:00	
2-Fluorobiphenyl (S)	%	72	47-125	05/10/19 10:00	
p-Terphenyl-d14 (S)	%	96	62-125	05/10/19 10:00	

LABORATORY CONTROL SAMPLE: 3268097

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/L	1	0.67	67	50-125	
Acenaphthylene	ug/L	1	0.67	67	46-125	
Anthracene	ug/L	1	1.1	112	59-125	
Benzo(a)anthracene	ug/L	1	0.61	61	55-125	
Benzo(a)pyrene	ug/L	1	0.85	85	66-125	
Benzo(b)fluoranthene	ug/L	1	0.72	72	64-125	
Benzo(g,h,i)perylene	ug/L	1	0.90	90	58-125	
Benzo(k)fluoranthene	ug/L	1	0.95	95	60-125	
Chrysene	ug/L	1	0.98	98	62-125	
Dibenz(a,h)anthracene	ug/L	1	1.0	102	51-125	
Fluoranthene	ug/L	1	0.87	87	64-125	
Fluorene	ug/L	1	0.71	71	55-125	
Indeno(1,2,3-cd)pyrene	ug/L	1	0.90	90	61-125	
Naphthalene	ug/L	1	0.70	70	48-125	
Phenanthrene	ug/L	1	0.77	77	63-125	
Pyrene	ug/L	1	0.77	77	61-125	
2-Fluorobiphenyl (S)	%			66	47-125	
p-Terphenyl-d14 (S)	%			80	62-125	

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QUALITY CONTROL DATA

Project: 14-1004 Fraser Shipyard

Pace Project No.: 10473428

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3268297		3268298		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10473879001 Result	MS Spike Conc.	MSD Spike Conc.									
Acenaphthene	ug/L	ND	3	3	2.1	2.4	70	77	46-125	10	30		
Acenaphthylene	ug/L	ND	3	3	2.0	2.3	67	76	48-125	13	30		
Anthracene	ug/L	ND	3	3	3.8	4.1	124	133	59-125	7	30	M1	
Benzo(a)anthracene	ug/L	ND	3	3	1.5	1.7	50	57	56-125	14	30	M1	
Benzo(a)pyrene	ug/L	ND	3	3	2.5	2.4	81	79	58-125	3	30		
Benzo(b)fluoranthene	ug/L	ND	3	3	2.3	2.3	75	75	51-125	0	30		
Benzo(g,h,i)perylene	ug/L	ND	3	3	2.8	2.8	90	90	50-125	0	30		
Benzo(k)fluoranthene	ug/L	ND	3	3	2.9	3.1	95	100	52-125	6	30		
Chrysene	ug/L	ND	3	3	3.7	3.6	121	119	58-125	2	30		
Dibenz(a,h)anthracene	ug/L	ND	3	3	3.0	3.1	99	103	45-125	4	30		
Fluoranthene	ug/L	ND	3	3	2.9	3.1	96	101	60-125	5	30		
Fluorene	ug/L	ND	3	3	2.3	2.4	76	77	47-125	2	30		
Indeno(1,2,3-cd)pyrene	ug/L	ND	3	3	2.7	2.8	89	92	48-125	4	30		
Naphthalene	ug/L	ND	3	3	1.9	2.4	63	79	38-125	23	30		
Phenanthrene	ug/L	ND	3	3	2.7	2.8	85	91	60-125	6	30		
Pyrene	ug/L	ND	3	3	2.6	2.6	84	84	62-125	0	30		
2-Fluorobiphenyl (S)	%						61	71	47-125				
p-Terphenyl-d14 (S)	%						80	83	62-125				

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QUALIFIERS

Project: 14-1004 Fraser Shipyard

Pace Project No.: 10473428

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 14-1004 Fraser Shipyard

Pace Project No.: 10473428

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10473428001	PS-mw-1	EPA Mod. 3510C	604517	EPA 8270D by SIM	605069
10473428002	PS-mw-2	EPA Mod. 3510C	604517	EPA 8270D by SIM	605069
10473428003	PS-mw-3	EPA Mod. 3510C	604517	EPA 8270D by SIM	605069
10473428004	PS-mw-3.1	EPA Mod. 3510C	604517	EPA 8270D by SIM	605069
10473428005	PS-mw-4	EPA Mod. 3510C	604517	EPA 8270D by SIM	605069

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

2083572

Section A
Required Client Information:

Company: Environmental Troubleshooters
Address: 3825 Grand Avenue
Duluth MN 55803
Email To: smccarthy@etsmn.com
Phone: 218-722-6013 Fax:
Requested Due Date/TAT: Standard

Section B
Required Project Information:

