AECOM

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July 27, 2018

Mr. Girish Desai
New York State Department of Environmental Conservation
Division of Environmental Remediation
Building 40 – SUNY, Stony Brook
Stony Brook, New York 11790-2356

Re: Groundwater Sampling Results
Operable Unit No. 2
Former Columbia Cement Company Facility
Freeport, New York
Site ID No. 130052

Dear Mr. Desai:

The purpose of this letter is to present to the New York State Department of Environmental Conservation (NYSDEC) the results of groundwater sampling conducted in March 2018 at Operable Unit Operable Unit No. 2 (OU-2) of the former Columbia Cement Company site (site ID No. 130052) in Freeport, New York, (Site). AECOM (formerly URS) conducted the sampling on behalf of Burmah Castrol Holdings, Inc. (Burmah Castrol).

Operable Unit No. 1 (OU-1), located at 159 Hanse Avenue, has undergone several rounds of investigation and remediation. In March 2009, NYSDEC issued a Record of Decision (ROD) for OU-1. In the OU-1 ROD, in-situ chemical oxidation (ISCO) was selected to remediate source area soil and groundwater, aerobic bioremediation to treat downgradient groundwater and a sub-slab depressurization system (SSDS) was selected to address vapor intrusion in the Site building. Several rounds of ISCO injections have been conducted in the OU-1 spill area and downgradient Site boundary (loading dock area). The most recent injections took place in October and November 2016. Post-injection sampling was performed through February 2017. A Remedial Action Report for the 2016 injections was submitted to NYSDEC in March 2017.

In March 2016, AECOM submitted a Revised Feasibility Study (FS) Report for OU-2 to NYSDEC. In the Revised FS Report, No Further Action with Groundwater Monitoring (NFA-GW) was recommended as the remedy to manage groundwater impacts in OU-2 resulting from releases at OU-1. In November 2016, NYSDEC published a Proposed Remedial Action Plan (PRAP) for OU-2, naming NFA-GW as the proposed remedy for OU-2. NYSDEC issued a ROD for OU-2 that was published on March 16, 2017, in which NFA-GW was selected as the OU-2 remedy. Subsequently, in March 2016, one additional monitoring well (MW-17-27S) was installed in OU-2 and 13 wells were sampled. In May 2017, two additional wells (MW-17-28S

and MW-17-29D) were installed to replace MW-07-16S and MW-07-17D, which were inaccessible.

The Site is underlain by the Upper Glacial deposits, which consists of a sand unit, as well as fill material related to the former use of the area as a municipal landfill, and tidal march deposits (peat). These units extend to a depth of approximately 35 feet. From approximately 35 to 50 feet below grade, is a gray clay which acts as a lower confining layer. Beneath the clay is the Magothy Aquifer. Well MW-00-11A is a double-cased well in the OU-1 spill area that is screened in the Magothy aquifer. No Site-related VOCs have been detected in MW-00-11A to date, suggesting the lower clay prevents vertical migration of contaminants from the Upper Glacial deposits to the Magothy aquifer.

Groundwater flow at the Site is generally east to west, toward Freeport Creek (Figure 1). Close to Freeport Creek, groundwater flow is influenced by tidal fluctuations in the creek, resulting in cyclical flow reversals adjacent to the creek. Freeport is also along the southern shore of Long Island and subject to salt water encroachment. For these reasons, the water table (Upper Glacial) aquifer at the Site is not utilized for water supply. The Village of Freeport obtains its water supply from 11 supply wells drilled into the Magothy Aquifer, ranging from 550 to 750 feet below grade. The wells are at multiple locations in Freeport, the well field closest to the Site being at Lakeview Avenue and Jessie Street, which is located approximately 1.3 miles north (side-gradient) from the Site. Thus, the groundwater constituents do not represent a risk to, nor do they have the potential to impact public water supply.

In 2015 and 2018, AECOM submitted Freedom of Information Law (FOIL) requests to the NYSDEC Division of Water requesting information on supply wells in the vicinity of the Site. The FOIL requests yielded well completion records for industrial cooling water wells at 56 Mill Road and 100 Doxsee Avenue in Freeport. In addition NYSDOH has indicated a supply well of indeterminate use may be present at 72 Albany Avenue in Freeport. AECOM inquired with Freeport Water whether these properties were supplied with potable water from the public water supply. Freeport Water indicated that 100 Doxsee Drive, 72 Albany Avenue and 56 Mill Road do receive public water supply and are serviced by 2-inch, 3-inch and 3/4–inch water supply lines, respectively. Therefore, any wells present on these properties are likely not used for potable water.

GROUNDWATER SAMPLING

On March 29 and 30, 2018, AECOM collected groundwater samples from 15 monitoring wells in OU-2. All groundwater samples were analyzed for Target Compound List (TCL) volatile organic compounds (VOCs) by USEPA Method 8260C. Samples were collected using low-flow methods and were submitted to Eurofins–Lancaster Laboratories (New York Certification # 10670). Wells were purged and sampled using a peristaltic pump with polyethylene and silicon tubing. In addition, readings for temperature, pH, conductivity, dissolved oxygen (DO), and

redox potential were taken during purging of the wells. Groundwater sampling logs are presented in Appendix A.

In addition to the samples collected from the monitoring wells, field duplicate samples, field blanks and trip blanks were analyzed for quality control purposes. The field duplicate is a second sample collected from a selected well at the same time as the "parent" sample and submitted to the laboratory "blind" for analysis. The field blank (rinsate) was prepared by passing distilled water (opened in the field) through disposable polyethylene sample tubing and into laboratory-provided sample containers. Field blanks provide an additional check of possible sources of contamination from ambient air and sampling equipment. Due to quality assurance / quality control (QA/QC) issues described below, several wells were resampled on April 7, 2018 using the methods described above. The laboratory data packages are presented on a CD in Appendix B, and the data validation report is presented as Appendix C.

Regulatory Criteria

The groundwater sampling results are presented in Table 1. The results are compared to the NYSDEC Class GA Water Quality Standards (GWQS).

Data Quality Review

The laboratory data packages were subject to QA/QC review, and data usability summary reports (DUSRs) were prepared. The DUSRs are presented in Appendix C. No VOCs were detected at laboratory detection limits in the field blanks submitted with the samples, indicating that sampling equipment and methods did not introduce contaminants into the samples. If QA/QC issues were identified, the results were qualified as estimated; detections are qualified with a "J" and non-detections are qualified with a "UJ." The primary findings of the QA/QC review were:

Samples collected March 29 and 30, 2018

- Upon arrival at the laboratory, the temperature of the sample cooler was measured at 6.6 °C, which is above the acceptable range. All of the sample results were qualified as estimated "J" and "UJ".
- The percent difference (%D>20) between initial and continuing calibration for several VOCs was high. The affected results were qualified as estimated "UJ."
- Detections below the Reporting Limit are considered estimated and were flagged "J".
- Field and laboratory duplicate samples yielded acceptable accuracy.

Because of the issue with the sample temperature noted above, six of the wells were resampled on April 7. The results are presented in Table 1 with the March 29 and 30, 2018 results for comparison. The results for both sampling events are in very close agreement for each well, suggesting the elevated temperature of the samples did not adversely affect the analyses.

Samples collected April 7, 2018

- The percent difference (%D>20) between initial and continuing calibration for carbon tetrachloride was high. The affected results were qualified as estimated "UJ."
- The field duplicate of sample MW-09-19D was within acceptable control limits, with the exception of the chloroethane. The results for these two samples were qualified as estimated "J".

Overall the data quality is acceptable with the qualifications stated above. Further details are presented in the DUSRs in Appendix C.

RESULTS

OU-2

Volatile Organic Compounds

The OU-2 groundwater VOC sampling results are presented in Table 1 and shown on Figure 2. Samples were collected from 15 OU-2 monitoring wells. Chlorobenzene was detected in wells MW-09-19D (8.0 µg/l) and MW-09-26D (7.0 µg/l) at concentrations exceeding the GWQS of 5.0 µg/l. Chloroethane was detected in five OU-2 wells at concentrations ranging from 1.0 µg/l to 4.0 µg/l, but was not detected in any well at a concentration exceeding the GWQS of 5 µg/l. Acetone and 2-butanone were both detected in MW-09-20S at a concentration of 110 µg/l each, which exceeds their GWQS of 50 µg/l. Acetone and 2-butanone had not previously been detected in MW-09-20S at similar concentrations, and the source of these detections is unknown. Acetone and 2-butanone can be generated during fermentation of organic matter, but they are also common laboratory artifacts. No other VOCs were detected at levels over their respective GWQS. The source of the chlorobenzene impacts is unknown.

