

Jorgensen, Theadora O - DNR

From: Adam Roder, P.E. <aroder@thesigmagroup.com>
Sent: Friday, May 25, 2018 10:17 AM
To: Ryan, Nancy D - DNR
Subject: RE: 0241581016_MSOE Diercks Computational Science Hall
Attachments: 17076 Fig 1 GW Flow Map.pdf; 17076 GW Data Table.pdf; 17076 Fig 2 GW Qual Map.pdf; 2018.5.24 Lab Rpt GW Synergy 17076.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Good morning Nancy,

We conducted the 2nd groundwater sampling event on May 14th in anticipation of the construction beginning on Wed. May 16th. The start date got pushed back to Wed. May 23rd, and now the start date is still delayed as the construction manager is waiting on a couple City of Milwaukee permits...so no NR 718 soil hauling this week, but hopefully next week. In the meantime, this has allowed us to receive and review the latest groundwater lab data.

In short, the groundwater results were similar to the 1st sampling event:

- Water elevations indicate groundwater flows southeast across the southeastern portion of the site, and possibly to the west (with a very shallow gradient) across the northwestern portion of the site. A current groundwater flow map is attached.
- Groundwater data are summarized in the attached data table and groundwater quality map (lab report also attached for reference):
 - o VOCs reported below detection limits in wells MW-1 (PCE PAL exceedance from 1st sampling event was not duplicated), MW-2, and MW-3. VOCs reported below detection limits in well MW-4, except for an estimated concentration of chloroform. VOCs reported below detection limits in well MW-5, except for an estimated concentration of bromodichloromethane (not a ES exceedance per NR 140.1(3)(c)), chloroform (confirmed to be above its PAL, but below its ES), and an estimated concentration of dibromochloromethane (only in the duplicate sample). So no ES exceedances, and only the chloroform above its PAL in well MW-5.
 - o PAHs – nearly all reported below the laboratory detection limits. Each well had 1 to 2 compounds with estimated concentrations. No PAL exceedances.
 - o Dissolved RCRA metals – nearly all reported below the laboratory detection limits, a few background-level type detections. No PAL exceedances.

Based on the results, we recommend that monitoring wells MW-1 through MW-5 be abandoned in accordance with NR 141 regulations before construction begins at the site. We request a brief email concurrence that no further groundwater monitoring is needed and that the wells may be abandoned. Let me know if you have any questions or want to talk more.

Thank you, and have a great Memorial Day weekend,

Adam

From: Adam Roder, P.E.
Sent: Thursday, April 12, 2018 10:49 AM
To: Ryan, Nancy D - DNR <Nancy.Ryan@wisconsin.gov>
Subject: 0241581016_MSOE Diercks Computational Science Hall

Hi Nancy,

Thanks for the conversations yesterday and this morning – it’s always nice to talk through questions and comments on report submittals.

To clarify a bit more on the groundwater monitoring, we are planning for a 2nd sampling event in late May / early June (as close to 3 months after the 1st sampling event [3/5/18] as possible, but before construction commences). All five wells will be sampled for VOCs, PAHs, and dissolved RCRA metals. The hope is that this 2nd event will confirm the initial results of very limited VOC impacts (all non-detect, except for the PAL exceedance for PCE in MW-1 and PAL exceedance for chloroform in MW-5), non-detect / less than PALs for PAHs, and non-detect / less than PALs for RCRA metals. Assuming the results are consistent, we’d recommend that the monitoring wells be abandoned.

If some results come back higher for the 2nd event, we’ll make decisions based on which wells show these impacts. Wells MW-3 and MW-1 will likely need to be abandoned as construction starts due to their locations within the building footprint. Wells MW-2, MW-4, and MW-5 outside the building perimeter would hopefully be able to be saved, at least for maybe another few additional months to get in a 3rd event if needed. The goal of any additional sampling beyond the 2nd event (hopefully nothing beyond 4 quarters of monitoring would be needed), would be to prove stable or decreasing concentration trends over time. The need for any replacement wells will be evaluated on a case-by-case basis after the 2nd sampling event.

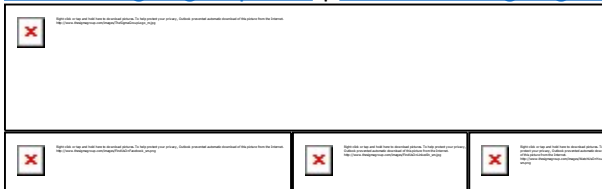
Based on the results of the 1st round of data, and the lack of apparent point source contamination areas, we are hopeful that the 2nd sampling event will be sufficient. We will share the 2nd round of groundwater data with you via email as soon as it is available and provide recommendations.

Please let me know if you need more information about the sampling plan.

Thanks,

Adam

Adam Roder, P.E.
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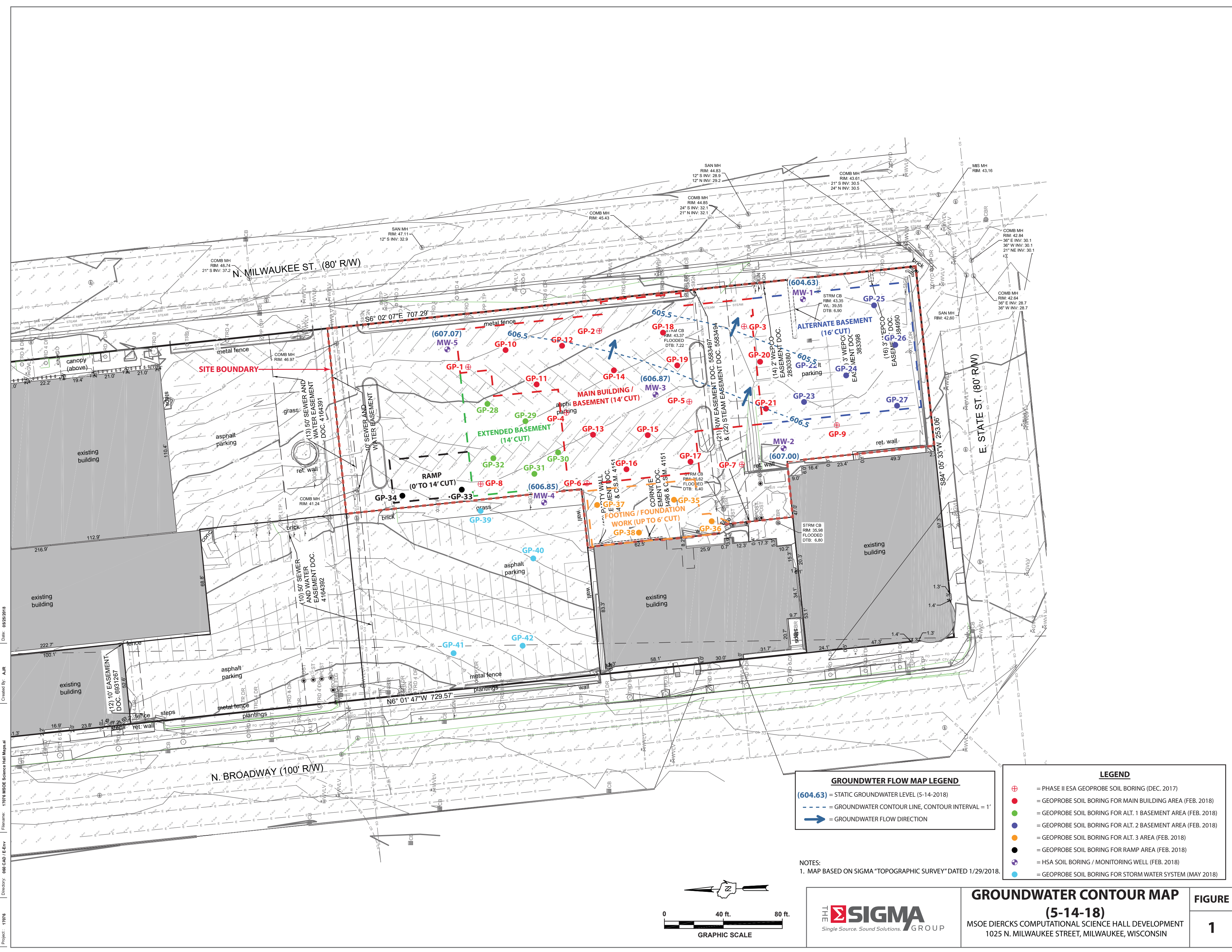
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Table 4
Groundwater Analytical Results
Diercks Computational Science Hall - 1025 N. Milwaukee Street, Milwaukee, Wisconsin
Sigma Project No. 17076

Well Location:		MW-1		MW-2		MW-3		MW-4			MW-5			NR 140 ES	NR 140 PAL
Date:		3/5/18	5/14/18	3/5/18	5/14/18	3/5/18	5/14/18	3/5/18	3/18 Dup	5/14/18	3/5/18	5/14/18	5/18 Dup		
Water Elevation* (feet MSL):		603.89	604.63	606.76	607.00	606.66	606.87	606.63	---	606.85	606.89	607.07	---		
Detected VOCs															
Bromodichloromethane	µg/L	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	0.86 J *	0.87 J	0.6	0.06
Chloroform	µg/L	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	0.52 J	0.83	1.94	1.84	6	6
Dibromochloromethane	µg/L	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	0.22 J	60	6
Tetrachloroethene	µg/L	1.93	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	5	0.5
PAHs															
Acenaphthene	µg/L	<0.008	<0.008	<0.008	0.0111 J	<0.008	0.0105 J	<0.008	NA	<0.008	<0.008	0.0101 J	NA	NS	NS
Acenaphthylene	µg/L	<0.009	0.0147 J	<0.009	0.009 J	<0.009	0.02 J	0.037	NA	0.0107 J	<0.009	<0.009	NA	NS	NS
Anthracene	µg/L	<0.009	<0.009	0.0095 J	<0.009	<0.009	<0.009	<0.009	NA	<0.009	<0.009	<0.009	NA	3,000	600
Benzo(a)anthracene	µg/L	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	NA	<0.017	<0.017	<0.017	NA	NS	NS
Benzo(a)pyrene	µg/L	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	NA	<0.017	<0.017	<0.017	NA	0.2	0.02
Benzo(b)fluoranthene	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	NA	<0.02	<0.02	<0.02	NA	0.2	0.02
Benzo(ghi)perylene	µg/L	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	NA	<0.011	<0.011	<0.011	NA	NS	NS
Benzo(k)fluoranthene	µg/L	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	NA	<0.014	<0.014	<0.014	NA	NS	NS
Chrysene	µg/L	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	NA	<0.019	<0.019	<0.019	NA	0.2	0.02
Dibenzo(a,h)anthracene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA	<0.01	<0.01	<0.01	NA	NS	NS
Fluoranthene	µg/L	<0.031	<0.031	<0.031	<0.031	<0.031	<0.031	<0.031	NA	<0.031	<0.031	<0.031	NA	400	80
Fluorene	µg/L	0.0114 J	<0.011	<0.011	<0.011	<0.011	<0.011	0.0131 J	NA	<0.011	<0.011	<0.011	NA	400	80
Indeno(1,2,3-cd)pyrene	µg/L	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	NA	<0.012	<0.012	<0.012	NA	NS	NS
1-Methylnaphthalene	µg/L	<0.0239	<0.0239	<0.0239	<0.0239	<0.0239	<0.0239	<0.0239	NA	<0.0239	<0.0239	<0.0239	NA	NS	NS
2-Methylnaphthalene	µg/L	0.044 J	<0.0236	<0.0236	<0.0236	<0.0236	<0.0236	<0.0236	NA	<0.0236	<0.0236	<0.0236	NA	NS	NS
Naphthalene	µg/L	0.043 J	<0.023	0.066 J	<0.023	0.057 J	<0.023	0.047 J	NA	<0.023	0.054 J	<0.023	NA	100	10
Phenanthrene	µg/L	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	NA	<0.025	<0.025	<0.025	NA	NS	NS
Pyrene	µg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	NA	<0.03	<0.03	<0.03	NA	250	50
Dissolved RCRA Metals															
Arsenic	µg/L	<1.4	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	NA	<0.7	<0.7	<0.7	NA	10	1
Barium	µg/L	244	163	103	54.7	245	94.3	28.1	NA	37.0	47.1	27.0	NA	2,000	400
Cadmium	µg/L	<0.4	<0.4	0.43 J	<0.4	<0.4	<0.4	<0.4	NA	<0.4	<0.4	<0.4	NA	5	0.5
Chromium	µg/L	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	NA	<3.9	<3.9	<3.9	NA	100	10
Lead	µg/L	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	NA	<0.9	<0.9	<0.9	NA	15	1.5
Mercury	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA	2	0.2
Selenium	µg/L	6.7	4.8	1.2 J	<1	1.8 J	<1	<1	NA	<1	<1	<1	NA	50	10
Silver	µg/L	<8.4	<8.4	<8.4	<8.4	<8.4	<8.4	<8.4	NA	<8.4	<8.4	<8.4	NA	50	10