Report To: John McCarthy
Copy To:
Purchase Order No.:
Project Name: Fraser Shipyard
Project Number: 14-1004


Section C
Invoice Information:

Attention: Same as Report to:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager: Shawn Davis
Pace Profile #:

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER
 UST RCRA OTHER _____

Site Location: WI
STATE: WI

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives							Analysis Test Y/N	Residual Chlc	Requested Analysis Filtered (Y/N)	WO#: 10473428  10473428	Pace Project No./ Lab I.D.												
					COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃	Methanol						Other											
					DATE	TIME	DATE	TIME																										
1	PS-MW-1		WT	G			5/2	1440	2	2																								
2	PS-MW-2		WT	G			5/2	1215	2	2																								
3	PS-MW-3		WT	G			5/2	1815	2	2																								
4	PS-MW-3.1		WT	G			5/2	1820	2	2																								
5	PS-MW-4		WT	G			5/2	1700	2	2																								
6																																		
7																																		
8																																		
9																																		
10																																		
11																																		
12																																		

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	<u>B. W.</u>	<u>5/31/19</u>	<u>1252</u>	<u>Ravena</u> <u>Traverse</u>	<u>5/31/19</u>	<u>1252</u>	<u>1.7</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>
					<u>5/31/19</u>	<u>1845</u>				

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ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brice Wizer

SIGNATURE of SAMPLER: B. W.

DATE Signed (MM/DD/YY): 05/02/19

Temp. in °C

Received on ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Sample Condition Upon Receipt **Client Name:** Environ Transducers **Project #:** **WO#: 10473428**

Courier: Fed Ex UPS USPS Client
 Pace SpeeDee Commercial See Exception

Tracking Number: _____

PM: SRD **Due Date: 05/13/19**
CLIENT: ENV TROUBLE

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Biological Tissue Frozen?** Yes No N/A

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer: T1(0461) T2(1336) T3(0459)
 T4(0254) T5(0048) **Type of Ice:** Wet Blue None Dry Melted

Note: Each West Virginia Sample must have temp taken (no temp blanks)

Temp should be above freezing to 5°C	Cooler Temp Read w/temp blank: <u>4.3</u> °C	Average Corrected Temp (no temp blank only): _____ °C	See Exceptions <input type="checkbox"/>
Correction Factor: <u>tm</u>	Cooler Temp Corrected w/temp blank: <u>4.3</u> °C		

USDA Regulated Soil: (N/A, water sample/Other: _____) **Date/Initials of Person Examining Contents:** 5/13/19

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, HI, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present and Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E coli <input type="checkbox"/> BOD/cBOD <input type="checkbox"/> Hex Chrome <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Field Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is sufficient information available to reconcile the samples to the COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Matrix: <input checked="" type="checkbox"/> Water <input type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other	11. If no, write ID/ Date/Time on Container Below: _____ See Exception <input type="checkbox"/>
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12. Sample # <input type="checkbox"/> NaOH <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> Zinc Acetate
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Positive for Res. <input type="checkbox"/> Yes <input type="checkbox"/> No See Exception <input type="checkbox"/> Chlorine? <input type="checkbox"/> Yes <input type="checkbox"/> No pH Paper Lot# _____
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Res. Chlorine 0-6 Roll 0-6 Strip 0-14 Strip
Headspace in VOA Vials (greater than 6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. See Exception <input type="checkbox"/>
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14. Pace Trip Blank Lot # (if purchased): <u>NA</u>

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Sharon Davis **Date:** 5/6/19

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

September 03, 2019

Mr. John McCarthy
Environmental Troubleshooters
3825 Grand Avenue
Duluth, MN 55807

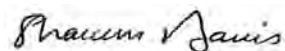
RE: Project: 14-1004 Fraser Ship Yard
Pace Project No.: 10488632

Dear Mr. McCarthy:

Enclosed are the analytical results for sample(s) received by the laboratory on August 22, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Shawn Davis
shawn.davis@pacelabs.com
612-607-6378
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 14-1004 Fraser Ship Yard

Pace Project No.: 10488632

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas DW Certification #: MN00064

Arkansas WW Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Minnesota Dept of Ag Certification #: via MN 027-053-137

Minnesota Petrofund Certification #: 1240

Mississippi Certification #: MN00064

Missouri Certification #: 10100

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon Primary Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Vermont Certification #: VT-027053137