Field Measurements

Field measurements made at the conclusion of well purging are presented in Table 1. OU-2 pH values were all between 6.3 and 7.2, with the exception of MW-05-15D which was 4.03. The pH in this well was 3.80 in September 2017 and 3.86 in March 2017. The reason for this acidic pH is not known. The conductivity measurements in wells MW-09-25D and MW-17-29D were 21.34 millisiemens per centimeter (mS/cm) and 33.23 mS/cm, respectively, which is much higher than other wells sampled, but similar to readings from these wells in September 2017. The elevated conductivity could be related to the proximity of these wells to Freeport Creek. Other wells along Freeport Creek have exhibited high conductivity values in the past, possibly as a result of groundwater-surface water mixing. DO measurements in OU-2 wells were all less the

1.0 milligrams per liter (mg/l) with the exception of MW-09-19D (1.18 mg/l). Redox potential ranged from -197.1 milliVolts (mV) in MW-09-22S to 153.7 mV in MW-05-15D. The redox potential was measured at -492.8 mV in MW-17-27S, but that could be an instrument error because in three other sampling events, the redox potential in tat well was ranged from – 160 mV to -51 mV. The field measurements in some OU-2 wells are likely due, at least in part, to groundwater interaction with Freeport Creek surface water.

CONCLUSIONS AND RECOMMENDATIONS

Groundwater samples were collected from 15 monitoring wells in OU-2 in March 2018. From the results of this sampling event, the following conclusions can be drawn:

- The OU-2 groundwater VOC data shows that concentrations of spill-related compounds are non-detect to very low throughout OU-2 and detected concentrations are below their respective NYSDEC GWQS. The only compounds detected at concentrations above their GWQS were chlorobenzene, acetone and 2-butanone, which are not related to the OU-1 related to releases from OU-1.

- The temperatures of the March 28 – 29 samples were above acceptable levels upon receipt at the laboratory. However, several of the wells were resampled on April 7, and the results agreed with the qualified results, suggesting the temperature did not adversely affect the March sample results.

- All OU-2 properties receive water from Freeport Water, whose supply wells are located over a mile from the Site and are over 500 feet deep in a different aquifer.

Recommendations

On behalf of Burmah Castrol Holdings, Inc., AECOM presents the following recommendations for the Columbia Cement Company site:

1. Groundwater monitoring in OU-2 should continue as described in the OU-2 ROD and the same 15 wells should be sampled in September 2018. The number of wells to be sampled in future rounds should be re-evaluated following the two 2018 sampling rounds.

2. Selected OU-1 wells should be sampled in the near future to assess current groundwater conditions prior to implementing additional remedial measures. To coincide with OU-2 monitoring, a semi-annual groundwater VOC monitoring program will be established for OU-1 after remedial efforts are completed.

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Summary

In March 2018, 15 monitoring wells were sampled at OU-2 of the former Columbia Cement Company Site. The only exceedences of the GWQS detected in OU-2 were chlorobenzene, acetone and 2-butanone, which are not related to OU-1 releases. The OU-2 monitoring wells and selected OU-1 monitoring wells will be sampled in September 2018.

If you have any comments or questions, please contact me at (973) 883-8696 or by email at mark.becker@aecom.com.

Very truly yours,

AECOM

Mark T. Becker
Senior Geologist

MTB/mtb

cc: Scarlett McLaughlin, NYSDOH

Attachments:

Table 1	Summary of Groundwater Analytical Data, March – April 2018 – OU-2
Figure 1	Site Location Map
Figure 2	Site Plan with Groundwater VOC Sampling Results –OU-2
Appendix A	Groundwater Purge Logs
Appendix B	Laboratory Data Packages
Appendix C	Data Validation Reports

TABLES

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL DATA - MARCH-APRIL 2018
OPERABLE UNIT NO.2
COLUMBIA CEMENT SITE
FREEPORT, NEW YORK

SAMPLE ID	NYSDEC	MW-03-13S		MW-05-14S		MW-05-14S		MW-05-15D		MW-05-15D	
LAB SAMPLE ID	CLASS GA	9535637		9535639		9549087		9535638		9549088	
SAMPLE DATE	WATER	3/30/2018		3/30/2018		4/7/2018		3/30/2018		4/7/2018	
DILUTION FACTOR	QUAL. STD.	1		1		1		1		1	
UNITS	µg/l	µg/l		µg/l		µg/l		µg/l		µg/l	
Volatile Organic Compounds											
Acetone	50	6.0	UJ	6.0	UJ	6.0	U	6.0	UJ	6.0	U
Benzene	1	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
Bromodichloromethane	5	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
Bromoform	5	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
Bromomethane	5	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
2-Butanone	50	3.0	UJ	3.0	UJ	3.0	U	3.0	UJ	3.0	U
Carbon Disulfide	NE	1.0	UJ	1.0	UJ	1.0	U	12	J	11	
Carbon Tetrachloride	5	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	UJ
Chlorobenzene	5	0.50	UJ	4.0	J	2.0		0.50	UJ	0.50	U
Chloroethane	5	0.50	UJ	4.0	J	2.0		1.0	J	1.0	
Chloroform	7	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
Chloromethane	5	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
Cyclohexane	NE	2.0	UJ	2.0	UJ	2.0	U	2.0	UJ	2.0	U
1,2-Dibromo-3-chloropropane	NE	2.0	UJ	2.0	UJ	2.0	U	2.0	UJ	2.0	U
Dibromochloromethane	5	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
1,2-Dibromoethane	NE	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
1,2-Dichlorobenzene	0.6	1.0	UJ	1.0	UJ	1.0	U	1.0	UJ	1.0	U
1,3-Dichlorobenzene	NE	1.0	UJ	1.0	UJ	1.0	U	1.0	UJ	1.0	U
1,4-Dichlorobenzene	NE	1.0	UJ	1.0	UJ	1.0	U	1.0	UJ	1.0	U
Dichlorodifluoromethane	NE	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
1,1-Dichloroethane	5	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
1,2-Dichloroethane	0.6	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
1,1-Dichloroethene	5	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
cis-1,2-Dichloroethene	NE	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
trans-1,2-Dichloroethene	NE	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
1,2-Dichloropropane	1	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
cis-1,3-Dichloropropene	0.4	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
trans-1,3-Dichloropropene	0.4	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
Ethylbenzene	5	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
Freon 113		2.0	UJ	2.0	UJ	2.0	U	2.0	UJ	2.0	U
2-Hexanone	50	3.0	UJ	3.0	UJ	3.0	U	3.0	UJ	3.0	U
Isopropylbenzene	NE	1.0	UJ	1.0	UJ	1.0	U	1.0	UJ	1.0	U
Methyl Acetate	NE	1.0	UJ	1.0	UJ	1.0	U	1.0	UJ	1.0	U
Methyl Tertiary Butyl Ether	NE	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
4-Methyl-2-pentanone	NE	3.0	UJ	3.0	UJ	3.0	U	3.0	UJ	3.0	U
Methylcyclohexane	NE	1.0	UJ	1.0	UJ	1.0	U	1.0	UJ	1.0	U
Methylene Chloride	5	0.70	J	0.50	UJ	0.50	U	0.50	UJ	0.50	U
Styrene	5	1.0	UJ	1.0	UJ	1.0	U	1.0	UJ	1.0	U
1,1,2,2-Tetrachloroethane	5	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
Tetrachloroethene	5	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
Toluene	5	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
1,2,4-Trichlorobenzene	NE	1.0	UJ	1.0	UJ	1.0	U	1.0	UJ	1.0	U
1,1,1-Trichloroethane	5	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
1,1,2-Trichloroethane	1	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
Trichloroethene	5	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
Trichlorofluoromethane	NE	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
Vinyl Chloride	2	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
Xylene (Total)	5	0.50	UJ	0.50	UJ	0.50	U	0.50	UJ	0.50	U
Total Target VOCs	NE	0.70	J	8.0	J	4.0		13	J	12	
Field Measurments											
pH (s.u.)	NE	7.2		6.30		6.36		4.03		3.81	
Conductivity (mS/cm)	NE	0.248		3.632		3.740		6.750		9.02	
Dissolved Oxygen (mg/l)	NE	0.75		0.63		0.0		0.52		0.0	
Temperature (°C)	NE	13.74		12.40		10.63		14.79		12.15	
Redox Potential (mV)	NE	-118.9		-113.4		-45		153.7		189.0	

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL DATA - MARCH-APRIL 2018
OPERABLE UNIT NO.2
COLUMBIA CEMENT SITE
FREEPORT, NEW YORK