Notes:

- NR 140 ES = Wisconsin Administrative Code, Chapter NR 140 Enforcement Standard
- NR 140 PAL = Wisconsin Administrative Code, Chapter NR 140 Preventive Action Limit
- NS = no standard
- µg/L = micrograms per liter (equivalent to parts per billion, ppb)
- NA = Not Analyzed
- Laboratory flags: "J" = Analyte detected between Limit of Detection and Limit of Quantitation.
- Trip blank results: 3/5/18: All VOCs reported below laboratory detection limits.
5/14/18: All VOCs reported below laboratory detection limits.
- Equipment blank result: 3/5/18: All VOCs reported below laboratory detection limits.
5/14/18: All VOCs reported below laboratory detection limits.
- Exceedances: **BOLD** = Concentration exceeds NR 140 ES
ITALICS = Concentration exceeds NR 140 PAL
- Special notes: * = not an NR 140 ES or PAL exceedance per NR 140.14(3)(c)



Project: 17076 | Directory: 600 CAD / E-Env | Filename: 17076 MSOE Science Hall Maps.dwg | Created By: A.R. | Date: 02/25/2018

GROUNDWATER FLOW MAP LEGEND

(604.63) = STATIC GROUNDWATER LEVEL (5-14-2018)

--- = GROUNDWATER CONTOUR LINE, CONTOUR INTERVAL = 1'

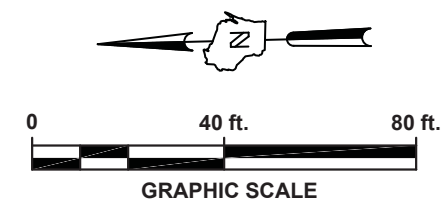
→ = GROUNDWATER FLOW DIRECTION

NOTES:

1. MAP BASED ON SIGMA "TOPOGRAPHIC SURVEY" DATED 1/29/2018.

LEGEND

- ⊕ = PHASE II ESA GEOPROBE SOIL BORING (DEC. 2017)
- = GEOPROBE SOIL BORING FOR MAIN BUILDING AREA (FEB. 2018)
- = GEOPROBE SOIL BORING FOR ALT. 1 BASEMENT AREA (FEB. 2018)
- = GEOPROBE SOIL BORING FOR ALT. 2 BASEMENT AREA (FEB. 2018)
- = GEOPROBE SOIL BORING FOR ALT. 3 AREA (FEB. 2018)
- = GEOPROBE SOIL BORING FOR RAMP AREA (FEB. 2018)
- ⊕ = HSA SOIL BORING / MONITORING WELL (FEB. 2018)
- = GEOPROBE SOIL BORING FOR STORM WATER SYSTEM (MAY 2018)

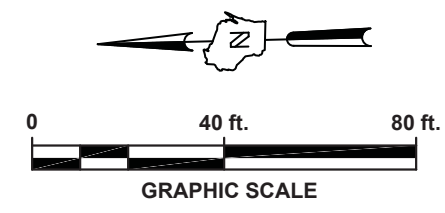


GROUNDWATER CONTOUR MAP
(5-14-18)
 MSOE DIERCKS COMPUTATIONAL SCIENCE HALL DEVELOPMENT
 1025 N. MILWAUKEE STREET, MILWAUKEE, WISCONSIN

FIGURE
1



Project: 17076
Directory: 686 CAD / E-Env
Filename: 17076 MSOE Science Hall Maps.dwg
Created By: A.R.
Date: 02/25/2018



GROUNDWATER QUALITY MAP
MSOE DIERCKS COMPUTATIONAL SCIENCE HALL DEVELOPMENT
1025 N. MILWAUKEE STREET, MILWAUKEE, WISCONSIN

FIGURE
2

Synergy Environmental Lab, INC.

1990 Prospect Ct., Appleton, WI 54914 *P 920-830-2455 * F 920-733-0631

ADAM RODER
THE SIGMA GROUP, INC.
1300 W. CANAL STREET
MILWAUKEE, WI 53233

Report Date 24-May-18

Project Name MSOE
Project # 17076-005

Invoice # E34634

Lab Code 5034634A
Sample ID MW-1
Sample Matrix Water
Sample Date 5/14/2018

	Result	Unit	LOD	LOQ	Dil	Method	Ext Date	Run Date	Analyst	Code
Inorganic										
Metals										
Arsenic, Dissolved	< 0.7	ug/L	0.7	2.3	1	7060A	5/16/2018	5/23/2018	CWT	1
Barium, Dissolved	163	ug/L	1.7	5.5	1	200.7	5/23/2018	5/23/2018	CWT	1
Cadmium, Dissolved	< 0.4	ug/L	0.4	1.3	1	200.7	5/23/2018	5/23/2018	CWT	1
Chromium, Dissolved	< 3.9	ug/L	3.9	12.8	1	200.7	5/23/2018	5/23/2018	CWT	1
Lead, Dissolved	< 0.9	ug/L	0.9	3	1	7421	5/17/2018	5/17/2018	CWT	1
Mercury, Dissolved	< 0.1	ug/L	0.1	0.34	1	245.1	5/17/2018	5/17/2018	CWT	1
Selenium, Dissolved	4.8	ug/L	1	3.3	1	7740	5/24/2018	5/24/2018	CWT	1 45
Silver, Dissolved	< 8.4	ug/L	8.4	28	1	200.7	5/23/2018	5/23/2018	CWT	1
Organic										
PAH SIM										
Acenaphthene	< 0.008	ug/l	0.008	0.025	1	M8270C	5/21/2018	5/22/2018	NJC	1
Acenaphthylene	0.0147 "J"	ug/l	0.009	0.028	1	M8270C	5/21/2018	5/22/2018	NJC	1
Anthracene	< 0.009	ug/l	0.009	0.03	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(a)anthracene	< 0.017	ug/l	0.017	0.054	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(a)pyrene	< 0.017	ug/l	0.017	0.055	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(b)fluoranthene	< 0.02	ug/l	0.02	0.063	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(g,h,i)perylene	< 0.011	ug/l	0.011	0.036	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(k)fluoranthene	< 0.014	ug/l	0.014	0.044	1	M8270C	5/21/2018	5/22/2018	NJC	1
Chrysene	< 0.019	ug/l	0.019	0.062	1	M8270C	5/21/2018	5/22/2018	NJC	1
Dibenzo(a,h)anthracene	< 0.01	ug/l	0.01	0.031	1	M8270C	5/21/2018	5/22/2018	NJC	1
Fluoranthene	< 0.031	ug/l	0.031	0.098	1	M8270C	5/21/2018	5/22/2018	NJC	1
Fluorene	< 0.011	ug/l	0.011	0.034	1	M8270C	5/21/2018	5/22/2018	NJC	1
Indeno(1,2,3-cd)pyrene	< 0.012	ug/l	0.012	0.038	1	M8270C	5/21/2018	5/22/2018	NJC	1
1-Methyl naphthalene	< 0.0239	ug/l	0.0239	0.076	1	M8270C	5/21/2018	5/22/2018	NJC	1
2-Methyl naphthalene	< 0.0236	ug/l	0.0236	0.0751	1	M8270C	5/21/2018	5/22/2018	NJC	1
Naphthalene	< 0.023	ug/l	0.023	0.073	1	M8270C	5/21/2018	5/22/2018	NJC	1
Phenanthrene	< 0.025	ug/l	0.025	0.081	1	M8270C	5/21/2018	5/22/2018	NJC	1
Pyrene	< 0.03	ug/l	0.03	0.095	1	M8270C	5/21/2018	5/22/2018	NJC	1

Project Name MSOE
Project # 17076-005

Invoice # E34634

Lab Code 5034634A
Sample ID MW-1
Sample Matrix Water
Sample Date 5/14/2018

	Result	Unit	LOD	LOQ	Dil	Method	Ext Date	Run Date	Analyst	Code
VOC's										
Benzene	< 0.22	ug/l	0.22	0.71	1	8260B		5/16/2018	MJR	1
Bromobenzene	< 0.44	ug/l	0.44	1.38	1	8260B		5/16/2018	MJR	1
Bromodichloromethane	< 0.33	ug/l	0.33	1.06	1	8260B		5/16/2018	MJR	1
Bromoform	< 0.45	ug/l	0.45	1.44	1	8260B		5/16/2018	MJR	1
tert-Butylbenzene	< 0.25	ug/l	0.25	0.8	1	8260B		5/16/2018	MJR	1
sec-Butylbenzene	< 0.79	ug/l	0.79	2.53	1	8260B		5/16/2018	MJR	1
n-Butylbenzene	< 0.71	ug/l	0.71	2.25	1	8260B		5/16/2018	MJR	1
Carbon Tetrachloride	< 0.31	ug/l	0.31	0.98	1	8260B		5/16/2018	MJR	1
Chlorobenzene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
Chloroethane	< 0.61	ug/l	0.61	1.95	1	8260B		5/16/2018	MJR	1
Chloroform	< 0.26	ug/l	0.26	0.82	1	8260B		5/16/2018	MJR	1
Chloromethane	< 0.54	ug/l	0.54	1.72	1	8260B		5/16/2018	MJR	1
2-Chlorotoluene	< 0.31	ug/l	0.31	0.98	1	8260B		5/16/2018	MJR	1
4-Chlorotoluene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
1,2-Dibromo-3-chloropropane	< 2.96	ug/l	2.96	9.43	1	8260B		5/16/2018	MJR	1
Dibromochloromethane	< 0.22	ug/l	0.22	0.69	1	8260B		5/16/2018	MJR	1
1,4-Dichlorobenzene	< 0.7	ug/l	0.7	2.22	1	8260B		5/16/2018	MJR	1
1,3-Dichlorobenzene	< 0.85	ug/l	0.85	2.7	1	8260B		5/16/2018	MJR	1
1,2-Dichlorobenzene	< 0.86	ug/l	0.86	2.74	1	8260B		5/16/2018	MJR	1
Dichlorodifluoromethane	< 0.32	ug/l	0.32	1.02	1	8260B		5/16/2018	MJR	1
1,2-Dichloroethane	< 0.25	ug/l	0.25	0.78	1	8260B		5/16/2018	MJR	1
1,1-Dichloroethane	< 0.36	ug/l	0.36	1.14	1	8260B		5/16/2018	MJR	1
1,1-Dichloroethene	< 0.42	ug/l	0.42	1.34	1	8260B		5/16/2018	MJR	1
cis-1,2-Dichloroethene	< 0.37	ug/l	0.37	1.16	1	8260B		5/16/2018	MJR	1
trans-1,2-Dichloroethene	< 0.34	ug/l	0.34	1.07	1	8260B		5/16/2018	MJR	1
1,2-Dichloropropane	< 0.44	ug/l	0.44	1.39	1	8260B		5/16/2018	MJR	1
1,3-Dichloropropane	< 0.3	ug/l	0.3	0.94	1	8260B		5/16/2018	MJR	1
trans-1,3-Dichloropropene	< 0.32	ug/l	0.32	1.01	1	8260B		5/16/2018	MJR	1
cis-1,3-Dichloropropene	< 0.26	ug/l	0.26	0.81	1	8260B		5/16/2018	MJR	1
Di-isopropyl ether	< 0.21	ug/l	0.21	0.66	1	8260B		5/16/2018	MJR	1
EDB (1,2-Dibromoethane)	< 0.34	ug/l	0.34	1.09	1	8260B		5/16/2018	MJR	1
Ethylbenzene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
Hexachlorobutadiene	< 1.34	ug/l	1.34	4.28	1	8260B		5/16/2018	MJR	1
Isopropylbenzene	< 0.78	ug/l	0.78	2.47	1	8260B		5/16/2018	MJR	1
p-Isopropyltoluene	< 0.24	ug/l	0.24	0.76	1	8260B		5/16/2018	MJR	1
Methylene chloride	< 1.32	ug/l	1.32	4.21	1	8260B		5/16/2018	MJR	1
Methyl tert-butyl ether (MTBE)	< 0.28	ug/l	0.28	0.89	1	8260B		5/16/2018	MJR	1
Naphthalene	< 2.1	ug/l	2.1	6.65	1	8260B		5/16/2018	MJR	1
n-Propylbenzene	< 0.61	ug/l	0.61	1.95	1	8260B		5/16/2018	MJR	1
1,1,2,2-Tetrachloroethane	< 0.3	ug/l	0.3	0.97	1	8260B		5/16/2018	MJR	1
1,1,1,2-Tetrachloroethane	< 0.35	ug/l	0.35	1.13	1	8260B		5/16/2018	MJR	1
Tetrachloroethene	< 0.38	ug/l	0.38	1.21	1	8260B		5/16/2018	MJR	1
Toluene	< 0.19	ug/l	0.19	0.6	1	8260B		5/16/2018	MJR	1
1,2,4-Trichlorobenzene	< 1.15	ug/l	1.15	3.67	1	8260B		5/16/2018	MJR	1
1,2,3-Trichlorobenzene	< 1.71	ug/l	1.71	5.43	1	8260B		5/16/2018	MJR	1
1,1,1-Trichloroethane	< 0.33	ug/l	0.33	1.05	1	8260B		5/16/2018	MJR	1
1,1,2-Trichloroethane	< 0.42	ug/l	0.42	1.32	1	8260B		5/16/2018	MJR	1
Trichloroethene (TCE)	< 0.3	ug/l	0.3	0.94	1	8260B		5/16/2018	MJR	1
Trichlorofluoromethane	< 0.35	ug/l	0.35	1.1	1	8260B		5/16/2018	MJR	1
1,2,4-Trimethylbenzene	< 0.8	ug/l	0.8	2.55	1	8260B		5/16/2018	MJR	1
1,3,5-Trimethylbenzene	< 0.63	ug/l	0.63	2	1	8260B		5/16/2018	MJR	1