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DEP Certification #: 382

West Virginia DW Certification #: 9952 C

Wisconsin Certification #: 999407970

Wyoming UST Certification #: via A2LA 2926.01

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 14-1004 Fraser Ship Yard

Pace Project No.: 10488632

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10488632001	PS-MW-4	Water	08/21/19 11:00	08/22/19 19:15
10488632002	PS-MW-4.1	Water	08/21/19 11:05	08/22/19 19:15
10488632003	PS-MW-3	Water	08/21/19 16:10	08/22/19 19:15
10488632004	PS-MW-2	Water	08/21/19 15:00	08/22/19 19:15
10488632005	PS-MW-1	Water	08/21/19 12:15	08/22/19 19:15

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 14-1004 Fraser Ship Yard

Pace Project No.: 10488632

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10488632001	PS-MW-4	EPA 8270D by SIM	CH3	18
10488632002	PS-MW-4.1	EPA 8270D by SIM	CH3	18
10488632003	PS-MW-3	EPA 8270D by SIM	CH3	18
10488632004	PS-MW-2	EPA 8270D by SIM	CH3	18
10488632005	PS-MW-1	EPA 8270D by SIM	CH3	18

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 14-1004 Fraser Ship Yard

Pace Project No.: 10488632

Sample: PS-MW-4 **Lab ID: 10488632001** Collected: 08/21/19 11:00 Received: 08/22/19 19:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA Mod. 3510C									
Acenaphthene	<0.013	ug/L	0.044	0.013	1	08/23/19 15:13	08/26/19 20:03	83-32-9	
Acenaphthylene	<0.010	ug/L	0.034	0.010	1	08/23/19 15:13	08/26/19 20:03	208-96-8	
Anthracene	<0.011	ug/L	0.036	0.011	1	08/23/19 15:13	08/26/19 20:03	120-12-7	
Benzo(a)anthracene	<0.0086	ug/L	0.029	0.0086	1	08/23/19 15:13	08/26/19 20:03	56-55-3	
Benzo(a)pyrene	<0.0061	ug/L	0.020	0.0061	1	08/23/19 15:13	08/26/19 20:03	50-32-8	
Benzo(b)fluoranthene	<0.0095	ug/L	0.032	0.0095	1	08/23/19 15:13	08/26/19 20:03	205-99-2	
Benzo(g,h,i)perylene	<0.010	ug/L	0.034	0.010	1	08/23/19 15:13	08/26/19 20:03	191-24-2	
Benzo(k)fluoranthene	<0.0071	ug/L	0.023	0.0071	1	08/23/19 15:13	08/26/19 20:03	207-08-9	
Chrysene	<0.011	ug/L	0.037	0.011	1	08/23/19 15:13	08/26/19 20:03	218-01-9	
Dibenz(a,h)anthracene	<0.0092	ug/L	0.031	0.0092	1	08/23/19 15:13	08/26/19 20:03	53-70-3	
Fluoranthene	<0.011	ug/L	0.036	0.011	1	08/23/19 15:13	08/26/19 20:03	206-44-0	
Fluorene	0.011J	ug/L	0.019	0.0058	1	08/23/19 15:13	08/26/19 20:03	86-73-7	
Indeno(1,2,3-cd)pyrene	<0.0058	ug/L	0.019	0.0058	1	08/23/19 15:13	08/26/19 20:03	193-39-5	
Naphthalene	0.016J	ug/L	0.046	0.014	1	08/23/19 15:13	08/26/19 20:03	91-20-3	
Phenanthrene	0.022J	ug/L	0.025	0.0074	1	08/23/19 15:13	08/26/19 20:03	85-01-8	
Pyrene	<0.0070	ug/L	0.023	0.0070	1	08/23/19 15:13	08/26/19 20:03	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	65	%	47-125		1	08/23/19 15:13	08/26/19 20:03	321-60-8	
p-Terphenyl-d14 (S)	77	%	62-125		1	08/23/19 15:13	08/26/19 20:03	1718-51-0	