SAMPLE ID	NYSDEC	MW-09-18S	MW-09-18S	MW-09-19D	MW-09-19D	DUP040718	MW-09-20S
LAB SAMPLE ID	CLASS GA	9535634	9549086	9535635	9549085	9549091	9535631
SAMPLE DATE	WATER	3/30/2018	4/7/2018	3/30/2018	4/7/2018	4/7/2018	3/29/2018
DILUTION FACTOR	QUAL. STD.	1	1	1	1	1	1
UNITS	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
Volatile Organic Compounds							
Acetone	50	6.0 UJ	42	6.0 UJ	6.0 U	6.0 U	**110 J**
Benzene	1	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
Bromodichloromethane	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
Bromoform	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
Bromomethane	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
2-Butanone	50	3.0 UJ	3.0 U	3.0 UJ	3.0 U	3.0 U	**110 J**
Carbon Disulfide	NE	1.0 UJ	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 UJ
Carbon Tetrachloride	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
Chlorobenzene	5	3.0 J	2.0	**8.0** J	**7.0**	**7.0**	3.0 J
Chloroethane	5	0.50 UJ	0.50 U	2.0 J	2.0 J	1.0 J	0.50 UJ
Chloroform	7	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
Chloromethane	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
Cyclohexane	NE	2.0 UJ	2.0 U	2.0 UJ	2.0 U	2.0 U	2.0 UJ
1,2-Dibromo-3-chloropropane	NE	2.0 UJ	2.0 U	2.0 UJ	2.0 U	2.0 U	2.0 UJ
Dibromochloromethane	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
1,2-Dibromoethane	NE	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
1,2-Dichlorobenzene	0.6	1.0 UJ	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 UJ
1,3-Dichlorobenzene	NE	1.0 UJ	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 UJ
1,4-Dichlorobenzene	NE	1.0 J	1.0 U	2.0 J	2.0 J	2.0 J	1.0 UJ
Dichlorodifluoromethane	NE	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
1,1-Dichloroethane	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
1,2-Dichloroethane	0.6	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
1,1-Dichloroethene	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
cis-1,2-Dichloroethene	NE	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
trans-1,2-Dichloroethene	NE	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
1,2-Dichloropropane	1	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
cis-1,3-Dichloropropene	0.4	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
trans-1,3-Dichloropropene	0.4	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
Ethylbenzene	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
Freon 113		2.0 UJ	2.0 U	2.0 UJ	2.0 U	2.0 U	2.0 UJ
2-Hexanone	50	3.0 UJ	3.0 U	3.0 UJ	3.0 U	3.0 U	3.0 UJ
Isopropylbenzene	NE	1.0 UJ	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 UJ
Methyl Acetate	NE	1.0 UJ	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 UJ
Methyl Tertiary Butyl Ether	NE	1.0 J	0.8 J	6.0 J	5.0	5.0	0.50 UJ
4-Methyl-2-pentanone	NE	3.0 UJ	3.0 U	3.0 UJ	3.0 U	3.0 U	3.0 UJ
Methylcyclohexane	NE	1.0 UJ	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 UJ
Methylene Chloride	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	1.0 J
Styrene	5	1.0 UJ	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 UJ
1,1,2,2-Tetrachloroethane	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
Tetrachloroethene	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
Toluene	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
1,2,4-Trichlorobenzene	NE	1.0 UJ	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 UJ
1,1,1-Trichloroethane	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
1,1,2-Trichloroethane	1	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
Trichloroethene	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
Trichlorofluoromethane	NE	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
Vinyl Chloride	2	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
Xylene (Total)	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 UJ
Total Target VOCs	NE	5.0 J	44.0	18.0 J	16.0	15.0	224 J
Field Measurments							
pH (s.u.)	NE	6.69	6.57	6.70	6.61	NA	6.44
Conductivity (mS/cm)	NE	3.833	4.06	2.980	3.47	NA	1.656
Dissolved Oxygen (mg/l)	NE	0.95	0.0	1.18	0.0	NA	0.42
Temperature (°C)	NE	11.71	9.73	12.78	11.18	NA	15.59
Redox Potential (mV)	NE	7.2	-23	-77.9	-63	NA	20.7

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL DATA - MARCH-APRIL 2018
OPERABLE UNIT NO.2
COLUMBIA CEMENT SITE
FREEPORT, NEW YORK

SAMPLE ID	NYSDEC	MW-09-21D	MW-09-22S	MW-09-23D	MW-09-24S	MW-09-25D	DUP032918
LAB SAMPLE ID	CLASS GA	9535633	9535630	9535629	9535625	9535626	9535632
SAMPLE DATE	WATER	3/29/2018	3/29/2018	3/29/2018	3/29/2018	3/29/2018	3/29/2018
DILUTION FACTOR	QUAL. STD.	1	5	1	1	1	5
UNITS	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
Volatile Organic Compounds							
Acetone	50	6.0 UJ	6.0 UJ	6.0 UJ	6.0 UJ	6.0 UJ	6.0 UJ
Benzene	1	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Bromodichloromethane	5	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Bromoform	5	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Bromomethane	5	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
2-Butanone	50	3.0 UJ	3.0 UJ	3.0 UJ	3.0 UJ	3.0 UJ	3.0 UJ
Carbon Disulfide	NE	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Carbon Tetrachloride	5	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.5 UJ
Chlorobenzene	5	4.0 J	4.0 J	0.50 UJ	3.0 J	0.9 J	0.70 J
Chloroethane	5	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	3.0 J	3.0 J
Chloroform	7	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Chloromethane	5	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Cyclohexane	NE	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
1,2-Dibromo-3-chloropropane	NE	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Dibromochloromethane	5	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,2-Dibromoethane	NE	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,2-Dichlorobenzene	0.6	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
1,3-Dichlorobenzene	NE	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
1,4-Dichlorobenzene	NE	1.0 UJ	1.0 UJ	1.0 UJ	1.0 J	1.0 UJ	1.0 UJ
Dichlorodifluoromethane	NE	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,1-Dichloroethane	5	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,2-Dichloroethane	0.6	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,1-Dichloroethene	5	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
cis-1,2-Dichloroethene	NE	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
trans-1,2-Dichloroethene	NE	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,2-Dichloropropane	1	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
cis-1,3-Dichloropropene	0.4	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
trans-1,3-Dichloropropene	0.4	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Ethylbenzene	5	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Freon 113		2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
2-Hexanone	50	3.0 UJ	3.0 UJ	3.0 UJ	3.0 UJ	3.0 UJ	3.0 UJ
Isopropylbenzene	NE	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Methyl Acetate	NE	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Methyl Tertiary Butyl Ether	NE	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	1.0 J	0.80 J
4-Methyl-2-pentanone	NE	3.0 UJ	3.0 UJ	3.0 UJ	3.0 UJ	3.0 UJ	3.0 UJ
Methylcyclohexane	NE	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Methylene Chloride	5	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Styrene	5	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
1,1,2,2-Tetrachloroethane	5	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Tetrachloroethene	5	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Toluene	5	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,2,4-Trichlorobenzene	NE	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
1,1,1-Trichloroethane	5	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,1,2-Trichloroethane	1	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Trichloroethene	5	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Trichlorofluoromethane	NE	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Vinyl Chloride	2	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Xylene (Total)	5	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Total Target VOCs	NE	4.0 J	4.0 J	ND J	4.0 J	4.9 J	4.5 J
Field Measurments							
pH (s.u.)	NE	6.56	6.55	6.48	6.68	6.58	NA
Conductivity (mS/cm)	NE	1.549	4.799	1.893	2.208	21.34	NA
Dissolved Oxygen (mg/l)	NE	0.65	0.57	0.42	0.48	0.69	NA
Temperature (°C)	NE	15.43	15.02	13.92	13.15	13.39	NA
Redox Potential (mV)	NE	-129.6	-197.1	18.9	-59.9	20.5	NA

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL DATA - MARCH-APRIL 2018
OPERABLE UNIT NO.2
COLUMBIA CEMENT SITE
FREEPORT, NEW YORK