Project Name MSOE
Project # 17076-005

Invoice # E34634

Lab Code 5034634A
Sample ID MW-1
Sample Matrix Water
Sample Date 5/14/2018

	Result	Unit	LOD	LOQ	Dil	Method	Ext Date	Run Date	Analyst	Code
Vinyl Chloride	< 0.2	ug/l	0.2	0.65	1	8260B		5/16/2018	MJR	1
m&p-Xylene	< 0.43	ug/l	0.43	1.38	1	8260B		5/16/2018	MJR	1
o-Xylene	< 0.29	ug/l	0.29	0.93	1	8260B		5/16/2018	MJR	1
SUR - 1,2-Dichloroethane-d4	93	REC %			1	8260B		5/16/2018	MJR	1
SUR - 4-Bromofluorobenzene	91	REC %			1	8260B		5/16/2018	MJR	1
SUR - Dibromofluoromethane	104	REC %			1	8260B		5/16/2018	MJR	1
SUR - Toluene-d8	88	REC %			1	8260B		5/16/2018	MJR	1

Project Name MSOE
 Project # 17076-005

Invoice # E34634

Lab Code 5034634B
 Sample ID MW-2
 Sample Matrix Water
 Sample Date 5/14/2018

	Result	Unit	LOD	LOQ	Dil	Method	Ext Date	Run Date	Analyst	Code
Inorganic										
Metals										
Arsenic, Dissolved	< 0.7	ug/L	0.7	2.3	1	7060A		5/16/2018	CWT	1
Barium, Dissolved	54.7	ug/L	1.7	5.5	1	200.7		5/23/2018	CWT	1
Cadmium, Dissolved	< 0.4	ug/L	0.4	1.3	1	200.7		5/23/2018	CWT	1
Chromium, Dissolved	< 3.9	ug/L	3.9	12.8	1	200.7		5/23/2018	CWT	1
Lead, Dissolved	< 0.9	ug/L	0.9	3	1	7421		5/17/2018	CWT	1
Mercury, Dissolved	< 0.1	ug/L	0.1	0.34	1	245.1		5/17/2018	CWT	1
Selenium, Dissolved	< 1	ug/L	1	3.3	1	7740		5/24/2018	CWT	1
Silver, Dissolved	< 8.4	ug/L	8.4	28	1	200.7		5/23/2018	CWT	1
Organic										
PAH SIM										
Acenaphthene	0.0111 "J"	ug/l	0.008	0.025	1	M8270C	5/21/2018	5/22/2018	NJC	1
Acenaphthylene	0.009 "J"	ug/l	0.009	0.028	1	M8270C	5/21/2018	5/22/2018	NJC	1
Anthracene	< 0.009	ug/l	0.009	0.03	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(a)anthracene	< 0.017	ug/l	0.017	0.054	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(a)pyrene	< 0.017	ug/l	0.017	0.055	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(b)fluoranthene	< 0.02	ug/l	0.02	0.063	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(g,h,i)perylene	< 0.011	ug/l	0.011	0.036	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(k)fluoranthene	< 0.014	ug/l	0.014	0.044	1	M8270C	5/21/2018	5/22/2018	NJC	1
Chrysene	< 0.019	ug/l	0.019	0.062	1	M8270C	5/21/2018	5/22/2018	NJC	1
Dibenzo(a,h)anthracene	< 0.01	ug/l	0.01	0.031	1	M8270C	5/21/2018	5/22/2018	NJC	1
Fluoranthene	< 0.031	ug/l	0.031	0.098	1	M8270C	5/21/2018	5/22/2018	NJC	1
Fluorene	< 0.011	ug/l	0.011	0.034	1	M8270C	5/21/2018	5/22/2018	NJC	1
Indeno(1,2,3-cd)pyrene	< 0.012	ug/l	0.012	0.038	1	M8270C	5/21/2018	5/22/2018	NJC	1
1-Methyl naphthalene	< 0.0239	ug/l	0.0239	0.076	1	M8270C	5/21/2018	5/22/2018	NJC	1
2-Methyl naphthalene	< 0.0236	ug/l	0.0236	0.0751	1	M8270C	5/21/2018	5/22/2018	NJC	1
Naphthalene	< 0.023	ug/l	0.023	0.073	1	M8270C	5/21/2018	5/22/2018	NJC	1
Phenanthrene	< 0.025	ug/l	0.025	0.081	1	M8270C	5/21/2018	5/22/2018	NJC	1
Pyrene	< 0.03	ug/l	0.03	0.095	1	M8270C	5/21/2018	5/22/2018	NJC	1
VOC's										
Benzene	< 0.22	ug/l	0.22	0.71	1	8260B		5/16/2018	MJR	1
Bromobenzene	< 0.44	ug/l	0.44	1.38	1	8260B		5/16/2018	MJR	1
Bromodichloromethane	< 0.33	ug/l	0.33	1.06	1	8260B		5/16/2018	MJR	1
Bromoform	< 0.45	ug/l	0.45	1.44	1	8260B		5/16/2018	MJR	1
tert-Butylbenzene	< 0.25	ug/l	0.25	0.8	1	8260B		5/16/2018	MJR	1
sec-Butylbenzene	< 0.79	ug/l	0.79	2.53	1	8260B		5/16/2018	MJR	1
n-Butylbenzene	< 0.71	ug/l	0.71	2.25	1	8260B		5/16/2018	MJR	1
Carbon Tetrachloride	< 0.31	ug/l	0.31	0.98	1	8260B		5/16/2018	MJR	1
Chlorobenzene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
Chloroethane	< 0.61	ug/l	0.61	1.95	1	8260B		5/16/2018	MJR	1
Chloroform	< 0.26	ug/l	0.26	0.82	1	8260B		5/16/2018	MJR	1
Chloromethane	< 0.54	ug/l	0.54	1.72	1	8260B		5/16/2018	MJR	1
2-Chlorotoluene	< 0.31	ug/l	0.31	0.98	1	8260B		5/16/2018	MJR	1
4-Chlorotoluene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
1,2-Dibromo-3-chloropropane	< 2.96	ug/l	2.96	9.43	1	8260B		5/16/2018	MJR	1
Dibromochloromethane	< 0.22	ug/l	0.22	0.69	1	8260B		5/16/2018	MJR	1
1,4-Dichlorobenzene	< 0.7	ug/l	0.7	2.22	1	8260B		5/16/2018	MJR	1
1,3-Dichlorobenzene	< 0.85	ug/l	0.85	2.7	1	8260B		5/16/2018	MJR	1
1,2-Dichlorobenzene	< 0.86	ug/l	0.86	2.74	1	8260B		5/16/2018	MJR	1
Dichlorodifluoromethane	< 0.32	ug/l	0.32	1.02	1	8260B		5/16/2018	MJR	1