Sample: PS-MW-4.1 **Lab ID: 10488632002** Collected: 08/21/19 11:05 Received: 08/22/19 19:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA Mod. 3510C									
Acenaphthene	<0.014	ug/L	0.047	0.014	1	08/23/19 15:13	08/26/19 20:24	83-32-9	
Acenaphthylene	<0.011	ug/L	0.036	0.011	1	08/23/19 15:13	08/26/19 20:24	208-96-8	
Anthracene	<0.012	ug/L	0.039	0.012	1	08/23/19 15:13	08/26/19 20:24	120-12-7	
Benzo(a)anthracene	<0.0091	ug/L	0.030	0.0091	1	08/23/19 15:13	08/26/19 20:24	56-55-3	
Benzo(a)pyrene	<0.0064	ug/L	0.021	0.0064	1	08/23/19 15:13	08/26/19 20:24	50-32-8	
Benzo(b)fluoranthene	<0.010	ug/L	0.033	0.010	1	08/23/19 15:13	08/26/19 20:24	205-99-2	
Benzo(g,h,i)perylene	<0.011	ug/L	0.036	0.011	1	08/23/19 15:13	08/26/19 20:24	191-24-2	
Benzo(k)fluoranthene	<0.0074	ug/L	0.025	0.0074	1	08/23/19 15:13	08/26/19 20:24	207-08-9	
Chrysene	<0.012	ug/L	0.039	0.012	1	08/23/19 15:13	08/26/19 20:24	218-01-9	
Dibenz(a,h)anthracene	<0.0097	ug/L	0.032	0.0097	1	08/23/19 15:13	08/26/19 20:24	53-70-3	
Fluoranthene	<0.012	ug/L	0.039	0.012	1	08/23/19 15:13	08/26/19 20:24	206-44-0	
Fluorene	0.013J	ug/L	0.020	0.0061	1	08/23/19 15:13	08/26/19 20:24	86-73-7	
Indeno(1,2,3-cd)pyrene	<0.0062	ug/L	0.021	0.0062	1	08/23/19 15:13	08/26/19 20:24	193-39-5	
Naphthalene	<0.015	ug/L	0.049	0.015	1	08/23/19 15:13	08/26/19 20:24	91-20-3	
Phenanthrene	0.018J	ug/L	0.026	0.0078	1	08/23/19 15:13	08/26/19 20:24	85-01-8	
Pyrene	<0.0074	ug/L	0.025	0.0074	1	08/23/19 15:13	08/26/19 20:24	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	73	%	47-125		1	08/23/19 15:13	08/26/19 20:24	321-60-8	
p-Terphenyl-d14 (S)	81	%	62-125		1	08/23/19 15:13	08/26/19 20:24	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 14-1004 Fraser Ship Yard

Pace Project No.: 10488632

Sample: PS-MW-3 **Lab ID: 10488632003** Collected: 08/21/19 16:10 Received: 08/22/19 19:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA Mod. 3510C									
Acenaphthene	1.6	ug/L	0.044	0.013	1	08/23/19 15:13	08/26/19 20:45	83-32-9	
Acenaphthylene	0.011J	ug/L	0.034	0.010	1	08/23/19 15:13	08/26/19 20:45	208-96-8	
Anthracene	0.084	ug/L	0.036	0.011	1	08/23/19 15:13	08/26/19 20:45	120-12-7	
Benzo(a)anthracene	<0.0086	ug/L	0.029	0.0086	1	08/23/19 15:13	08/26/19 20:45	56-55-3	
Benzo(a)pyrene	<0.0061	ug/L	0.020	0.0061	1	08/23/19 15:13	08/26/19 20:45	50-32-8	
Benzo(b)fluoranthene	<0.0095	ug/L	0.032	0.0095	1	08/23/19 15:13	08/26/19 20:45	205-99-2	
Benzo(g,h,i)perylene	<0.010	ug/L	0.034	0.010	1	08/23/19 15:13	08/26/19 20:45	191-24-2	
Benzo(k)fluoranthene	<0.0071	ug/L	0.023	0.0071	1	08/23/19 15:13	08/26/19 20:45	207-08-9	
Chrysene	<0.011	ug/L	0.037	0.011	1	08/23/19 15:13	08/26/19 20:45	218-01-9	
Dibenz(a,h)anthracene	<0.0092	ug/L	0.031	0.0092	1	08/23/19 15:13	08/26/19 20:45	53-70-3	
Fluoranthene	0.070	ug/L	0.036	0.011	1	08/23/19 15:13	08/26/19 20:45	206-44-0	
Fluorene	0.70	ug/L	0.019	0.0058	1	08/23/19 15:13	08/26/19 20:45	86-73-7	
Indeno(1,2,3-cd)pyrene	<0.0058	ug/L	0.019	0.0058	1	08/23/19 15:13	08/26/19 20:45	193-39-5	
Naphthalene	0.54	ug/L	0.046	0.014	1	08/23/19 15:13	08/26/19 20:45	91-20-3	
Phenanthrene	0.98	ug/L	0.025	0.0074	1	08/23/19 15:13	08/26/19 20:45	85-01-8	
Pyrene	0.048	ug/L	0.023	0.0070	1	08/23/19 15:13	08/26/19 20:45	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	72	%	47-125		1	08/23/19 15:13	08/26/19 20:45	321-60-8	
p-Terphenyl-d14 (S)	78	%	62-125		1	08/23/19 15:13	08/26/19 20:45	1718-51-0	