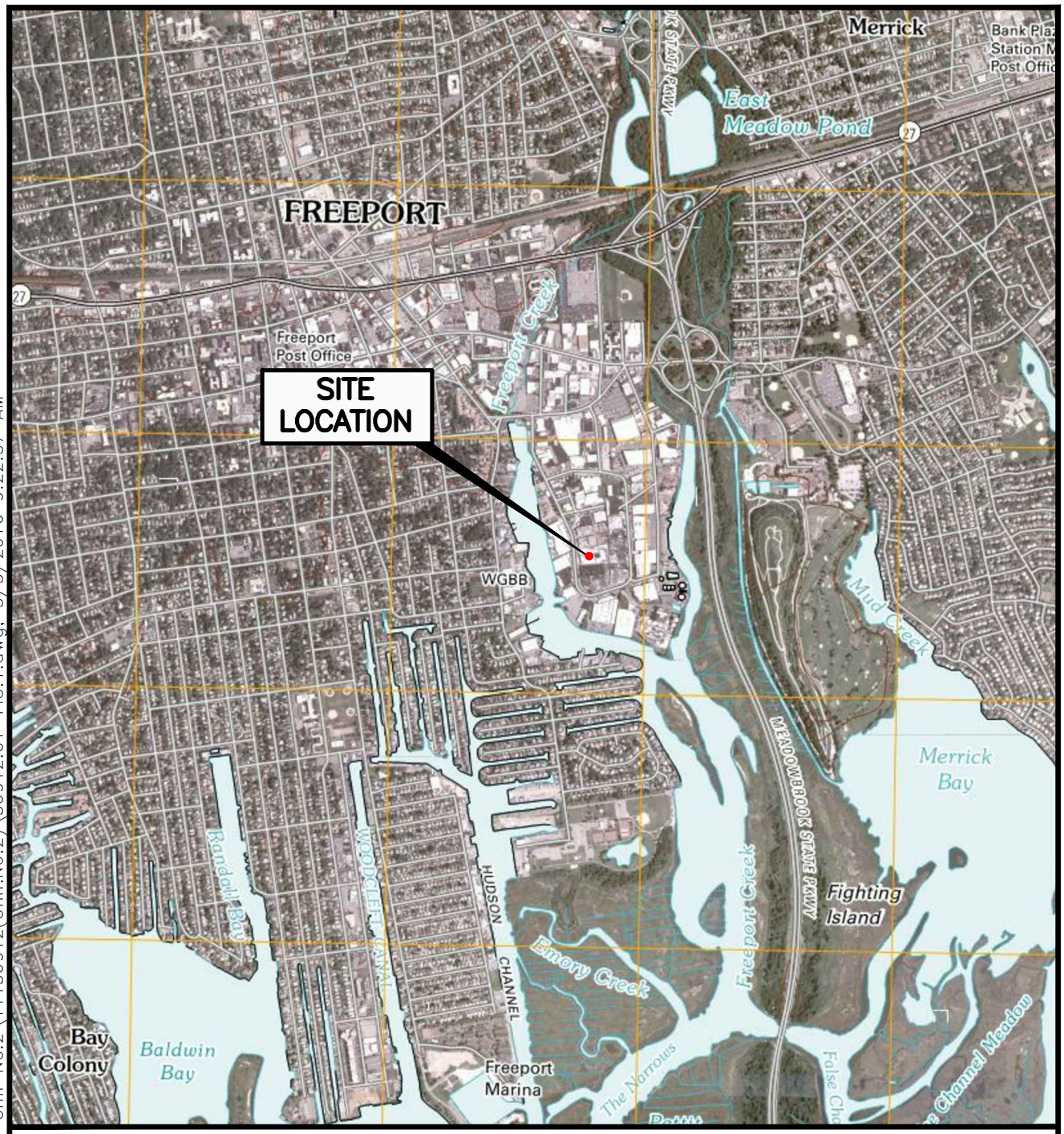
SAMPLE ID	NYSDEC	MW-09-26D	MW-09-26D	MW-07-27S	MW-17-27S	MW-17-28S	MW-17-29D
LAB SAMPLE ID	CLASS GA	9535623	9549090	9535624	9549089	9535627	9535628
SAMPLE DATE	WATER	3/29/2018	4/7/2018	3/29/2018	4/7/2018	3/29/2018	3/29/2018
DILUTION FACTOR	QUAL. STD.	1	1	1	1	1	1
UNITS	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
Volatile Organic Compounds							
Acetone	50	6.0 UJ	6.0 U	6.0 UJ	6.0 U	6.0 UJ	6.0 UJ
Benzene	1	0.50 UJ	0.50 U	0.60 J	0.90 J	0.50 UJ	0.50 UJ
Bromodichloromethane	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
Bromoform	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
Bromomethane	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
2-Butanone	50	3.0 UJ	3.0 U	3.0 UJ	3.0 U	3.0 UJ	3.0 UJ
Carbon Disulfide	NE	1.0 UJ	1.0 U	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ
Carbon Tetrachloride	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
Chlorobenzene	5	**7.0** J	**9.0**	0.50 UJ	0.50 U	5.0 J	0.50 UJ
Chloroethane	5	3.0 J	4.0	0.50 UJ	0.50 U	0.5 UJ	0.50 UJ
Chloroform	7	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
Chloromethane	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
Cyclohexane	NE	2.00 UJ	2.00 U	2.0 UJ	2.0 U	2.0 UJ	2.0 UJ
1,2-Dibromo-3-chloropropane	NE	2.0 UJ	2.0 U	2.0 UJ	2.0 U	2.0 UJ	2.0 UJ
Dibromochloromethane	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
1,2-Dibromoethane	NE	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
1,2-Dichlorobenzene	0.6	1.0 UJ	1.0 U	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ
1,3-Dichlorobenzene	NE	1.0 UJ	1.0 U	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ
1,4-Dichlorobenzene	NE	2.0 J	2.0 J	1.0 UJ	1.0 U	2.0 J	1.0 UJ
Dichlorodifluoromethane	NE	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
1,1-Dichloroethane	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
1,2-Dichloroethane	0.6	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
1,1-Dichloroethene	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
cis-1,2-Dichloroethene	NE	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
trans-1,2-Dichloroethene	NE	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
1,2-Dichloropropane	1	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
cis-1,3-Dichloropropene	0.4	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
trans-1,3-Dichloropropene	0.4	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
Ethylbenzene	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
Freon 113		2.0 UJ	2.0 U	2.0 UJ	2.0 U	2.0 UJ	2.0 UJ
2-Hexanone	50	3.0 UJ	3.0 U	3.0 UJ	3.0 U	3.0 UJ	3.0 UJ
Isopropylbenzene	NE	1.0 UJ	1.0 U	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ
Methyl Acetate	NE	1.0 UJ	1.0 U	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ
Methyl Tertiary Butyl Ether	NE	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
4-Methyl-2-pentanone	NE	3.0 UJ	3.0 U	3.0 UJ	3.0 U	3.0 UJ	3.0 UJ
Methylcyclohexane	NE	1.0 UJ	1.0 U	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ
Methylene Chloride	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
Styrene	5	1.0 UJ	1.0 U	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ
1,1,2,2-Tetrachloroethane	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
Tetrachloroethene	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
Toluene	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
1,2,4-Trichlorobenzene	NE	1.0 UJ	1.0 U	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ
1,1,1-Trichloroethane	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
1,1,2-Trichloroethane	1	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
Trichloroethene	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
Trichlorofluoromethane	NE	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
Vinyl Chloride	2	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
Xylene (Total)	5	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
Total Target VOCs	NE	12 J	15	0.60 J	0.90 J	7.0 J	ND
Field Measurments							
pH (s.u.)	NE	6.46	6.39	6.23	6.13	6.41	6.61
Conductivity (mS/cm)	NE	2.809	2.49	0.956	1.03	4.47	33.23
Dissolved Oxygen (mg/l)	NE	0.7	0	0.38	0	0.36	0.51
Temperature (°C)	NE	15.1	14.02	14.86	12.58	13.46	13.2
Redox Potential (mV)	NE	27.9	-70	-492.8	-51	19.9	-2

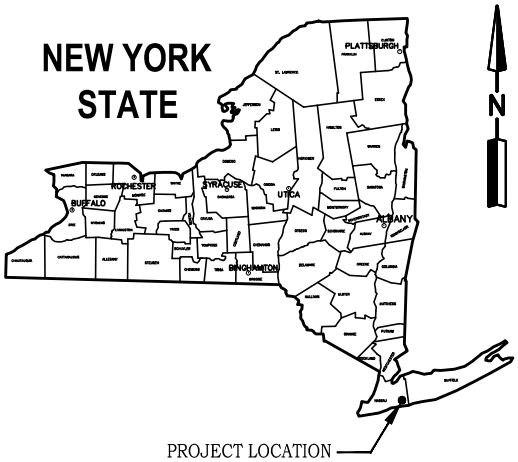
TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL DATA - MARCH-APRIL 2018
OPERABLE UNIT NO.2
COLUMBIA CEMENT SITE
FREEPORT, NEW YORK

NOTES:

U - Indicates compound was analyzed for but not detected
J - Indicates an estimated value due to limitations identified during the Quality Assurance (QA) review.
NS - Not sampled
ND - Not Detected
NE - No existing Groundwater Quality Standard
Total VOCs - This row presents the sum total concentration level of target compound list (TCL) volatile organic compounds (VOCs) reported in the sample.
Total VOC TICs - This row presents the sum total estimated concentration of non-target tentatively identified compounds.
100 (Bold) - Concentration exceeds NYSDEC Class GA Groundwater Quality Standard.
s.u. - Standard Units
mS/cm - milliSiemens per centimeter
mg/l - milligrams per liter
°C - Degrees celcius
mV - milliVolts