Project Name MSOE
 Project # 17076-005

Invoice # E34634

Lab Code 5034634B
 Sample ID MW-2
 Sample Matrix Water
 Sample Date 5/14/2018

	Result	Unit	LOD	LOQ	Dil	Method	Ext Date	Run Date	Analyst	Code
1,2-Dichloroethane	< 0.25	ug/l	0.25	0.78	1	8260B		5/16/2018	MJR	1
1,1-Dichloroethane	< 0.36	ug/l	0.36	1.14	1	8260B		5/16/2018	MJR	1
1,1-Dichloroethene	< 0.42	ug/l	0.42	1.34	1	8260B		5/16/2018	MJR	1
cis-1,2-Dichloroethene	< 0.37	ug/l	0.37	1.16	1	8260B		5/16/2018	MJR	1
trans-1,2-Dichloroethene	< 0.34	ug/l	0.34	1.07	1	8260B		5/16/2018	MJR	1
1,2-Dichloropropane	< 0.44	ug/l	0.44	1.39	1	8260B		5/16/2018	MJR	1
1,3-Dichloropropane	< 0.3	ug/l	0.3	0.94	1	8260B		5/16/2018	MJR	1
trans-1,3-Dichloropropene	< 0.32	ug/l	0.32	1.01	1	8260B		5/16/2018	MJR	1
cis-1,3-Dichloropropene	< 0.26	ug/l	0.26	0.81	1	8260B		5/16/2018	MJR	1
Di-isopropyl ether	< 0.21	ug/l	0.21	0.66	1	8260B		5/16/2018	MJR	1
EDB (1,2-Dibromoethane)	< 0.34	ug/l	0.34	1.09	1	8260B		5/16/2018	MJR	1
Ethylbenzene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
Hexachlorobutadiene	< 1.34	ug/l	1.34	4.28	1	8260B		5/16/2018	MJR	1
Isopropylbenzene	< 0.78	ug/l	0.78	2.47	1	8260B		5/16/2018	MJR	1
p-Isopropyltoluene	< 0.24	ug/l	0.24	0.76	1	8260B		5/16/2018	MJR	1
Methylene chloride	< 1.32	ug/l	1.32	4.21	1	8260B		5/16/2018	MJR	1
Methyl tert-butyl ether (MTBE)	< 0.28	ug/l	0.28	0.89	1	8260B		5/16/2018	MJR	1
Naphthalene	< 2.1	ug/l	2.1	6.65	1	8260B		5/16/2018	MJR	1
n-Propylbenzene	< 0.61	ug/l	0.61	1.95	1	8260B		5/16/2018	MJR	1
1,1,2,2-Tetrachloroethane	< 0.3	ug/l	0.3	0.97	1	8260B		5/16/2018	MJR	1
1,1,1,2-Tetrachloroethane	< 0.35	ug/l	0.35	1.13	1	8260B		5/16/2018	MJR	1
Tetrachloroethene	< 0.38	ug/l	0.38	1.21	1	8260B		5/16/2018	MJR	1
Toluene	< 0.19	ug/l	0.19	0.6	1	8260B		5/16/2018	MJR	1
1,2,4-Trichlorobenzene	< 1.15	ug/l	1.15	3.67	1	8260B		5/16/2018	MJR	1
1,2,3-Trichlorobenzene	< 1.71	ug/l	1.71	5.43	1	8260B		5/16/2018	MJR	1
1,1,1-Trichloroethane	< 0.33	ug/l	0.33	1.05	1	8260B		5/16/2018	MJR	1
1,1,2-Trichloroethane	< 0.42	ug/l	0.42	1.32	1	8260B		5/16/2018	MJR	1
Trichloroethene (TCE)	< 0.3	ug/l	0.3	0.94	1	8260B		5/16/2018	MJR	1
Trichlorofluoromethane	< 0.35	ug/l	0.35	1.1	1	8260B		5/16/2018	MJR	1
1,2,4-Trimethylbenzene	< 0.8	ug/l	0.8	2.55	1	8260B		5/16/2018	MJR	1
1,3,5-Trimethylbenzene	< 0.63	ug/l	0.63	2	1	8260B		5/16/2018	MJR	1
Vinyl Chloride	< 0.2	ug/l	0.2	0.65	1	8260B		5/16/2018	MJR	1
m&p-Xylene	< 0.43	ug/l	0.43	1.38	1	8260B		5/16/2018	MJR	1
o-Xylene	< 0.29	ug/l	0.29	0.93	1	8260B		5/16/2018	MJR	1
SUR - Toluene-d8	88	REC %			1	8260B		5/16/2018	MJR	1
SUR - Dibromofluoromethane	110	REC %			1	8260B		5/16/2018	MJR	1
SUR - 1,2-Dichloroethane-d4	106	REC %			1	8260B		5/16/2018	MJR	1
SUR - 4-Bromofluorobenzene	90	REC %			1	8260B		5/16/2018	MJR	1

Project Name MSOE
 Project # 17076-005

Invoice # E34634

Lab Code 5034634C
 Sample ID MW-3
 Sample Matrix Water
 Sample Date 5/14/2018

	Result	Unit	LOD	LOQ	Dil	Method	Ext Date	Run Date	Analyst	Code
Inorganic										
Metals										
Arsenic, Dissolved	< 0.7	ug/L	0.7	2.3	1	7060A		5/16/2018	CWT	1
Barium, Dissolved	94.3	ug/L	1.7	5.5	1	200.7		5/23/2018	CWT	1
Cadmium, Dissolved	< 0.4	ug/L	0.4	1.3	1	200.7		5/23/2018	CWT	1
Chromium, Dissolved	< 3.9	ug/L	3.9	12.8	1	200.7		5/23/2018	CWT	1
Lead, Dissolved	< 0.9	ug/L	0.9	3	1	7421		5/17/2018	CWT	1
Mercury, Dissolved	< 0.1	ug/L	0.1	0.34	1	245.1		5/17/2018	CWT	1
Selenium, Dissolved	< 1	ug/L	1	3.3	1	7740		5/24/2018	CWT	1
Silver, Dissolved	< 8.4	ug/L	8.4	28	1	200.7		5/23/2018	CWT	1
Organic										
PAH SIM										
Acenaphthene	0.0105 "J"	ug/l	0.008	0.025	1	M8270C	5/21/2018	5/22/2018	NJC	1
Acenaphthylene	0.02 "J"	ug/l	0.009	0.028	1	M8270C	5/21/2018	5/22/2018	NJC	1
Anthracene	< 0.009	ug/l	0.009	0.03	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(a)anthracene	< 0.017	ug/l	0.017	0.054	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(a)pyrene	< 0.017	ug/l	0.017	0.055	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(b)fluoranthene	< 0.02	ug/l	0.02	0.063	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(g,h,i)perylene	< 0.011	ug/l	0.011	0.036	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(k)fluoranthene	< 0.014	ug/l	0.014	0.044	1	M8270C	5/21/2018	5/22/2018	NJC	1
Chrysene	< 0.019	ug/l	0.019	0.062	1	M8270C	5/21/2018	5/22/2018	NJC	1
Dibenzo(a,h)anthracene	< 0.01	ug/l	0.01	0.031	1	M8270C	5/21/2018	5/22/2018	NJC	1
Fluoranthene	< 0.031	ug/l	0.031	0.098	1	M8270C	5/21/2018	5/22/2018	NJC	1
Fluorene	< 0.011	ug/l	0.011	0.034	1	M8270C	5/21/2018	5/22/2018	NJC	1
Indeno(1,2,3-cd)pyrene	< 0.012	ug/l	0.012	0.038	1	M8270C	5/21/2018	5/22/2018	NJC	1
1-Methyl naphthalene	< 0.0239	ug/l	0.0239	0.076	1	M8270C	5/21/2018	5/22/2018	NJC	1
2-Methyl naphthalene	< 0.0236	ug/l	0.0236	0.0751	1	M8270C	5/21/2018	5/22/2018	NJC	1
Naphthalene	< 0.023	ug/l	0.023	0.073	1	M8270C	5/21/2018	5/22/2018	NJC	1
Phenanthrene	< 0.025	ug/l	0.025	0.081	1	M8270C	5/21/2018	5/22/2018	NJC	1
Pyrene	< 0.03	ug/l	0.03	0.095	1	M8270C	5/21/2018	5/22/2018	NJC	1
VOC's										
Benzene	< 0.22	ug/l	0.22	0.71	1	8260B		5/16/2018	MJR	1
Bromobenzene	< 0.44	ug/l	0.44	1.38	1	8260B		5/16/2018	MJR	1
Bromodichloromethane	< 0.33	ug/l	0.33	1.06	1	8260B		5/16/2018	MJR	1
Bromoform	< 0.45	ug/l	0.45	1.44	1	8260B		5/16/2018	MJR	1
tert-Butylbenzene	< 0.25	ug/l	0.25	0.8	1	8260B		5/16/2018	MJR	1
sec-Butylbenzene	< 0.79	ug/l	0.79	2.53	1	8260B		5/16/2018	MJR	1
n-Butylbenzene	< 0.71	ug/l	0.71	2.25	1	8260B		5/16/2018	MJR	1
Carbon Tetrachloride	< 0.31	ug/l	0.31	0.98	1	8260B		5/16/2018	MJR	1
Chlorobenzene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
Chloroethane	< 0.61	ug/l	0.61	1.95	1	8260B		5/16/2018	MJR	1
Chloroform	< 0.26	ug/l	0.26	0.82	1	8260B		5/16/2018	MJR	1
Chloromethane	< 0.54	ug/l	0.54	1.72	1	8260B		5/16/2018	MJR	1
2-Chlorotoluene	< 0.31	ug/l	0.31	0.98	1	8260B		5/16/2018	MJR	1
4-Chlorotoluene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
1,2-Dibromo-3-chloropropane	< 2.96	ug/l	2.96	9.43	1	8260B		5/16/2018	MJR	1
Dibromochloromethane	< 0.22	ug/l	0.22	0.69	1	8260B		5/16/2018	MJR	1
1,4-Dichlorobenzene	< 0.7	ug/l	0.7	2.22	1	8260B		5/16/2018	MJR	1
1,3-Dichlorobenzene	< 0.85	ug/l	0.85	2.7	1	8260B		5/16/2018	MJR	1
1,2-Dichlorobenzene	< 0.86	ug/l	0.86	2.74	1	8260B		5/16/2018	MJR	1
Dichlorodifluoromethane	< 0.32	ug/l	0.32	1.02	1	8260B		5/16/2018	MJR	1

Project Name MSOE
 Project # 17076-005

Invoice # E34634

Lab Code 5034634C
 Sample ID MW-3
 Sample Matrix Water
 Sample Date 5/14/2018

	Result	Unit	LOD	LOQ	Dil	Method	Ext Date	Run Date	Analyst	Code
1,2-Dichloroethane	< 0.25	ug/l	0.25	0.78	1	8260B		5/16/2018	MJR	1
1,1-Dichloroethane	< 0.36	ug/l	0.36	1.14	1	8260B		5/16/2018	MJR	1
1,1-Dichloroethene	< 0.42	ug/l	0.42	1.34	1	8260B		5/16/2018	MJR	1
cis-1,2-Dichloroethene	< 0.37	ug/l	0.37	1.16	1	8260B		5/16/2018	MJR	1
trans-1,2-Dichloroethene	< 0.34	ug/l	0.34	1.07	1	8260B		5/16/2018	MJR	1
1,2-Dichloropropane	< 0.44	ug/l	0.44	1.39	1	8260B		5/16/2018	MJR	1
1,3-Dichloropropane	< 0.3	ug/l	0.3	0.94	1	8260B		5/16/2018	MJR	1
trans-1,3-Dichloropropene	< 0.32	ug/l	0.32	1.01	1	8260B		5/16/2018	MJR	1
cis-1,3-Dichloropropene	< 0.26	ug/l	0.26	0.81	1	8260B		5/16/2018	MJR	1
Di-isopropyl ether	< 0.21	ug/l	0.21	0.66	1	8260B		5/16/2018	MJR	1
EDB (1,2-Dibromoethane)	< 0.34	ug/l	0.34	1.09	1	8260B		5/16/2018	MJR	1
Ethylbenzene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
Hexachlorobutadiene	< 1.34	ug/l	1.34	4.28	1	8260B		5/16/2018	MJR	1
Isopropylbenzene	< 0.78	ug/l	0.78	2.47	1	8260B		5/16/2018	MJR	1
p-Isopropyltoluene	< 0.24	ug/l	0.24	0.76	1	8260B		5/16/2018	MJR	1
Methylene chloride	< 1.32	ug/l	1.32	4.21	1	8260B		5/16/2018	MJR	1
Methyl tert-butyl ether (MTBE)	< 0.28	ug/l	0.28	0.89	1	8260B		5/16/2018	MJR	1
Naphthalene	< 2.1	ug/l	2.1	6.65	1	8260B		5/16/2018	MJR	1
n-Propylbenzene	< 0.61	ug/l	0.61	1.95	1	8260B		5/16/2018	MJR	1
1,1,2,2-Tetrachloroethane	< 0.3	ug/l	0.3	0.97	1	8260B		5/16/2018	MJR	1
1,1,1,2-Tetrachloroethane	< 0.35	ug/l	0.35	1.13	1	8260B		5/16/2018	MJR	1
Tetrachloroethene	< 0.38	ug/l	0.38	1.21	1	8260B		5/16/2018	MJR	1
Toluene	< 0.19	ug/l	0.19	0.6	1	8260B		5/16/2018	MJR	1
1,2,4-Trichlorobenzene	< 1.15	ug/l	1.15	3.67	1	8260B		5/16/2018	MJR	1
1,2,3-Trichlorobenzene	< 1.71	ug/l	1.71	5.43	1	8260B		5/16/2018	MJR	1
1,1,1-Trichloroethane	< 0.33	ug/l	0.33	1.05	1	8260B		5/16/2018	MJR	1
1,1,2-Trichloroethane	< 0.42	ug/l	0.42	1.32	1	8260B		5/16/2018	MJR	1
Trichloroethene (TCE)	< 0.3	ug/l	0.3	0.94	1	8260B		5/16/2018	MJR	1
Trichlorofluoromethane	< 0.35	ug/l	0.35	1.1	1	8260B		5/16/2018	MJR	1
1,2,4-Trimethylbenzene	< 0.8	ug/l	0.8	2.55	1	8260B		5/16/2018	MJR	1
1,3,5-Trimethylbenzene	< 0.63	ug/l	0.63	2	1	8260B		5/16/2018	MJR	1
Vinyl Chloride	< 0.2	ug/l	0.2	0.65	1	8260B		5/16/2018	MJR	1
m&p-Xylene	< 0.43	ug/l	0.43	1.38	1	8260B		5/16/2018	MJR	1
o-Xylene	< 0.29	ug/l	0.29	0.93	1	8260B		5/16/2018	MJR	1
SUR - Toluene-d8	87	REC %			1	8260B		5/16/2018	MJR	1
SUR - Dibromofluoromethane	110	REC %			1	8260B		5/16/2018	MJR	1
SUR - 4-Bromofluorobenzene	89	REC %			1	8260B		5/16/2018	MJR	1
SUR - 1,2-Dichloroethane-d4	103	REC %			1	8260B		5/16/2018	MJR	1