Sample: PS-MW-2 **Lab ID: 10488632004** Collected: 08/21/19 15:00 Received: 08/22/19 19:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA Mod. 3510C									
Acenaphthene	<0.013	ug/L	0.044	0.013	1	08/23/19 15:13	08/26/19 21:06	83-32-9	
Acenaphthylene	<0.010	ug/L	0.034	0.010	1	08/23/19 15:13	08/26/19 21:06	208-96-8	
Anthracene	0.011J	ug/L	0.036	0.011	1	08/23/19 15:13	08/26/19 21:06	120-12-7	
Benzo(a)anthracene	<0.0086	ug/L	0.029	0.0086	1	08/23/19 15:13	08/26/19 21:06	56-55-3	
Benzo(a)pyrene	<0.0061	ug/L	0.020	0.0061	1	08/23/19 15:13	08/26/19 21:06	50-32-8	
Benzo(b)fluoranthene	<0.0095	ug/L	0.032	0.0095	1	08/23/19 15:13	08/26/19 21:06	205-99-2	
Benzo(g,h,i)perylene	<0.010	ug/L	0.034	0.010	1	08/23/19 15:13	08/26/19 21:06	191-24-2	
Benzo(k)fluoranthene	<0.0071	ug/L	0.023	0.0071	1	08/23/19 15:13	08/26/19 21:06	207-08-9	
Chrysene	<0.011	ug/L	0.037	0.011	1	08/23/19 15:13	08/26/19 21:06	218-01-9	
Dibenz(a,h)anthracene	<0.0092	ug/L	0.031	0.0092	1	08/23/19 15:13	08/26/19 21:06	53-70-3	
Fluoranthene	<0.011	ug/L	0.036	0.011	1	08/23/19 15:13	08/26/19 21:06	206-44-0	
Fluorene	<0.0058	ug/L	0.019	0.0058	1	08/23/19 15:13	08/26/19 21:06	86-73-7	
Indeno(1,2,3-cd)pyrene	<0.0058	ug/L	0.019	0.0058	1	08/23/19 15:13	08/26/19 21:06	193-39-5	
Naphthalene	0.025J	ug/L	0.046	0.014	1	08/23/19 15:13	08/26/19 21:06	91-20-3	
Phenanthrene	0.021J	ug/L	0.025	0.0074	1	08/23/19 15:13	08/26/19 21:06	85-01-8	
Pyrene	<0.0070	ug/L	0.023	0.0070	1	08/23/19 15:13	08/26/19 21:06	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	67	%	47-125		1	08/23/19 15:13	08/26/19 21:06	321-60-8	
p-Terphenyl-d14 (S)	74	%	62-125		1	08/23/19 15:13	08/26/19 21:06	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 14-1004 Fraser Ship Yard

Pace Project No.: 10488632

Sample: PS-MW-1 **Lab ID: 10488632005** Collected: 08/21/19 12:15 Received: 08/22/19 19:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA Mod. 3510C							
Acenaphthene	0.12	ug/L	0.046	0.014	1	08/23/19 15:13	08/26/19 21:28	83-32-9	
Acenaphthylene	<0.011	ug/L	0.036	0.011	1	08/23/19 15:13	08/26/19 21:28	208-96-8	
Anthracene	<0.011	ug/L	0.038	0.011	1	08/23/19 15:13	08/26/19 21:28	120-12-7	
Benzo(a)anthracene	<0.0090	ug/L	0.030	0.0090	1	08/23/19 15:13	08/26/19 21:28	56-55-3	
Benzo(a)pyrene	<0.0063	ug/L	0.021	0.0063	1	08/23/19 15:13	08/26/19 21:28	50-32-8	
Benzo(b)fluoranthene	<0.0099	ug/L	0.033	0.0099	1	08/23/19 15:13	08/26/19 21:28	205-99-2	
Benzo(g,h,i)perylene	<0.011	ug/L	0.035	0.011	1	08/23/19 15:13	08/26/19 21:28	191-24-2	
Benzo(k)fluoranthene	<0.0074	ug/L	0.025	0.0074	1	08/23/19 15:13	08/26/19 21:28	207-08-9	
Chrysene	<0.012	ug/L	0.039	0.012	1	08/23/19 15:13	08/26/19 21:28	218-01-9	
Dibenz(a,h)anthracene	<0.0096	ug/L	0.032	0.0096	1	08/23/19 15:13	08/26/19 21:28	53-70-3	
Fluoranthene	<0.011	ug/L	0.038	0.011	1	08/23/19 15:13	08/26/19 21:28	206-44-0	
Fluorene	0.035	ug/L	0.020	0.0060	1	08/23/19 15:13	08/26/19 21:28	86-73-7	
Indeno(1,2,3-cd)pyrene	<0.0061	ug/L	0.020	0.0061	1	08/23/19 15:13	08/26/19 21:28	193-39-5	
Naphthalene	0.059	ug/L	0.048	0.014	1	08/23/19 15:13	08/26/19 21:28	91-20-3	
Phenanthrene	0.027	ug/L	0.026	0.0078	1	08/23/19 15:13	08/26/19 21:28	85-01-8	
Pyrene	0.0084J	ug/L	0.024	0.0073	1	08/23/19 15:13	08/26/19 21:28	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	72	%	47-125		1	08/23/19 15:13	08/26/19 21:28	321-60-8	
p-Terphenyl-d14 (S)	77	%	62-125		1	08/23/19 15:13	08/26/19 21:28	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 14-1004 Fraser Ship Yard