FIGURES





N

0 2000 4000

SCALE IN FEET

REFERENCE:
U.S.G.S. 7.5 MINUTE QUADRANGLE:
FREEPORT, NY (2010)

SITE LOCATION MAP
FORMER COLUMBIA CEMENT COMPANY, INC.
SITE NO. 130052
159 HANSE AVENUE
FREEPORT, NEW YORK

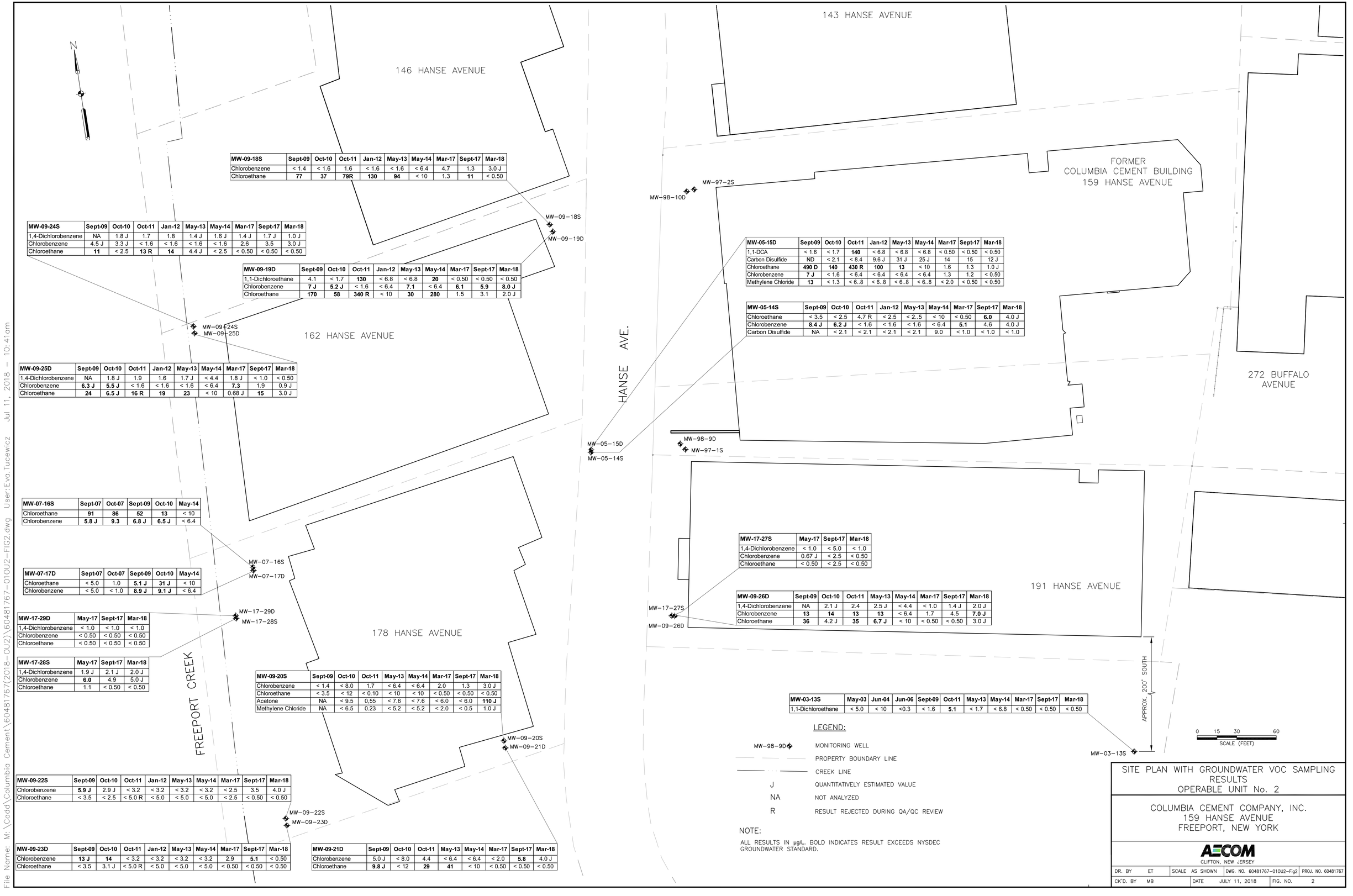
AECOM
1255 Broad Street
Clifton, New Jersey 07013
PHONE: (973) 883-8500
FAX: (973) 883-8501

DATE: 01/23/15

JOB: 11130912

FIGURE 1

K:\Cadd\Columbia Cement\Columbia Cement-Unit No.2\11130912(Unit.No.2)\30912.01-FIG.1.dwg, 5/5/2016 9:22:57 AM



MW-09-18S	Sept-09	Oct-10	Oct-11	Jan-12	May-13	May-14	Mar-17	Sept-17	Mar-18
Chlorobenzene	< 1.4	< 1.6	1.6	< 1.6	< 1.6	< 6.4	4.7	1.3	3.0 J
Chloroethane	**77**	**37**	**79R**	**130**	**94**	< 10	1.3	**11**	< 0.50

MW-09-24S	Sept-09	Oct-10	Oct-11	Jan-12	May-13	May-14	Mar-17	Sept-17	Mar-18
1,4-Dichlorobenzene	NA	1.8 J	1.7	1.8	1.4 J	1.6 J	1.4 J	1.7 J	1.0 J
Chlorobenzene	4.5 J	3.3 J	< 1.6	< 1.6	< 1.6	< 1.6	2.6	3.5	3.0 J
Chloroethane	**11**	< 2.5	**13 R**	**14**	4.4 J	< 2.5	< 0.50	< 0.50	< 0.50

MW-09-19D	Sept-09	Oct-10	Oct-11	Jan-12	May-13	May-14	Mar-17	Sept-17	Mar-18
1,1-Dichloroethane	4.1	< 1.7	**130**	< 6.8	< 6.8	**20**	< 0.50	< 0.50	< 0.50
Chlorobenzene	**7 J**	**5.2 J**	< 1.6	< 6.4	**7.1**	< 6.4	**6.1**	**5.9**	**8.0 J**
Chloroethane	**170**	**58**	**340 R**	< 10	**30**	**280**	1.5	3.1	2.0 J

MW-09-25D	Sept-09	Oct-10	Oct-11	Jan-12	May-13	May-14	Mar-17	Sept-17	Mar-18
1,4-Dichlorobenzene	NA	1.8 J	1.9	1.6	1.7 J	< 4.4	1.8 J	< 1.0	< 0.50
Chlorobenzene	**6.3 J**	**5.5 J**	< 1.6	< 1.6	< 1.6	< 6.4	**7.3**	1.9	0.9 J
Chloroethane	**24**	**6.5 J**	**16 R**	**19**	**23**	< 10	0.68 J	**15**	3.0 J

MW-05-15D	Sept-09	Oct-10	Oct-11	Jan-12	May-13	May-14	Mar-17	Sept-17	Mar-18
1,1-DCA	< 1.6	< 1.7	**140**	< 6.8	< 6.8	< 6.8	< 0.50	< 0.50	< 0.50
Carbon Disulfide	ND	< 2.1	< 8.4	9.6 J	31 J	25 J	14	15	12 J
Chloroethane	**490 D**	**140**	**430 R**	**100**	**13**	< 10	1.6	1.3	1.0 J
Chlorobenzene	**7 J**	< 1.6	< 6.4	< 6.4	< 6.4	< 6.4	1.3	1.2	< 0.50
Methylene Chloride	**13**	< 1.3	< 6..8	< 6..8	< 6..8	< 6..8	< 2.0	< 0.50	< 0.50

MW-05-14S	Sept-09	Oct-10	Oct-11	Jan-12	May-13	May-14	Mar-17	Sept-17	Mar-18
Chloroethane	< 3.5	< 2.5	4.7 R	< 2.5	< 2..5	< 10	< 0.50	**6.0**	4.0 J
Chlorobenzene	**8.4 J**	**6.2 J**	< 1.6	< 1.6	< 1.6	< 6.4	**5.1**	4.6	4.0 J
Carbon Disulfide	NA	< 2.1	< 2.1	< 2.1	< 2.1	9.0	< 1.0	< 1.0	< 1.0

MW-07-16S	Sept-07	Oct-07	Sept-09	Oct-10	May-14
Chloroethane	**91**	**86**	**52**	**13**	< 10
Chlorobenzene	**5.8 J**	**9.3**	**6.8 J**	**6.5 J**	< 6.4

MW-07-17D	Sept-07	Oct-07	Sept-09	Oct-10	May-14
Chloroethane	< 5.0	1.0	**5.1 J**	**31 J**	< 10
Chlorobenzene	< 5.0	< 1.0	**8.9 J**	**9.1 J**	< 6.4