Project Name MSOE
 Project # 17076-005

Invoice # E34634

Lab Code 5034634D
 Sample ID MW-4
 Sample Matrix Water
 Sample Date 5/14/2018

	Result	Unit	LOD	LOQ	Dil	Method	Ext Date	Run Date	Analyst	Code
Inorganic										
Metals										
Arsenic, Dissolved	< 0.7	ug/L	0.7	2.3	1	7060A		5/18/2018	CWT	1
Barium, Dissolved	37.0	ug/L	1.7	5.5	1	200.7		5/23/2018	CWT	1
Cadmium, Dissolved	< 0.4	ug/L	0.4	1.3	1	200.7		5/23/2018	CWT	1
Chromium, Dissolved	< 3.9	ug/L	3.9	12.8	1	200.7		5/23/2018	CWT	1
Lead, Dissolved	< 0.9	ug/L	0.9	3	1	7421		5/17/2018	CWT	1
Mercury, Dissolved	< 0.1	ug/L	0.1	0.34	1	245.1		5/17/2018	CWT	1
Selenium, Dissolved	< 1	ug/L	1	3.3	1	7740		5/24/2018	CWT	1
Silver, Dissolved	< 8.4	ug/L	8.4	28	1	200.7		5/23/2018	CWT	1
Organic										
PAH SIM										
Acenaphthene	< 0.008	ug/l	0.008	0.025	1	M8270C	5/21/2018	5/22/2018	NJC	1
Acenaphthylene	0.0107 "J"	ug/l	0.009	0.028	1	M8270C	5/21/2018	5/22/2018	NJC	1
Anthracene	< 0.009	ug/l	0.009	0.03	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(a)anthracene	< 0.017	ug/l	0.017	0.054	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(a)pyrene	< 0.017	ug/l	0.017	0.055	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(b)fluoranthene	< 0.02	ug/l	0.02	0.063	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(g,h,i)perylene	< 0.011	ug/l	0.011	0.036	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(k)fluoranthene	< 0.014	ug/l	0.014	0.044	1	M8270C	5/21/2018	5/22/2018	NJC	1
Chrysene	< 0.019	ug/l	0.019	0.062	1	M8270C	5/21/2018	5/22/2018	NJC	1
Dibenzo(a,h)anthracene	< 0.01	ug/l	0.01	0.031	1	M8270C	5/21/2018	5/22/2018	NJC	1
Fluoranthene	< 0.031	ug/l	0.031	0.098	1	M8270C	5/21/2018	5/22/2018	NJC	1
Fluorene	< 0.011	ug/l	0.011	0.034	1	M8270C	5/21/2018	5/22/2018	NJC	1
Indeno(1,2,3-cd)pyrene	< 0.012	ug/l	0.012	0.038	1	M8270C	5/21/2018	5/22/2018	NJC	1
1-Methyl naphthalene	< 0.0239	ug/l	0.0239	0.076	1	M8270C	5/21/2018	5/22/2018	NJC	1
2-Methyl naphthalene	< 0.0236	ug/l	0.0236	0.0751	1	M8270C	5/21/2018	5/22/2018	NJC	1
Naphthalene	< 0.023	ug/l	0.023	0.073	1	M8270C	5/21/2018	5/22/2018	NJC	1
Phenanthrene	< 0.025	ug/l	0.025	0.081	1	M8270C	5/21/2018	5/22/2018	NJC	1
Pyrene	< 0.03	ug/l	0.03	0.095	1	M8270C	5/21/2018	5/22/2018	NJC	1
VOC's										
Benzene	< 0.22	ug/l	0.22	0.71	1	8260B		5/16/2018	MJR	1
Bromobenzene	< 0.44	ug/l	0.44	1.38	1	8260B		5/16/2018	MJR	1
Bromodichloromethane	< 0.33	ug/l	0.33	1.06	1	8260B		5/16/2018	MJR	1
Bromoform	< 0.45	ug/l	0.45	1.44	1	8260B		5/16/2018	MJR	1
tert-Butylbenzene	< 0.25	ug/l	0.25	0.8	1	8260B		5/16/2018	MJR	1
sec-Butylbenzene	< 0.79	ug/l	0.79	2.53	1	8260B		5/16/2018	MJR	1
n-Butylbenzene	< 0.71	ug/l	0.71	2.25	1	8260B		5/16/2018	MJR	1
Carbon Tetrachloride	< 0.31	ug/l	0.31	0.98	1	8260B		5/16/2018	MJR	1
Chlorobenzene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
Chloroethane	< 0.61	ug/l	0.61	1.95	1	8260B		5/16/2018	MJR	1
Chloroform	0.52 "J"	ug/l	0.26	0.82	1	8260B		5/16/2018	MJR	1
Chloromethane	< 0.54	ug/l	0.54	1.72	1	8260B		5/16/2018	MJR	1
2-Chlorotoluene	< 0.31	ug/l	0.31	0.98	1	8260B		5/16/2018	MJR	1
4-Chlorotoluene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
1,2-Dibromo-3-chloropropane	< 2.96	ug/l	2.96	9.43	1	8260B		5/16/2018	MJR	1
Dibromochloromethane	< 0.22	ug/l	0.22	0.69	1	8260B		5/16/2018	MJR	1
1,4-Dichlorobenzene	< 0.7	ug/l	0.7	2.22	1	8260B		5/16/2018	MJR	1
1,3-Dichlorobenzene	< 0.85	ug/l	0.85	2.7	1	8260B		5/16/2018	MJR	1
1,2-Dichlorobenzene	< 0.86	ug/l	0.86	2.74	1	8260B		5/16/2018	MJR	1
Dichlorodifluoromethane	< 0.32	ug/l	0.32	1.02	1	8260B		5/16/2018	MJR	1

Project Name MSOE
Project # 17076-005

Invoice # E34634

Lab Code 5034634D
Sample ID MW-4
Sample Matrix Water
Sample Date 5/14/2018

	Result	Unit	LOD	LOQ	Dil	Method	Ext Date	Run Date	Analyst	Code
1,2-Dichloroethane	< 0.25	ug/l	0.25	0.78	1	8260B		5/16/2018	MJR	1
1,1-Dichloroethane	< 0.36	ug/l	0.36	1.14	1	8260B		5/16/2018	MJR	1
1,1-Dichloroethene	< 0.42	ug/l	0.42	1.34	1	8260B		5/16/2018	MJR	1
cis-1,2-Dichloroethene	< 0.37	ug/l	0.37	1.16	1	8260B		5/16/2018	MJR	1
trans-1,2-Dichloroethene	< 0.34	ug/l	0.34	1.07	1	8260B		5/16/2018	MJR	1
1,2-Dichloropropane	< 0.44	ug/l	0.44	1.39	1	8260B		5/16/2018	MJR	1
1,3-Dichloropropane	< 0.3	ug/l	0.3	0.94	1	8260B		5/16/2018	MJR	1
trans-1,3-Dichloropropene	< 0.32	ug/l	0.32	1.01	1	8260B		5/16/2018	MJR	1
cis-1,3-Dichloropropene	< 0.26	ug/l	0.26	0.81	1	8260B		5/16/2018	MJR	1
Di-isopropyl ether	< 0.21	ug/l	0.21	0.66	1	8260B		5/16/2018	MJR	1
EDB (1,2-Dibromoethane)	< 0.34	ug/l	0.34	1.09	1	8260B		5/16/2018	MJR	1
Ethylbenzene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
Hexachlorobutadiene	< 1.34	ug/l	1.34	4.28	1	8260B		5/16/2018	MJR	1
Isopropylbenzene	< 0.78	ug/l	0.78	2.47	1	8260B		5/16/2018	MJR	1
p-Isopropyltoluene	< 0.24	ug/l	0.24	0.76	1	8260B		5/16/2018	MJR	1
Methylene chloride	< 1.32	ug/l	1.32	4.21	1	8260B		5/16/2018	MJR	1
Methyl tert-butyl ether (MTBE)	< 0.28	ug/l	0.28	0.89	1	8260B		5/16/2018	MJR	1
Naphthalene	< 2.1	ug/l	2.1	6.65	1	8260B		5/16/2018	MJR	1
n-Propylbenzene	< 0.61	ug/l	0.61	1.95	1	8260B		5/16/2018	MJR	1
1,1,2,2-Tetrachloroethane	< 0.3	ug/l	0.3	0.97	1	8260B		5/16/2018	MJR	1
1,1,1,2-Tetrachloroethane	< 0.35	ug/l	0.35	1.13	1	8260B		5/16/2018	MJR	1
Tetrachloroethene	< 0.38	ug/l	0.38	1.21	1	8260B		5/16/2018	MJR	1
Toluene	< 0.19	ug/l	0.19	0.6	1	8260B		5/16/2018	MJR	1
1,2,4-Trichlorobenzene	< 1.15	ug/l	1.15	3.67	1	8260B		5/16/2018	MJR	1
1,2,3-Trichlorobenzene	< 1.71	ug/l	1.71	5.43	1	8260B		5/16/2018	MJR	1
1,1,1-Trichloroethane	< 0.33	ug/l	0.33	1.05	1	8260B		5/16/2018	MJR	1
1,1,2-Trichloroethane	< 0.42	ug/l	0.42	1.32	1	8260B		5/16/2018	MJR	1
Trichloroethene (TCE)	< 0.3	ug/l	0.3	0.94	1	8260B		5/16/2018	MJR	1
Trichlorofluoromethane	< 0.35	ug/l	0.35	1.1	1	8260B		5/16/2018	MJR	1
1,2,4-Trimethylbenzene	< 0.8	ug/l	0.8	2.55	1	8260B		5/16/2018	MJR	1
1,3,5-Trimethylbenzene	< 0.63	ug/l	0.63	2	1	8260B		5/16/2018	MJR	1
Vinyl Chloride	< 0.2	ug/l	0.2	0.65	1	8260B		5/16/2018	MJR	1
m&p-Xylene	< 0.43	ug/l	0.43	1.38	1	8260B		5/16/2018	MJR	1
o-Xylene	< 0.29	ug/l	0.29	0.93	1	8260B		5/16/2018	MJR	1
SUR - 4-Bromofluorobenzene	88	REC %			1	8260B		5/16/2018	MJR	1
SUR - Dibromofluoromethane	105	REC %			1	8260B		5/16/2018	MJR	1
SUR - 1,2-Dichloroethane-d4	97	REC %			1	8260B		5/16/2018	MJR	1
SUR - Toluene-d8	87	REC %			1	8260B		5/16/2018	MJR	1