Pace Project No.: 10488632

QC Batch: 628177

Analysis Method: EPA 8270D by SIM

QC Batch Method: EPA Mod. 3510C

Analysis Description: 8270D PAH by SIM MSSV

Associated Lab Samples: 10488632001, 10488632002, 10488632003, 10488632004, 10488632005

METHOD BLANK: 3389301

Matrix: Water

Associated Lab Samples: 10488632001, 10488632002, 10488632003, 10488632004, 10488632005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/L	<0.012	0.042	08/26/19 12:59	
Acenaphthylene	ug/L	<0.0097	0.032	08/26/19 12:59	
Anthracene	ug/L	<0.010	0.034	08/26/19 12:59	
Benzo(a)anthracene	ug/L	<0.0081	0.027	08/26/19 12:59	
Benzo(a)pyrene	ug/L	<0.0057	0.019	08/26/19 12:59	
Benzo(b)fluoranthene	ug/L	<0.0089	0.030	08/26/19 12:59	
Benzo(g,h,i)perylene	ug/L	<0.0096	0.032	08/26/19 12:59	
Benzo(k)fluoranthene	ug/L	<0.0066	0.022	08/26/19 12:59	
Chrysene	ug/L	<0.010	0.035	08/26/19 12:59	
Dibenz(a,h)anthracene	ug/L	<0.0086	0.029	08/26/19 12:59	
Fluoranthene	ug/L	<0.010	0.034	08/26/19 12:59	
Fluorene	ug/L	<0.0054	0.018	08/26/19 12:59	
Indeno(1,2,3-cd)pyrene	ug/L	<0.0055	0.018	08/26/19 12:59	
Naphthalene	ug/L	<0.013	0.043	08/26/19 12:59	
Phenanthrene	ug/L	<0.0070	0.023	08/26/19 12:59	
Pyrene	ug/L	<0.0066	0.022	08/26/19 12:59	
2-Fluorobiphenyl (S)	%	71	47-125	08/26/19 12:59	
p-Terphenyl-d14 (S)	%	82	62-125	08/26/19 12:59	

LABORATORY CONTROL SAMPLE: 3389302

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/L	1	0.79	79	50-125	
Acenaphthylene	ug/L	1	0.80	80	46-125	
Anthracene	ug/L	1	0.76	76	59-125	
Benzo(a)anthracene	ug/L	1	0.76	76	55-125	
Benzo(a)pyrene	ug/L	1	0.85	85	66-125	
Benzo(b)fluoranthene	ug/L	1	0.80	80	64-125	
Benzo(g,h,i)perylene	ug/L	1	0.83	83	58-125	
Benzo(k)fluoranthene	ug/L	1	0.92	92	60-125	
Chrysene	ug/L	1	0.89	89	62-125	
Dibenz(a,h)anthracene	ug/L	1	0.79	79	51-125	
Fluoranthene	ug/L	1	0.82	82	64-125	
Fluorene	ug/L	1	0.83	83	55-125	
Indeno(1,2,3-cd)pyrene	ug/L	1	0.82	82	61-125	
Naphthalene	ug/L	1	0.75	75	48-125	
Phenanthrene	ug/L	1	0.81	81	63-125	
Pyrene	ug/L	1	0.81	81	61-125	
2-Fluorobiphenyl (S)	%			72	47-125	
p-Terphenyl-d14 (S)	%			80	62-125	