MW-17-29D	May-17	Sept-17	Mar-18
1,4-Dichlorobenzene	< 1.0	< 1.0	< 1.0
Chlorobenzene	< 0.50	< 0.50	< 0.50
Chloroethane	< 0.50	< 0.50	< 0.50

MW-17-28S	May-17	Sept-17	Mar-18
1,4-Dichlorobenzene	1.9 J	2.1 J	2.0 J
Chlorobenzene	**6.0**	4.9	5.0 J
Chloroethane	1.1	< 0.50	< 0.50

MW-09-20S	Sept-09	Oct-10	Oct-11	May-13	May-14	Mar-17	Sept-17	Mar-18
Chlorobenzene	< 1.4	< 8.0	1.7	< 6.4	< 6.4	2.0	1.3	3.0 J
Chloroethane	< 3.5	< 12	< 0.10	< 10	< 10	< 0.50	< 0.50	< 0.50
Acetone	NA	< 9.5	0,55	< 7.6	< 7.6	< 6.0	< 6.0	**110 J**
Methylene Chloride	NA	< 6.5	0.23	< 5.2	< 5.2	< 2.0	< 0.5	1.0 J

MW-09-22S	Sept-09	Oct-10	Oct-11	Jan-12	May-13	May-14	Mar-17	Sept-17	Mar-18
Chlorobenzene	**5.9 J**	2.9 J	< 3.2	< 3.2	< 3.2	< 3.2	< 2.5	3.5	4.0 J
Chloroethane	< 3.5	< 2.5	< 5.0 R	< 5.0	< 5.0	< 5.0	< 2.5	< 0.50	< 0.50

MW-09-23D	Sept-09	Oct-10	Oct-11	Jan-12	May-13	May-14	Mar-17	Sept-17	Mar-18
Chlorobenzene	**13 J**	**14**	< 3.2	< 3.2	< 3.2	< 3.2	2.9	**5.1**	< 0.50
Chloroethane	< 3.5	3.1 J	< 5.0 R	< 5.0	< 5.0	< 5.0	< 0.50	< 0.50	< 0.50

MW-09-21D	Sept-09	Oct-10	Oct-11	May-13	May-14	Mar-17	Sept-17	Mar-18
Chlorobenzene	5.0 J	< 8.0	4.4	< 6.4	< 6.4	< 2.0	**5.8**	4.0 J
Chloroethane	**9.8 J**	< 12	**29**	**41**	< 10	< 0.50	< 0.50	< 0.50

MW-17-27S	May-17	Sept-17	Mar-18
1,4-Dichlorobenzene	< 1.0	< 5.0	< 1.0
Chlorobenzene	0.67 J	< 2.5	< 0.50
Chloroethane	< 0.50	< 2.5	< 0.50

MW-09-26D	Sept-09	Oct-10	Oct-11	May-13	May-14	Mar-17	Sept-17	Mar-18
1,4-Dichlorobenzene	NA	2.1 J	2.4	2.5 J	< 4.4	< 1.0	1.4 J	2.0 J
Chlorobenzene	**13**	**14**	**13**	**13**	< 6.4	1.7	4.5	**7.0 J**
Chloroethane	**36**	4.2 J	**35**	**6.7 J**	< 10	< 0.50	< 0.50	3.0 J

MW-03-13S	May-03	Jun-04	Jun-06	Sept-09	Oct-11	May-13	May-14	Mar-17	Sept-17	Mar-18
1,1-Dichloroethane	< 5.0	< 10	<0.3	< 1.6	**5.1**	< 1.7	< 6.8	< 0.50	< 0.50	< 0.50

LEGEND:

MW-98-9D	MONITORING WELL
	PROPERTY BOUNDARY LINE
	CREEK LINE
J	QUANTITATIVELY ESTIMATED VALUE
NA	NOT ANALYZED
R	RESULT REJECTED DURING QA/QC REVIEW

NOTE:

ALL RESULTS IN µg/L. BOLD INDICATES RESULT EXCEEDS NYSDEC GROUNDWATER STANDARD.

SITE PLAN WITH GROUNDWATER VOC SAMPLING RESULTS OPERABLE UNIT No. 2

COLUMBIA CEMENT COMPANY, INC.
159 HANSE AVENUE
FREEPORT, NEW YORK

AECOM
CLIFTON, NEW JERSEY

DR. BY	ET	SCALE	AS SHOWN	DWG. NO.	60481767-010U2-Fig2	PROJ. NO.	60481767
CK'D. BY	MB	DATE	JULY 11, 2018	FIG. NO.	2		

File Name: M:\Cadd\Columbia Cement\60481767(2018-OU2)\60481767-010U2-FIG2.dwg User:Eva.Tucewicz Jul 11, 2018 - 10:41am

APPENDIX A
GROUNDWATER PURGE LOGS

MW-03-135

URS CORPORATION

Site Name: Columbia Cement

LOW FLOW RATE PURGING AND SAMPLING DATA SHEET

DATE: 3/30/18 **SHEET** 1 **OF** 1

WEATHER: Rain, 30s **FIELD PERSONNEL:** SC/CB

MONITORING WELL NO.: **WELL PERMIT NUMBER:**

PID/FID READINGS (ppm): **AMBIENT AIR:** — **PUMP INTAKE DEPTH:** _____ ft from top of casing (TOC)

OPEN WELL (Initial): — **WATER ELEVATION WITH PUMP IN PLACE (Initial):** 4.99 ft from TOC

WQ Meter Cert No. _____ **PUMP START TIME:** _____

TIME	Purging	Sampling	pH (pH units) Reading	pH (pH units) Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity (mS/cm) %**	Redox Potential (mv) Reading	Redox Potential (mv) Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen (mg/L) %****	Turbidity (NTU) Reading	Turbidity (NTU) %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
915	X		7.26	NA	0.246	NA	-111.7	NA	0.84	NA	24.3	NA	13.62	NA	NA	4.99
920	X		7.24		0.246		-112.9		0.79		23.9		13.61		200	5.00
925	X		7.23		0.246		-113.4		0.72		23.4		13.60		↓	↓
930	X		7.21		0.247		-116.8		0.74		22.1		13.69			
935	X		7.20		0.248		-117.4		0.75		21.5		13.72			
940	X		7.20		0.248		-118.9		0.75		21.4		13.74		↓	↓
945		X	← sample time →													

Sampling Equipment and Laboratory Analysis:

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

(MW-05745)

URS CORPORATION

Site Name: Columbia Cement

LOW FLOW RATE PURGING AND SAMPLING DATA SHEET

DATE: 5/30/18 **SHEET** 1 **OF** 1

WEATHER: Rain, 30s **FIELD PERSONNEL:** SSLC

MONITORING WELL NO.: **WELL PERMIT NUMBER:**

PID/FID READINGS (ppm): **AMBIENT AIR:** —

OPEN WELL (Initial): —

WQ Meter Cert No. —

PUMP INTAKE DEPTH: — ft from top of casing (TOC)

WATER ELEVATION WITH PUMP IN PLACE (Initial): 6.70 ft from TOC

PUMP START TIME: —

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity %**	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
1000	X		6.32	NA	3.447	NA	-122.7	NA	0.82	NA	100.7	NA	12.39	NA	NA	6.70
1005	X		6.32		3.450		-121.0		0.76		167.7		12.41		200	6.75
1010	X		6.31		3.500		-120.3		0.72		217.6		12.49		↓	
1015	X		6.30		3.549		-111.0		0.67		239.7		12.44			
1020	X		6.30		3.601		-112.7		0.65		240.1		12.42			
1025	X		6.30		3.632		-113.4		0.63		241.8		12.40		↓	↓
1030		X	Sample time													

Sampling Equipment and Laboratory Analysis: —

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

URS CORPORATION

Site Name: Columbia Cement

LOW FLOW RATE PURGING AND SAMPLING DATA SHEET

DATE: 5/30/18 SHEET 1 OF 1

WEATHER: Rain 30s FIELD PERSONNEL: C. Dallavin

MONITORING WELL NO.: MW-05-150 WELL PERMIT NUMBER:

PID/FID READINGS (ppm): AMBIENT AIR: — PUMP INTAKE DEPTH: _____ ft from top of casing (TOC)

OPEN WELL (Initial): — WATER ELEVATION WITH PUMP IN PLACE (Initial): 4.63 ft from TOC

WQ Meter Cert No. _____ PUMP START TIME: _____

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity %**	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
10:00			3.99	NA	6.625	NA	155.4	NA	0.95	NA	55.9	NA	14.36	NA	NA	4.63
10:05			4.01		6.587		154.5		0.77		58.0		14.33		200	4.40
10:10			4.02		6.562		153.8		0.64		44.5		14.43		200	4.43
10:15			4.03		6.623		153.7		0.56		25.5		14.64		200	4.43
10:20			4.03		6.693		153.7		0.50		18.3		14.72		200	4.43
10:25			4.03		6.734		153.7		0.47		16.1		14.74		200	4.43
10:30			4.03		6.750		153.7		0.52		14.2		14.79		200	4.43