Project Name MSOE
 Project # 17076-005

Invoice # E34634

Lab Code 5034634E
 Sample ID MW-5
 Sample Matrix Water
 Sample Date 5/14/2018

	Result	Unit	LOD	LOQ	Dil	Method	Ext Date	Run Date	Analyst	Code
Inorganic										
Metals										
Arsenic, Dissolved	< 0.7	ug/L	0.7	2.3	1	7060A		5/18/2018	CWT	1
Barium, Dissolved	27.0	ug/L	1.7	5.5	1	200.7		5/23/2018	CWT	1
Cadmium, Dissolved	< 0.4	ug/L	0.4	1.3	1	200.7		5/23/2018	CWT	1
Chromium, Dissolved	< 3.9	ug/L	3.9	12.8	1	200.7		5/23/2018	CWT	1
Lead, Dissolved	< 0.9	ug/L	0.9	3	1	7421		5/17/2018	CWT	1
Mercury, Dissolved	< 0.1	ug/L	0.1	0.34	1	245.1		5/17/2018	CWT	1
Selenium, Dissolved	< 1	ug/L	1	3.3	1	7740		5/24/2018	CWT	1
Silver, Dissolved	< 8.4	ug/L	8.4	28	1	200.7		5/23/2018	CWT	1
Organic										
PAH SIM										
Acenaphthene	0.0101 "J"	ug/l	0.008	0.025	1	M8270C	5/21/2018	5/22/2018	NJC	1
Acenaphthylene	< 0.009	ug/l	0.009	0.028	1	M8270C	5/21/2018	5/22/2018	NJC	1
Anthracene	< 0.009	ug/l	0.009	0.03	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(a)anthracene	< 0.017	ug/l	0.017	0.054	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(a)pyrene	< 0.017	ug/l	0.017	0.055	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(b)fluoranthene	< 0.02	ug/l	0.02	0.063	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(g,h,i)perylene	< 0.011	ug/l	0.011	0.036	1	M8270C	5/21/2018	5/22/2018	NJC	1
Benzo(k)fluoranthene	< 0.014	ug/l	0.014	0.044	1	M8270C	5/21/2018	5/22/2018	NJC	1
Chrysene	< 0.019	ug/l	0.019	0.062	1	M8270C	5/21/2018	5/22/2018	NJC	1
Dibenzo(a,h)anthracene	< 0.01	ug/l	0.01	0.031	1	M8270C	5/21/2018	5/22/2018	NJC	1
Fluoranthene	< 0.031	ug/l	0.031	0.098	1	M8270C	5/21/2018	5/22/2018	NJC	1
Fluorene	< 0.011	ug/l	0.011	0.034	1	M8270C	5/21/2018	5/22/2018	NJC	1
Indeno(1,2,3-cd)pyrene	< 0.012	ug/l	0.012	0.038	1	M8270C	5/21/2018	5/22/2018	NJC	1
1-Methyl naphthalene	< 0.0239	ug/l	0.0239	0.076	1	M8270C	5/21/2018	5/22/2018	NJC	1
2-Methyl naphthalene	< 0.0236	ug/l	0.0236	0.0751	1	M8270C	5/21/2018	5/22/2018	NJC	1
Naphthalene	< 0.023	ug/l	0.023	0.073	1	M8270C	5/21/2018	5/22/2018	NJC	1
Phenanthrene	< 0.025	ug/l	0.025	0.081	1	M8270C	5/21/2018	5/22/2018	NJC	1
Pyrene	< 0.03	ug/l	0.03	0.095	1	M8270C	5/21/2018	5/22/2018	NJC	1
VOC's										
Benzene	< 0.22	ug/l	0.22	0.71	1	8260B		5/16/2018	MJR	1
Bromobenzene	< 0.44	ug/l	0.44	1.38	1	8260B		5/16/2018	MJR	1
Bromodichloromethane	0.86 "J"	ug/l	0.33	1.06	1	8260B		5/16/2018	MJR	1
Bromoform	< 0.45	ug/l	0.45	1.44	1	8260B		5/16/2018	MJR	1
tert-Butylbenzene	< 0.25	ug/l	0.25	0.8	1	8260B		5/16/2018	MJR	1
sec-Butylbenzene	< 0.79	ug/l	0.79	2.53	1	8260B		5/16/2018	MJR	1
n-Butylbenzene	< 0.71	ug/l	0.71	2.25	1	8260B		5/16/2018	MJR	1
Carbon Tetrachloride	< 0.31	ug/l	0.31	0.98	1	8260B		5/16/2018	MJR	1
Chlorobenzene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
Chloroethane	< 0.61	ug/l	0.61	1.95	1	8260B		5/16/2018	MJR	1
Chloroform	1.94	ug/l	0.26	0.82	1	8260B		5/16/2018	MJR	1
Chloromethane	< 0.54	ug/l	0.54	1.72	1	8260B		5/16/2018	MJR	1
2-Chlorotoluene	< 0.31	ug/l	0.31	0.98	1	8260B		5/16/2018	MJR	1
4-Chlorotoluene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
1,2-Dibromo-3-chloropropane	< 2.96	ug/l	2.96	9.43	1	8260B		5/16/2018	MJR	1
Dibromochloromethane	< 0.22	ug/l	0.22	0.69	1	8260B		5/16/2018	MJR	1
1,4-Dichlorobenzene	< 0.7	ug/l	0.7	2.22	1	8260B		5/16/2018	MJR	1
1,3-Dichlorobenzene	< 0.85	ug/l	0.85	2.7	1	8260B		5/16/2018	MJR	1
1,2-Dichlorobenzene	< 0.86	ug/l	0.86	2.74	1	8260B		5/16/2018	MJR	1
Dichlorodifluoromethane	< 0.32	ug/l	0.32	1.02	1	8260B		5/16/2018	MJR	1

Project Name MSOE
Project # 17076-005

Invoice # E34634

Lab Code 5034634E
Sample ID MW-5
Sample Matrix Water
Sample Date 5/14/2018

	Result	Unit	LOD	LOQ	Dil	Method	Ext Date	Run Date	Analyst	Code
1,2-Dichloroethane	< 0.25	ug/l	0.25	0.78	1	8260B		5/16/2018	MJR	1
1,1-Dichloroethane	< 0.36	ug/l	0.36	1.14	1	8260B		5/16/2018	MJR	1
1,1-Dichloroethene	< 0.42	ug/l	0.42	1.34	1	8260B		5/16/2018	MJR	1
cis-1,2-Dichloroethene	< 0.37	ug/l	0.37	1.16	1	8260B		5/16/2018	MJR	1
trans-1,2-Dichloroethene	< 0.34	ug/l	0.34	1.07	1	8260B		5/16/2018	MJR	1
1,2-Dichloropropane	< 0.44	ug/l	0.44	1.39	1	8260B		5/16/2018	MJR	1
1,3-Dichloropropane	< 0.3	ug/l	0.3	0.94	1	8260B		5/16/2018	MJR	1
trans-1,3-Dichloropropene	< 0.32	ug/l	0.32	1.01	1	8260B		5/16/2018	MJR	1
cis-1,3-Dichloropropene	< 0.26	ug/l	0.26	0.81	1	8260B		5/16/2018	MJR	1
Di-isopropyl ether	< 0.21	ug/l	0.21	0.66	1	8260B		5/16/2018	MJR	1
EDB (1,2-Dibromoethane)	< 0.34	ug/l	0.34	1.09	1	8260B		5/16/2018	MJR	1
Ethylbenzene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
Hexachlorobutadiene	< 1.34	ug/l	1.34	4.28	1	8260B		5/16/2018	MJR	1
Isopropylbenzene	< 0.78	ug/l	0.78	2.47	1	8260B		5/16/2018	MJR	1
p-Isopropyltoluene	< 0.24	ug/l	0.24	0.76	1	8260B		5/16/2018	MJR	1
Methylene chloride	< 1.32	ug/l	1.32	4.21	1	8260B		5/16/2018	MJR	1
Methyl tert-butyl ether (MTBE)	< 0.28	ug/l	0.28	0.89	1	8260B		5/16/2018	MJR	1
Naphthalene	< 2.1	ug/l	2.1	6.65	1	8260B		5/16/2018	MJR	1
n-Propylbenzene	< 0.61	ug/l	0.61	1.95	1	8260B		5/16/2018	MJR	1
1,1,2,2-Tetrachloroethane	< 0.3	ug/l	0.3	0.97	1	8260B		5/16/2018	MJR	1
1,1,1,2-Tetrachloroethane	< 0.35	ug/l	0.35	1.13	1	8260B		5/16/2018	MJR	1
Tetrachloroethene	< 0.38	ug/l	0.38	1.21	1	8260B		5/16/2018	MJR	1
Toluene	< 0.19	ug/l	0.19	0.6	1	8260B		5/16/2018	MJR	1
1,2,4-Trichlorobenzene	< 1.15	ug/l	1.15	3.67	1	8260B		5/16/2018	MJR	1
1,2,3-Trichlorobenzene	< 1.71	ug/l	1.71	5.43	1	8260B		5/16/2018	MJR	1
1,1,1-Trichloroethane	< 0.33	ug/l	0.33	1.05	1	8260B		5/16/2018	MJR	1
1,1,2-Trichloroethane	< 0.42	ug/l	0.42	1.32	1	8260B		5/16/2018	MJR	1
Trichloroethene (TCE)	< 0.3	ug/l	0.3	0.94	1	8260B		5/16/2018	MJR	1
Trichlorofluoromethane	< 0.35	ug/l	0.35	1.1	1	8260B		5/16/2018	MJR	1
1,2,4-Trimethylbenzene	< 0.8	ug/l	0.8	2.55	1	8260B		5/16/2018	MJR	1
1,3,5-Trimethylbenzene	< 0.63	ug/l	0.63	2	1	8260B		5/16/2018	MJR	1
Vinyl Chloride	< 0.2	ug/l	0.2	0.65	1	8260B		5/16/2018	MJR	1
m&p-Xylene	< 0.43	ug/l	0.43	1.38	1	8260B		5/16/2018	MJR	1
o-Xylene	< 0.29	ug/l	0.29	0.93	1	8260B		5/16/2018	MJR	1
SUR - Toluene-d8	89	REC %			1	8260B		5/16/2018	MJR	1
SUR - Dibromofluoromethane	112	REC %			1	8260B		5/16/2018	MJR	1
SUR - 4-Bromofluorobenzene	88	REC %			1	8260B		5/16/2018	MJR	1
SUR - 1,2-Dichloroethane-d4	106	REC %			1	8260B		5/16/2018	MJR	1

Project Name MSOE
 Project # 17076-005

Invoice # E34634

Lab Code 5034634F
 Sample ID DUPLICATE
 Sample Matrix Water
 Sample Date 5/14/2018