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QUALITY CONTROL DATA

Project: 14-1004 Fraser Ship Yard

Pace Project No.: 10488632

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3389304												3389305											
Parameter	Units	10488319003		MS	MSD	MS	MSD	MS	MSD	% Rec	Limits	RPD	Max	RPD	Qual								
		Result	Conc.	Spike	Spike											Result	Result	% Rec	% Rec				
Acenaphthene	ug/L	<0.013	0.98	0.98	0.98	0.67	0.60	68	61	46-125	11	30											
Acenaphthylene	ug/L	<0.0098	0.98	0.98	0.98	0.66	0.61	68	62	48-125	9	30											
Anthracene	ug/L	<0.010	0.98	0.98	0.98	0.69	0.64	70	66	59-125	8	30											
Benzo(a)anthracene	ug/L	0.010J	0.98	0.98	0.98	0.64	0.59	64	60	56-125	7	30											
Benzo(a)pyrene	ug/L	<0.0058	0.98	0.98	0.98	0.73	0.68	74	70	58-125	7	30											
Benzo(b)fluoranthene	ug/L	<0.0090	0.98	0.98	0.98	0.62	0.60	63	61	51-125	4	30											
Benzo(g,h,i)perylene	ug/L	<0.0097	0.98	0.98	0.98	0.71	0.66	73	68	50-125	8	30											
Benzo(k)fluoranthene	ug/L	<0.0067	0.98	0.98	0.98	0.84	0.79	85	81	52-125	6	30											
Chrysene	ug/L	<0.011	0.98	0.98	0.98	0.83	0.77	83	78	58-125	7	30											
Dibenz(a,h)anthracene	ug/L	<0.0087	0.98	0.98	0.98	0.67	0.62	68	63	45-125	8	30											
Fluoranthene	ug/L	<0.010	0.98	0.98	0.98	0.74	0.72	76	74	60-125	4	30											
Fluorene	ug/L	0.0090J	0.98	0.98	0.98	0.76	0.66	76	67	47-125	14	30											
Indeno(1,2,3-cd)pyrene	ug/L	<0.0055	0.98	0.98	0.98	0.67	0.64	69	65	48-125	6	30											
Naphthalene	ug/L	<0.013	0.98	0.98	0.98	0.60	0.56	61	57	38-125	7	30											
Phenanthrene	ug/L	0.014J	0.98	0.98	0.98	0.76	0.71	76	71	60-125	6	30											
Pyrene	ug/L	<0.0067	0.98	0.98	0.98	0.72	0.67	74	69	62-125	7	30											
2-Fluorobiphenyl (S)	%							62	55	47-125													
p-Terphenyl-d14 (S)	%							71	66	62-125													

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3389306												3389307											
Parameter	Units	10488319009		MS	MSD	MS	MSD	MS	MSD	% Rec	Limits	RPD	Max	RPD	Qual								
		Result	Conc.	Spike	Spike											Result	Result	% Rec	% Rec				
Acenaphthene	ug/L	<0.012	0.98	0.97	0.97	0.59	0.62	60	64	46-125	4	30											
Acenaphthylene	ug/L	<0.0093	0.98	0.97	0.97	0.60	0.63	61	65	48-125	4	30											
Anthracene	ug/L	<0.010	0.98	0.97	0.97	0.64	0.66	64	67	59-125	3	30											
Benzo(a)anthracene	ug/L	<0.0079	0.98	0.97	0.97	0.58	0.60	59	62	56-125	4	30											
Benzo(a)pyrene	ug/L	<0.0055	0.98	0.97	0.97	0.65	0.67	66	69	58-125	3	30											
Benzo(b)fluoranthene	ug/L	<0.0086	0.98	0.97	0.97	0.58	0.58	59	60	51-125	1	30											
Benzo(g,h,i)perylene	ug/L	<0.0093	0.98	0.97	0.97	0.63	0.65	64	67	50-125	3	30											
Benzo(k)fluoranthene	ug/L	<0.0064	0.98	0.97	0.97	0.75	0.77	76	80	52-125	3	30											
Chrysene	ug/L	<0.010	0.98	0.97	0.97	0.74	0.77	76	79	58-125	4	30											
Dibenz(a,h)anthracene	ug/L	<0.0083	0.98	0.97	0.97	0.59	0.61	60	63	45-125	4	30											
Fluoranthene	ug/L	<0.010	0.98	0.97	0.97	0.68	0.71	69	73	60-125	4	30											
Fluorene	ug/L	<0.0052	0.98	0.97	0.97	0.68	0.70	69	72	47-125	3	30											
Indeno(1,2,3-cd)pyrene	ug/L	<0.0053	0.98	0.97	0.97	0.61	0.62	62	64	48-125	3	30											
Naphthalene	ug/L	0.51	0.98	0.97	0.97	0.99	1.1	49	57	38-125	8	30											
Phenanthrene	ug/L	0.012J	0.98	0.97	0.97	0.69	0.71	69	72	60-125	2	30											
Pyrene	ug/L	<0.0064	0.98	0.97	0.97	0.68	0.70	68	72	62-125	4	30											
2-Fluorobiphenyl (S)	%							59	62	47-125													
p-Terphenyl-d14 (S)	%							63	68	62-125													