Sampling Equipment and Laboratory Analysis: _____

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

URS CORPORATION

Site Name: Columbia Cement

LOW FLOW RATE PURGING AND SAMPLING DATA SHEET

DATE: 3/30/18 **SHEET** 1 **OF** 1

WEATHER: Rain, 30s **FIELD PERSONNEL:** ES/CD

MONITORING WELL NO.: MW-09-18S **WELL PERMIT NUMBER:**

PID/FID READINGS (ppm): **AMBIENT AIR:** — **PUMP INTAKE DEPTH:** _____ ft from top of casing (TOC)

OPEN WELL (Initial): — **WATER ELEVATION WITH PUMP IN PLACE (Initial):** 6.03 ft from TOC

WQ Meter Cert No. _____ **PUMP START TIME:** _____

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity %**	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
8:10			6.72	NA	3.744	NA	5.6	NA	4.13	NA	35.0	NA	11.65	NA	NA	6.03
8:15			6.70		3.824		6.7		1.33		16.4		11.67		200	5.60
8:20			6.69		3.830		7.0		0.89		12.3		11.71		200	5.65
8:25			6.69		3.835		7.1		1.17		11.6		11.70		200	5.65
8:30			6.69		3.837		7.2		0.95		11.0		11.69		200	5.65
8:35			6.69		3.832		7.3		0.97		8.4		11.76		200	5.65
8:40			6.69		3.833		7.2		0.95		8.9		11.71		200	5.65

Sampling Equipment and Laboratory Analysis: _____

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

MW-09-19D

URS CORPORATION

Site Name: Columbia Cement

LOW FLOW RATE PURGING AND SAMPLING DATA SHEET

DATE: 5/2/18 **SHEET** 1 **OF** 1

WEATHER: Rain 30s **FIELD PERSONNEL:** SB/CD

MONITORING WELL NO.: **WELL PERMIT NUMBER:**

PID/FID READINGS (ppm): **AMBIENT AIR:** — **PUMP INTAKE DEPTH:** _____ ft from top of casing (TOC)

OPEN WELL (Initial): — **WATER ELEVATION WITH PUMP IN PLACE (Initial):** 5.97 ft from TOC

WQ Meter Cert No. _____ **PUMP START TIME:** _____

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity %**	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
815	X		6.71	NA	2.990	NA	-70.6	NA	1.29	NA	0.9	NA	12.67	NA	NA	5.97
820	X		6.70		2.988		-72.3		1.28		0.0		12.68		746	5.98
825	X		6.70		2.988		-73.4		1.27		0.0		12.69			
830	X		6.70		2.986		-74.9		1.25		0.0		12.70			
835	X		6.71		2.985		-77.5		1.22		0.0		12.73			
840	X		6.70		2.980		-77.7		1.19		0.0		12.75			
845	X		6.70		2.980		-72.9		1.18		0.0		12.78			
850		X				Sample time										

Sampling Equipment and Laboratory Analysis:

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

FD033018@(0800) 5/10/18

URS CORPORATION

Site Name: Columbia Cement

LOW FLOW RATE PURGING AND SAMPLING DATA SHEET

DATE: 3/29/18 SHEET 1 OF 1

WEATHER: Rain, 30s FIELD PERSONNEL: C. Dunham

MONITORING WELL NO.: MW-09-20S WELL PERMIT NUMBER:

PID/FID READINGS (ppm): AMBIENT AIR: — PUMP INTAKE DEPTH: _____ ft from top of casing (TOC)

OPEN WELL (Initial): — WATER ELEVATION WITH PUMP IN PLACE (Initial): 30.10 ft from TOC

WQ Meter Cert No. _____ PUMP START TIME: _____

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity %**	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
13:00			6.41	NA	1.770	NA	22.7	NA	0.89	NA	18.3	NA	15.65	NA	NA	8.10
13:05			6.43		1.720		21.8		0.56		17.3		15.56		200	8.10
13:10			6.43		1.695		21.5		0.62		20.5		15.51		200	7.85
13:15			6.44		1.679		20.9		0.46		12.1		15.56		200	7.85
13:20			6.44		1.664		20.8		0.42		9.5		15.60		200	7.76
13:25			6.44		1.660		20.8		0.40		9.4		15.60		200	7.72
13:30			6.44		1.656		20.7		042		9.0		15.59		200	7.69

Sampling Equipment and Laboratory Analysis: _____

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

3/29/10
MW-09-21D

URS CORPORATION

Site Name: Columbia Cement

LOW FLOW RATE PURGING AND SAMPLING DATA SHEET

DATE: _____ SHEET 1 OF 1

WEATHER: Rain, 30s FIELD PERSONNEL: SS/ED

MONITORING WELL NO.: WELL PERMIT NUMBER:

PID/FID READINGS (ppm): AMBIENT AIR: — PUMP INTAKE DEPTH: _____ ft from top of casing (TOC)

OPEN WELL (Initial): — WATER ELEVATION WITH PUMP IN PLACE (Initial): 7.27 ft from TOC

WQ Meter Cert No. _____ PUMP START TIME: _____

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity %**	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
1305	X		6.55	NA	1.962	NA	-120.3	NA	1.01	NA	4.9	NA	15.42	NA	NA	7.27
1310	X		6.56		1.769		-117.3		0.92		6.7		15.31		200	7.31
1315	X		6.54		1.679		-120.7		0.51		6.3		15.37		↓	7.33
1320	X		6.55		1.631		-121.4		0.38		6.0		15.40			↓
1325	X		6.56		1.552		-127.3		0.66		4.8		15.42			
1330	X		6.56		1.550		-128.4		0.65		4.8		15.42			
1335	X		6.58		1.549		-129.6		0.65		4.7		15.43		↓	↓
1340		X	"	"	"	"	"	"	"	"	"	"	"			

Sampling Equipment and Laboratory Analysis: _____

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

MW-09-22S

URS CORPORATION

Site Name: Columbia Cement

LOW FLOW RATE PURGING AND SAMPLING DATA SHEET

DATE: 7/29/15 **SHEET** 1 **OF** 1

WEATHER: Rain, 70s **FIELD PERSONNEL:** SS / CD

MONITORING WELL NO.: **WELL PERMIT NUMBER:**

PID/FID READINGS (ppm): **AMBIENT AIR:** — **PUMP INTAKE DEPTH:** _____ ft from top of casing (TOC)

OPEN WELL (Initial): — **WATER ELEVATION WITH PUMP IN PLACE (Initial):** 7.39 ft from TOC

WQ Meter Cert No. _____ **PUMP START TIME:** _____

TIME	Purging	Sampling	pH (pH units) Reading	pH (pH units) Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity (mS/cm) %**	Redox Potential (mv) Reading	Redox Potential (mv) Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen (mg/L) %****	Turbidity (NTU) Reading	Turbidity (NTU) %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
1155	X		6.53	NA	5.960	NA	-199.7	NA	0.60	NA	14.9	NA	14.89	NA	NA	7.39
1200	X		6.55		5.098		-198.3		0.59		13.0		14.91		200	7.41
1205	X		6.55		4.937		-195.1		0.58		17.3		14.97			7.49
1210	X		6.55		4.787		-194.7		0.53		10.4		15.11			
1215	X		6.55		4.791		-194.8		0.53		5.8		15.01			
1220	X		6.55		4.793		-193.7		0.57		5.3		15.01			
1225	X		6.55		4.799		-192.1		0.57		5.0		15.02		↓	↓
1230		X				SAMPLE TIME										

Sampling Equipment and Laboratory Analysis: _____

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

URS CORPORATION

Site Name: Columbia Cement

LOW FLOW RATE PURGING AND SAMPLING DATA SHEET

DATE: 3/29/18 SHEET 1 OF 1

WEATHER: Cloudy/Rain 40 FIELD PERSONNEL: C. DeMarvin

MONITORING WELL NO.: MW-09-23D WELL PERMIT NUMBER:

PID/FID READINGS (ppm): AMBIENT AIR: _____ PUMP INTAKE DEPTH: _____ ft from top of casing (TOC)

OPEN WELL (Initial): _____ WATER ELEVATION WITH PUMP IN PLACE (Initial): 7.01 ft from TOC