	Result	Unit	LOD	LOQ	Dil	Method	Ext Date	Run Date	Analyst	Code
Organic										
VOC's										
Benzene	< 0.22	ug/l	0.22	0.71	1	8260B		5/16/2018	MJR	1
Bromobenzene	< 0.44	ug/l	0.44	1.38	1	8260B		5/16/2018	MJR	1
Bromodichloromethane	0.87 "J"	ug/l	0.33	1.06	1	8260B		5/16/2018	MJR	1
Bromoform	< 0.45	ug/l	0.45	1.44	1	8260B		5/16/2018	MJR	1
tert-Butylbenzene	< 0.25	ug/l	0.25	0.8	1	8260B		5/16/2018	MJR	1
sec-Butylbenzene	< 0.79	ug/l	0.79	2.53	1	8260B		5/16/2018	MJR	1
n-Butylbenzene	< 0.71	ug/l	0.71	2.25	1	8260B		5/16/2018	MJR	1
Carbon Tetrachloride	< 0.31	ug/l	0.31	0.98	1	8260B		5/16/2018	MJR	1
Chlorobenzene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
Chloroethane	< 0.61	ug/l	0.61	1.95	1	8260B		5/16/2018	MJR	1
Chloroform	1.84	ug/l	0.26	0.82	1	8260B		5/16/2018	MJR	1
Chloromethane	< 0.54	ug/l	0.54	1.72	1	8260B		5/16/2018	MJR	1
2-Chlorotoluene	< 0.31	ug/l	0.31	0.98	1	8260B		5/16/2018	MJR	1
4-Chlorotoluene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
1,2-Dibromo-3-chloropropane	< 2.96	ug/l	2.96	9.43	1	8260B		5/16/2018	MJR	1
Dibromochloromethane	0.22 "J"	ug/l	0.22	0.69	1	8260B		5/16/2018	MJR	1
1,4-Dichlorobenzene	< 0.7	ug/l	0.7	2.22	1	8260B		5/16/2018	MJR	1
1,3-Dichlorobenzene	< 0.85	ug/l	0.85	2.7	1	8260B		5/16/2018	MJR	1
1,2-Dichlorobenzene	< 0.86	ug/l	0.86	2.74	1	8260B		5/16/2018	MJR	1
Dichlorodifluoromethane	< 0.32	ug/l	0.32	1.02	1	8260B		5/16/2018	MJR	1
1,2-Dichloroethane	< 0.25	ug/l	0.25	0.78	1	8260B		5/16/2018	MJR	1
1,1-Dichloroethane	< 0.36	ug/l	0.36	1.14	1	8260B		5/16/2018	MJR	1
1,1-Dichloroethene	< 0.42	ug/l	0.42	1.34	1	8260B		5/16/2018	MJR	1
cis-1,2-Dichloroethene	< 0.37	ug/l	0.37	1.16	1	8260B		5/16/2018	MJR	1
trans-1,2-Dichloroethene	< 0.34	ug/l	0.34	1.07	1	8260B		5/16/2018	MJR	1
1,2-Dichloropropane	< 0.44	ug/l	0.44	1.39	1	8260B		5/16/2018	MJR	1
1,3-Dichloropropane	< 0.3	ug/l	0.3	0.94	1	8260B		5/16/2018	MJR	1
trans-1,3-Dichloropropene	< 0.32	ug/l	0.32	1.01	1	8260B		5/16/2018	MJR	1
cis-1,3-Dichloropropene	< 0.26	ug/l	0.26	0.81	1	8260B		5/16/2018	MJR	1
Di-isopropyl ether	< 0.21	ug/l	0.21	0.66	1	8260B		5/16/2018	MJR	1
EDB (1,2-Dibromoethane)	< 0.34	ug/l	0.34	1.09	1	8260B		5/16/2018	MJR	1
Ethylbenzene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
Hexachlorobutadiene	< 1.34	ug/l	1.34	4.28	1	8260B		5/16/2018	MJR	1
Isopropylbenzene	< 0.78	ug/l	0.78	2.47	1	8260B		5/16/2018	MJR	1
p-Isopropyltoluene	< 0.24	ug/l	0.24	0.76	1	8260B		5/16/2018	MJR	1
Methylene chloride	< 1.32	ug/l	1.32	4.21	1	8260B		5/16/2018	MJR	1
Methyl tert-butyl ether (MTBE)	< 0.28	ug/l	0.28	0.89	1	8260B		5/16/2018	MJR	1
Naphthalene	< 2.1	ug/l	2.1	6.65	1	8260B		5/16/2018	MJR	1
n-Propylbenzene	< 0.61	ug/l	0.61	1.95	1	8260B		5/16/2018	MJR	1
1,1,2,2-Tetrachloroethane	< 0.3	ug/l	0.3	0.97	1	8260B		5/16/2018	MJR	1
1,1,1,2-Tetrachloroethane	< 0.35	ug/l	0.35	1.13	1	8260B		5/16/2018	MJR	1
Tetrachloroethene	< 0.38	ug/l	0.38	1.21	1	8260B		5/16/2018	MJR	1
Toluene	< 0.19	ug/l	0.19	0.6	1	8260B		5/16/2018	MJR	1
1,2,4-Trichlorobenzene	< 1.15	ug/l	1.15	3.67	1	8260B		5/16/2018	MJR	1
1,2,3-Trichlorobenzene	< 1.71	ug/l	1.71	5.43	1	8260B		5/16/2018	MJR	1
1,1,1-Trichloroethane	< 0.33	ug/l	0.33	1.05	1	8260B		5/16/2018	MJR	1
1,1,2-Trichloroethane	< 0.42	ug/l	0.42	1.32	1	8260B		5/16/2018	MJR	1
Trichloroethene (TCE)	< 0.3	ug/l	0.3	0.94	1	8260B		5/16/2018	MJR	1
Trichlorofluoromethane	< 0.35	ug/l	0.35	1.1	1	8260B		5/16/2018	MJR	1
1,2,4-Trimethylbenzene	< 0.8	ug/l	0.8	2.55	1	8260B		5/16/2018	MJR	1

Project Name MSOE
Project # 17076-005

Invoice # E34634

Lab Code 5034634F
Sample ID DUPLICATE
Sample Matrix Water
Sample Date 5/14/2018

	Result	Unit	LOD	LOQ	Dil	Method	Ext Date	Run Date	Analyst	Code
1,3,5-Trimethylbenzene	< 0.63	ug/l	0.63	2	1	8260B	5/16/2018	5/16/2018	MJR	1
Vinyl Chloride	< 0.2	ug/l	0.2	0.65	1	8260B	5/16/2018	5/16/2018	MJR	1
m&p-Xylene	< 0.43	ug/l	0.43	1.38	1	8260B	5/16/2018	5/16/2018	MJR	1
o-Xylene	< 0.29	ug/l	0.29	0.93	1	8260B	5/16/2018	5/16/2018	MJR	1
SUR - 4-Bromofluorobenzene	87	REC %			1	8260B	5/16/2018	5/16/2018	MJR	1
SUR - Dibromofluoromethane	110	REC %			1	8260B	5/16/2018	5/16/2018	MJR	1
SUR - 1,2-Dichloroethane-d4	105	REC %			1	8260B	5/16/2018	5/16/2018	MJR	1
SUR - Toluene-d8	88	REC %			1	8260B	5/16/2018	5/16/2018	MJR	1

Project Name MSOE
 Project # 17076-005

Invoice # E34634

Lab Code 5034634G
 Sample ID EQUIP BLK
 Sample Matrix Water
 Sample Date 5/14/2018

	Result	Unit	LOD	LOQ	Dil	Method	Ext Date	Run Date	Analyst	Code
Organic										
VOC's										
Benzene	< 0.22	ug/l	0.22	0.71	1	8260B		5/16/2018	MJR	1
Bromobenzene	< 0.44	ug/l	0.44	1.38	1	8260B		5/16/2018	MJR	1
Bromodichloromethane	< 0.33	ug/l	0.33	1.06	1	8260B		5/16/2018	MJR	1
Bromoform	< 0.45	ug/l	0.45	1.44	1	8260B		5/16/2018	MJR	1
tert-Butylbenzene	< 0.25	ug/l	0.25	0.8	1	8260B		5/16/2018	MJR	1
sec-Butylbenzene	< 0.79	ug/l	0.79	2.53	1	8260B		5/16/2018	MJR	1
n-Butylbenzene	< 0.71	ug/l	0.71	2.25	1	8260B		5/16/2018	MJR	1
Carbon Tetrachloride	< 0.31	ug/l	0.31	0.98	1	8260B		5/16/2018	MJR	1
Chlorobenzene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
Chloroethane	< 0.61	ug/l	0.61	1.95	1	8260B		5/16/2018	MJR	1
Chloroform	< 0.26	ug/l	0.26	0.82	1	8260B		5/16/2018	MJR	1
Chloromethane	< 0.54	ug/l	0.54	1.72	1	8260B		5/16/2018	MJR	1
2-Chlorotoluene	< 0.31	ug/l	0.31	0.98	1	8260B		5/16/2018	MJR	1
4-Chlorotoluene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
1,2-Dibromo-3-chloropropane	< 2.96	ug/l	2.96	9.43	1	8260B		5/16/2018	MJR	1
Dibromochloromethane	< 0.22	ug/l	0.22	0.69	1	8260B		5/16/2018	MJR	1
1,4-Dichlorobenzene	< 0.7	ug/l	0.7	2.22	1	8260B		5/16/2018	MJR	1
1,3-Dichlorobenzene	< 0.85	ug/l	0.85	2.7	1	8260B		5/16/2018	MJR	1
1,2-Dichlorobenzene	< 0.86	ug/l	0.86	2.74	1	8260B		5/16/2018	MJR	1
Dichlorodifluoromethane	< 0.32	ug/l	0.32	1.02	1	8260B		5/16/2018	MJR	1
1,2-Dichloroethane	< 0.25	ug/l	0.25	0.78	1	8260B		5/16/2018	MJR	1
1,1-Dichloroethane	< 0.36	ug/l	0.36	1.14	1	8260B		5/16/2018	MJR	1
1,1-Dichloroethene	< 0.42	ug/l	0.42	1.34	1	8260B		5/16/2018	MJR	1
cis-1,2-Dichloroethene	< 0.37	ug/l	0.37	1.16	1	8260B		5/16/2018	MJR	1
trans-1,2-Dichloroethene	< 0.34	ug/l	0.34	1.07	1	8260B		5/16/2018	MJR	1
1,2-Dichloropropane	< 0.44	ug/l	0.44	1.39	1	8260B		5/16/2018	MJR	1
1,3-Dichloropropane	< 0.3	ug/l	0.3	0.94	1	8260B		5/16/2018	MJR	1
trans-1,3-Dichloropropene	< 0.32	ug/l	0.32	1.01	1	8260B		5/16/2018	MJR	1
cis-1,3-Dichloropropene	< 0.26	ug/l	0.26	0.81	1	8260B		5/16/2018	MJR	1
Di-isopropyl ether	< 0.21	ug/l	0.21	0.66	1	8260B		5/16/2018	MJR	1
EDB (1,2-Dibromoethane)	< 0.34	ug/l	0.34	1.09	1	8260B		5/16/2018	MJR	1
Ethylbenzene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
Hexachlorobutadiene	< 1.34	ug/l	1.34	4.28	1	8260B		5/16/2018	MJR	1
Isopropylbenzene	< 0.78	ug/l	0.78	2.47	1	8260B		5/16/2018	MJR	1
p-Isopropyltoluene	< 0.24	ug/l	0.24	0.76	1	8260B		5/16/2018	MJR	1
Methylene chloride	< 1.32	ug/l	1.32	4.21	1	8260B		5/16/2018	MJR	1
Methyl tert-butyl ether (MTBE)	< 0.28	ug/l	0.28	0.89	1	8260B		5/16/2018	MJR	1
Naphthalene	< 2.1	ug/l	2.1	6.65	1	8260B		5/16/2018	MJR	1
n-Propylbenzene	< 0.61	ug/l	0.61	1.95	1	8260B		5/16/2018	MJR	1
1,1,2,2-Tetrachloroethane	< 0.3	ug/l	0.3	0.97	1	8260B		5/16/2018	MJR	1
1,1,1,2-Tetrachloroethane	< 0.35	ug/l	0.35	1.13	1	8260B		5/16/2018	MJR	1
Tetrachloroethene	< 0.38	ug/l	0.38	1.21	1	8260B		5/16/2018	MJR	1
Toluene	< 0.19	ug/l	0.19	0.6	1	8260B		5/16/2018	MJR	1
1,2,4-Trichlorobenzene	< 1.15	ug/l	1.15	3.67	1	8260B		5/16/2018	MJR	1
1,2,3-Trichlorobenzene	< 1.71	ug/l	1.71	5.43	1	8260B		5/16/2018	MJR	1
1,1,1-Trichloroethane	< 0.33	ug/l	0.33	1.05	1	8260B		5/16/2018	MJR	1
1,1,2-Trichloroethane	< 0.42	ug/l	0.42	1.32	1	8260B		5/16/2018	MJR	1
Trichloroethene (TCE)	< 0.3	ug/l	0.3	0.94	1	8260B		5/16/2018	MJR	1
Trichlorofluoromethane	< 0.35	ug/l	0.35	1.1	1	8260B		5/16/2018	MJR	1
1,2,4-Trimethylbenzene	< 0.8	ug/l	0.8	2.55	1	8260B		5/16/2018	MJR	1