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 14-1004 Fraser Ship Yard

Pace Project No.: 10488632

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 14-1004 Fraser Ship Yard

Pace Project No.: 10488632

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10488632001	PS-MW-4	EPA Mod. 3510C	628177	EPA 8270D by SIM	628465
10488632002	PS-MW-4.1	EPA Mod. 3510C	628177	EPA 8270D by SIM	628465
10488632003	PS-MW-3	EPA Mod. 3510C	628177	EPA 8270D by SIM	628465
10488632004	PS-MW-2	EPA Mod. 3510C	628177	EPA 8270D by SIM	628465
10488632005	PS-MW-1	EPA Mod. 3510C	628177	EPA 8270D by SIM	628465

REPORT OF LABORATORY ANALYSIS

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Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: Environmental Troubleshooters		Report To: John McCarthy		Attention: Same as Report To:	
Address: 3825 Grant Ave Duluth MN 55807		Copy To:		Company Name:	
Email To: Jmccarthy@etsmn.com		Purchase Order No.:		Address:	
Phone: 218-722-6013 Fax:		Project Name: Fraser Shipyard		Pace Quote Reference:	
Requested Due Date/TAT: Standard		Project Number: 14-1004		Pace Project Manager: Shawn Davis	
				REGULATORY AGENCY	
				<input type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER	
				<input type="checkbox"/> UST <input checked="" type="checkbox"/> RCRA <input type="checkbox"/> OTHER	
				Site Location	
				STATE: WI	

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives							Analysis Test	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.																													
					COMPOSITE START	COMPOSITE END/GRAB	DATE	TIME			DATE	TIME	Unpreserved	H2SO4	HNO3	HCl	NaOH					Na2S2O3	Methanol	Other																										
1	SAMPLE ID (A-Z, 0-9 / . -) Sample IDs MUST BE UNIQUE		WT	G	/	8/21	1106	2	2											X	PAM			661																										
2																									PS-MW-4.1	WT	G	/	1105	2	2																	662		
3																									PS-MW-3	WT	G	/	1610	2	2																			663
4																									PS-MW-2	WT	G	/	1502	2	2																			664
5																									PS-MW-1	WT	G	/	1213	2	2																			665
6																																																		
7																																																		
8																																																		
9																																																		
10																																																		
11																																																		
12																																																		

WO#: 10488632
10488632

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAM	JNS
	B. M.	8/22/19	1050	Buermann Madhup	8/22/19	1050	4.2	Y
	RCC pace	8/22/19	1915	DJ - PALE	8/22/19	1915	1.3	Y

ORIGINAL	SAMPLER NAME AND SIGNATURE		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	PRINT Name of SAMPLER:	SIGNATURE of SAMPLER: B. M.				
	DATE Signed (MM/DD/YY): 08/22/19					

	Document Name: Sample Condition Upon Receipt Form	Document Revised: 09May2019 Page 1 of 1
	Document No.: F-MN-L-213-rev.28	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Environmental Project #: _____

WO#: 10488632

Courier: Fed Ex UPS USPS Client
 Pace SpeedDee Commercial See Exception

PM: SRD Due Date: 09/06/19
 CLIENT: ENV TROUBLE

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Biological Tissue Frozen? Yes No N/A

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer: T1(0461) T2(1336) T3(0459)
 T4(0254) T5(0489) Type of Ice: Wet Blue None Dry Melted

Note: Each West Virginia Sample must have temp taken (no temp blanks)

Temp should be above freezing to 6°C	Cooler Temp Read w/temp blank: <u>1.2</u> °C	Average Corrected Temp (no temp blank only): <input type="checkbox"/>
Correction Factor: <u>1.01</u>	Cooler Temp Corrected w/temp blank: <u>1.3</u> °C	See Exceptions <input type="checkbox"/>

USDA Regulated Soil: (N/A, water sample/Other: _____) Date/Initials of Person Examining Contents: 8/22/19 JS
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present and Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E coli <input type="checkbox"/> BOD/cBOD <input type="checkbox"/> Hex Chrome <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Field Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is sufficient information available to reconcile the samples to the COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. If no, write ID/ Date/Time on Container Below: <input type="checkbox"/> See Exception
Matrix: <input checked="" type="checkbox"/> Water <input type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/> NaOH <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Positive for Res. Chlorine? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> See Exception pH Paper Lot# <input type="checkbox"/>
	Res. Chlorine 0-6 Roll 0-6 Strip 0-14 Strip
Headspace in VOA Vials (greater than 6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> See Exception
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Pace Trip Blank Lot # (if purchased): _____

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: Sharon Davis Date: 8/23/19

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: 103