Project Name MSOE
Project # 17076-005

Invoice # E34634

Lab Code 5034634G
Sample ID EQUIP BLK
Sample Matrix Water
Sample Date 5/14/2018

	Result	Unit	LOD	LOQ	Dil	Method	Ext Date	Run Date	Analyst	Code
1,3,5-Trimethylbenzene	< 0.63	ug/l	0.63	2	1	8260B	5/16/2018	5/16/2018	MJR	1
Vinyl Chloride	< 0.2	ug/l	0.2	0.65	1	8260B	5/16/2018	5/16/2018	MJR	1
m&p-Xylene	< 0.43	ug/l	0.43	1.38	1	8260B	5/16/2018	5/16/2018	MJR	1
o-Xylene	< 0.29	ug/l	0.29	0.93	1	8260B	5/16/2018	5/16/2018	MJR	1
SUR - 1,2-Dichloroethane-d4	114	REC %			1	8260B	5/16/2018	5/16/2018	MJR	1
SUR - 4-Bromofluorobenzene	94	REC %			1	8260B	5/16/2018	5/16/2018	MJR	1
SUR - Dibromofluoromethane	112	REC %			1	8260B	5/16/2018	5/16/2018	MJR	1
SUR - Toluene-d8	88	REC %			1	8260B	5/16/2018	5/16/2018	MJR	1

Project Name MSOE
 Project # 17076-005

Invoice # E34634

Lab Code 5034634H
 Sample ID TRIP BLK
 Sample Matrix Water
 Sample Date 5/14/2018

	Result	Unit	LOD	LOQ	Dil	Method	Ext Date	Run Date	Analyst	Code
Organic										
VOC's										
Benzene	< 0.22	ug/l	0.22	0.71	1	8260B		5/16/2018	MJR	1
Bromobenzene	< 0.44	ug/l	0.44	1.38	1	8260B		5/16/2018	MJR	1
Bromodichloromethane	< 0.33	ug/l	0.33	1.06	1	8260B		5/16/2018	MJR	1
Bromoform	< 0.45	ug/l	0.45	1.44	1	8260B		5/16/2018	MJR	1
tert-Butylbenzene	< 0.25	ug/l	0.25	0.8	1	8260B		5/16/2018	MJR	1
sec-Butylbenzene	< 0.79	ug/l	0.79	2.53	1	8260B		5/16/2018	MJR	1
n-Butylbenzene	< 0.71	ug/l	0.71	2.25	1	8260B		5/16/2018	MJR	1
Carbon Tetrachloride	< 0.31	ug/l	0.31	0.98	1	8260B		5/16/2018	MJR	1
Chlorobenzene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
Chloroethane	< 0.61	ug/l	0.61	1.95	1	8260B		5/16/2018	MJR	1
Chloroform	< 0.26	ug/l	0.26	0.82	1	8260B		5/16/2018	MJR	1
Chloromethane	< 0.54	ug/l	0.54	1.72	1	8260B		5/16/2018	MJR	1
2-Chlorotoluene	< 0.31	ug/l	0.31	0.98	1	8260B		5/16/2018	MJR	1
4-Chlorotoluene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
1,2-Dibromo-3-chloropropane	< 2.96	ug/l	2.96	9.43	1	8260B		5/16/2018	MJR	1
Dibromochloromethane	< 0.22	ug/l	0.22	0.69	1	8260B		5/16/2018	MJR	1
1,4-Dichlorobenzene	< 0.7	ug/l	0.7	2.22	1	8260B		5/16/2018	MJR	1
1,3-Dichlorobenzene	< 0.85	ug/l	0.85	2.7	1	8260B		5/16/2018	MJR	1
1,2-Dichlorobenzene	< 0.86	ug/l	0.86	2.74	1	8260B		5/16/2018	MJR	1
Dichlorodifluoromethane	< 0.32	ug/l	0.32	1.02	1	8260B		5/16/2018	MJR	1
1,2-Dichloroethane	< 0.25	ug/l	0.25	0.78	1	8260B		5/16/2018	MJR	1
1,1-Dichloroethane	< 0.36	ug/l	0.36	1.14	1	8260B		5/16/2018	MJR	1
1,1-Dichloroethene	< 0.42	ug/l	0.42	1.34	1	8260B		5/16/2018	MJR	1
cis-1,2-Dichloroethene	< 0.37	ug/l	0.37	1.16	1	8260B		5/16/2018	MJR	1
trans-1,2-Dichloroethene	< 0.34	ug/l	0.34	1.07	1	8260B		5/16/2018	MJR	1
1,2-Dichloropropane	< 0.44	ug/l	0.44	1.39	1	8260B		5/16/2018	MJR	1
1,3-Dichloropropane	< 0.3	ug/l	0.3	0.94	1	8260B		5/16/2018	MJR	1
trans-1,3-Dichloropropene	< 0.32	ug/l	0.32	1.01	1	8260B		5/16/2018	MJR	1
cis-1,3-Dichloropropene	< 0.26	ug/l	0.26	0.81	1	8260B		5/16/2018	MJR	1
Di-isopropyl ether	< 0.21	ug/l	0.21	0.66	1	8260B		5/16/2018	MJR	1
EDB (1,2-Dibromoethane)	< 0.34	ug/l	0.34	1.09	1	8260B		5/16/2018	MJR	1
Ethylbenzene	< 0.26	ug/l	0.26	0.83	1	8260B		5/16/2018	MJR	1
Hexachlorobutadiene	< 1.34	ug/l	1.34	4.28	1	8260B		5/16/2018	MJR	1
Isopropylbenzene	< 0.78	ug/l	0.78	2.47	1	8260B		5/16/2018	MJR	1
p-Isopropyltoluene	< 0.24	ug/l	0.24	0.76	1	8260B		5/16/2018	MJR	1
Methylene chloride	< 1.32	ug/l	1.32	4.21	1	8260B		5/16/2018	MJR	1
Methyl tert-butyl ether (MTBE)	< 0.28	ug/l	0.28	0.89	1	8260B		5/16/2018	MJR	1
Naphthalene	< 2.1	ug/l	2.1	6.65	1	8260B		5/16/2018	MJR	1
n-Propylbenzene	< 0.61	ug/l	0.61	1.95	1	8260B		5/16/2018	MJR	1
1,1,2,2-Tetrachloroethane	< 0.3	ug/l	0.3	0.97	1	8260B		5/16/2018	MJR	1
1,1,1,2-Tetrachloroethane	< 0.35	ug/l	0.35	1.13	1	8260B		5/16/2018	MJR	1
Tetrachloroethene	< 0.38	ug/l	0.38	1.21	1	8260B		5/16/2018	MJR	1
Toluene	< 0.19	ug/l	0.19	0.6	1	8260B		5/16/2018	MJR	1
1,2,4-Trichlorobenzene	< 1.15	ug/l	1.15	3.67	1	8260B		5/16/2018	MJR	1
1,2,3-Trichlorobenzene	< 1.71	ug/l	1.71	5.43	1	8260B		5/16/2018	MJR	1
1,1,1-Trichloroethane	< 0.33	ug/l	0.33	1.05	1	8260B		5/16/2018	MJR	1
1,1,2-Trichloroethane	< 0.42	ug/l	0.42	1.32	1	8260B		5/16/2018	MJR	1
Trichloroethene (TCE)	< 0.3	ug/l	0.3	0.94	1	8260B		5/16/2018	MJR	1
Trichlorofluoromethane	< 0.35	ug/l	0.35	1.1	1	8260B		5/16/2018	MJR	1
1,2,4-Trimethylbenzene	< 0.8	ug/l	0.8	2.55	1	8260B		5/16/2018	MJR	1

Project Name MSOE
Project # 17076-005

Invoice # E34634

Lab Code 5034634H
Sample ID TRIP BLK
Sample Matrix Water
Sample Date 5/14/2018

	Result	Unit	LOD	LOQ	Dil	Method	Ext Date	Run Date	Analyst	Code
1,3,5-Trimethylbenzene	< 0.63	ug/l	0.63	2	1	8260B		5/16/2018	MJR	1
Vinyl Chloride	< 0.2	ug/l	0.2	0.65	1	8260B		5/16/2018	MJR	1
m&p-Xylene	< 0.43	ug/l	0.43	1.38	1	8260B		5/16/2018	MJR	1
o-Xylene	< 0.29	ug/l	0.29	0.93	1	8260B		5/16/2018	MJR	1
SUR - Toluene-d8	88	REC %			1	8260B		5/16/2018	MJR	1
SUR - 1,2-Dichloroethane-d4	107	REC %			1	8260B		5/16/2018	MJR	1
SUR - 4-Bromofluorobenzene	90	REC %			1	8260B		5/16/2018	MJR	1
SUR - Dibromofluoromethane	110	REC %			1	8260B		5/16/2018	MJR	1

"J" Flag: Analyte detected between LOD and LOQ

LOD Limit of Detection

LOQ Limit of Quantitation

Code **Comment**

1 Laboratory QC within limits.

45 Method of Standard Additions used to perform this test.

CWT denotes sub contract lab - Certification #445126660

All solid sample results reported on a dry weight basis unless otherwise indicated. All LOD's and LOQ's are adjusted for dilutions but not dry weight. Subcontracted results are denoted by SUB in the analyst field.

Authorized Signature



Environmental Lab, Inc.

1990 Prospect Ct. • Appleton, WI 54914
920-830-2455 • FAX 920-733-0631

Sample Handling Request

Rush Analysis Date Required _____
(Rushes accepted only with prior authorization)

Normal Turn Around

Lab I.D. # _____
Account No. : _____ Quote No.: standard
Project #: 17076-005
Sampler: (signature) Ann Mulvey

Project (Name / Location): M50E
Reports To: Adam Roder Invoice To: same
Company The Sigma Group, Inc. Company _____
Address 1300 W. Canal St. Address _____
City State Zip Milwaukee, WI 53233 City State Zip _____
Phone 414-643-4200 Phone _____
FAX 414-643-4210 FAX _____

Analysis Requested

Other Analysis

Lab I.D.	Sample I.D.	Collection		Comp	Grab	Filtered Y/N	No. of Containers	Sample Type (Matrix)*	Preservation	DRO (Mod DRO Sep 95)	GRO (Mod GRO Sep 95)	LEAD	NITRATE/NITRITE	OIL & GREASE	PAH (EPA 8270)	PCB	PVOC (EPA 8021)	PVOC + NAPHTHALENE	SULFATE	TOTAL SUSPENDED SOLIDS	VOC DW (EPA 542.2)	VOC (EPA 8260)	8-PCRA METALS - dissolved	PID/ FID
		Date	Time																					
503484 A	MW-1	5/14/18	12:05			Y	5	GW	HEX/ANES													X	X	
B	MW-2	5/14/18	11:00			Y	5	GW														X	X	
C	MW-3	5/14/18	10:00			Y	5	GW														X	X	
D	MW-4	5/14/18	9:20			Y	5	GW														X	X	
E	MW-5	5/14/18	13:05			Y	5	GW														X	X	
F	Duplicate	5/14/18	-			N	3	GW	HEX													X	X	
G	Equip. BIK.	5/14/18	-			N	2	-														X	X	
H	Trip Blank	-	-			N	1	-														X	X	

Comments/Special Instructions (*Specify groundwater "GW", Drinking Water "DW", Waste Water "WW", Soil "S", Air "A", Oil, Sludge etc.)

Sample Integrity - To be completed by receiving lab.
Method of Shipment: GC
Temp. of Temp. Blank _____ °C On Ice:
Cooler seal intact upon receipt: Yes No

Relinquished By: (sign) Ann Mulvey Time 13:50 Date 5/14/18
Received By: (sign) _____ Time _____ Date _____
Received in Laboratory By: Chun H. Park Time: 8:00 Date: 5/15/18