WQ Meter Cert No. _____ PUMP START TIME: _____

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity %**	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
11:55			6.49	NA	1.896	NA	18.4	NA	0.98	NA	58.1	NA	13.42	NA	NA	7.01
12:00			6.48		1.887		18.7		0.65		63.6		13.53		200	7.01
12:05			6.48		1.888		18.8		0.58		55.9		13.61		200	7.00
12:10			6.48		1.890		18.7		0.48		35.7		13.80		200	7.00
12:15			6.48		1.892		18.8		0.48		33.5		13.86		200	7.00
12:20			6.48		1.892		18.9		0.44		31.2		13.92		200	7.00
12:25			6.48		1.893		18.9		0.42		28.5		13.92		200	7.00

Sampling Equipment and Laboratory Analysis:

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

MW-09-24S

URS CORPORATION

Site Name: Columbia Cement

3/29/18

LOW FLOW RATE PURGING AND SAMPLING DATA SHEET

DATE: _____ SHEET 1 OF 1

WEATHER: (Rain) 30s FIELD PERSONNEL: SC/CD

MONITORING WELL NO.: WELL PERMIT NUMBER:

PID/FID READINGS (ppm): AMBIENT AIR: — PUMP INTAKE DEPTH: _____ ft from top of casing (TOC)

OPEN WELL (Initial): — WATER ELEVATION WITH PUMP IN PLACE (Initial): 3.57 ft from TOC

WQ Meter Cert No. _____ PUMP START TIME: _____

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity %**	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
945	X		6.73	NA	2.127	NA	-49.1	NA	0.89	NA	26.8	NA	12.89	NA	NA	3.57
950	X		6.70		2.057		-50.1		0.86		25.4		12.91		2.00	3.58
955	X		6.69		2.059		-54.0		0.74		22.4		13.06		↓	↓
1000	X		6.68		2.218		-56.7		0.51		19.7		13.12			
1005	X		6.68		2.210		-58.2		0.50		18.8		13.14			
1010	X		6.68		2.207		-59.9		0.48		18.0		13.15		↓	↓
1015		X														

Sampling Equipment and Laboratory Analysis: _____

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

URS CORPORATION

Site Name: Columbia Cement

LOW FLOW RATE PURGING AND SAMPLING DATA SHEET

DATE: 3/29/18 SHEET 1 OF 1

WEATHER: [redacted] Rain 50s FIELD PERSONNEL: C. Dittmar

MONITORING WELL NO.: MW-09-25D WELL PERMIT NUMBER:

PID/FID READINGS (ppm): AMBIENT AIR: — PUMP INTAKE DEPTH: _____ ft from top of casing (TOC)

OPEN WELL (Initial): — WATER ELEVATION WITH PUMP IN PLACE (Initial): 4.53 ft from TOC

WQ Meter Cert No. _____ PUMP START TIME: _____

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity %**	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
9:55			6.66	NA	24.31	NA	16.9	NA	1.49	NA	123.7	NA	12.78	NA	NA	4.53
10:00			6.58		21.81		20.4		1.04		21.2		13.28		200	4.53
10:05			6.58		21.63		20.1		0.82		18.3		13.33		200	4.53
10:10			6.58		21.50		20.4		0.80		18.1		13.32		200	4.53
10:15			6.58		21.42		20.4		0.75		15.3		13.35		200	4.60
10:20			6.58		21.38		20.5		0.70		14.4		13.39		200	4.63
10:25			6.58		21.34		20.5		0.69		14.9		13.39		200	4.63

Sampling Equipment and Laboratory Analysis: _____

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

DUP032918 @ 16:00 collected at this

360

URS CORPORATION

Site Name: Columbia Cement

LOW FLOW RATE PURGING AND SAMPLING DATA SHEET

DATE: 3/29/18
WEATHER: Rain, 30s
MONITORING WELL NO.: ~~MW-~~ 09-28D WELL PERMIT NUMBER:
SHEET 1 OF 1
FIELD PERSONNEL: C. Dettmann / S.S

PID/FID READINGS (ppm): AMBIENT AIR: —
OPEN WELL (Initial): —
WQ Meter Cert No. _____
PUMP INTAKE DEPTH: _____ ft from top of casing (TOC)
WATER ELEVATION WITH PUMP IN PLACE (Initial): 5.43 ft from TOC
PUMP START TIME: 8:55

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity % **	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
8:55			6.46	NA	2.910	NA	27.3	NA	0.99	NA	3.9	NA	14.93	NA	NA	5.43
9:00			6.46		2.858		27.6		0.81		4.8		14.84		200	5.43
9.05			6.45		2.828		27.7		0.98		1.5		15.02		200	5.43
9:10			6.45		2.842		27.8		0.66		-0.7		15.07		200	5.43
9:15			6.45		2.870		28.0		0.63		1.1		15.07		200	5.43
9:20			6.44		2.822		28.1		0.67		2.0		15.09		200	5.43
9.25			6.44		2.807		27.9		0.70		1.6		15.10		200	5.43

Sampling Equipment and Laboratory Analysis: _____

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

MW-17-27S

URS CORPORATION

Site Name: Columbia Cement

LOW FLOW RATE PURGING AND SAMPLING DATA SHEET

DATE: 3/29/18 **SHEET** 1 **OF** 1

WEATHER: Rain, 30s **FIELD PERSONNEL:** SS/CD

MONITORING WELL NO.: **WELL PERMIT NUMBER:**

PID/FID READINGS (ppm): **AMBIENT AIR:** _____ **PUMP INTAKE DEPTH:** _____ ft from top of casing (TOC)

OPEN WELL (Initial): _____ **WATER ELEVATION WITH PUMP IN PLACE (Initial):** 5.32 ft from TOC 20.2 DTB

WQ Meter Cert No. _____ **PUMP START TIME:** _____

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity %**	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
0855	X		6.72	NA		NA	-479.1	NA	0.52	NA	20.9	NA	14.79	NA	NA	5.32
0900	X		6.23		0.969		-494.2		0.52		19.7		14.80		200	
905	X		6.23		0.960		-495.4		0.47		21.1		14.85			
910	X		6.23		0.959		-495.8		0.41		25.4		14.86			
915	X		6.23		0.958		-498.7		0.40		21.2		14.88			
920	X		6.23		0.957		-491.2		0.39		20.1		14.35			
925	X		6.23		0.957		-492.3		0.38		19.8		14.86			
930	X		6.23		0.956		-492.8		0.38		18.9		14.86		↓	↓
935		X														

Sampling Equipment and Laboratory Analysis: tubing in well

TCL VOCs / 1,4 Dioxane

(8260B+D)

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

URS CORPORATION

Site Name: Columbia Cement

LOW FLOW RATE PURGING AND SAMPLING DATA SHEET

DATE: 3/29/18 SHEET 1 OF 1

WEATHER: Rain, 30s FIELD PERSONNEL: SS/CD

MONITORING WELL NO.: MW-17-285 WELL PERMIT NUMBER:

PID/FID READINGS (ppm): AMBIENT AIR: — PUMP INTAKE DEPTH: _____ ft from top of casing (TOC)

OPEN WELL (Initial): _____ WATER ELEVATION WITH PUMP IN PLACE (Initial): 6.89 ft from TOC

WQ Meter Cert No. _____ PUMP START TIME: _____

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity %**	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
10:55			6.36	NA	6.217	NA	24.8	NA	1.30	NA	2.8	NA	13.75	NA	NA	6.89
11:00			6.39		5.307		23.3		0.75		3.2		13.47		200	6.89
11:05			6.41		4.629		22.6		0.62		3.9		13.46		200	6.89
11:10			6.41		4.529		21.1		0.54		3.6		13.48		200	6.89
11:15			6.40		4.463		20.8		0.44		3.4		13.46		200	6.89
11:20			6.41		4.479		20.6		0.39		3.5		13.45		200	6.89
11:25			6.41		4.470		19.9		0.36		3.7		13.46		200	6.89

Sampling Equipment and Laboratory Analysis: _____

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

MW-17-29D

URS CORPORATION

Site Name: Columbia Cement

LOW FLOW RATE PURGING AND SAMPLING DATA SHEET

DATE: 3/29/18 **SHEET** 1 **OF** 1

WEATHER: Rain, 30s **FIELD PERSONNEL:** CS/CD

MONITORING WELL NO.: **WELL PERMIT NUMBER:**

PID/FID READINGS (ppm): **AMBIENT AIR:** — **PUMP INTAKE DEPTH:** _____ ft from top of casing (TOC)

OPEN WELL (Initial): — **WATER ELEVATION WITH PUMP IN PLACE (Initial):** 6.40 ft from TOC

WQ Meter Cert No. _____ **PUMP START TIME:** _____

TIME	Purging	Sampling	pH (pH units) Reading	pH (pH units) Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity (mS/cm) %**	Redox Potential (mv) Reading	Redox Potential (mv) Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen (mg/L) %****	Turbidity (NTU) Reading	Turbidity (NTU) %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
1100	X		6.63	NA	33.53	NA	-745.1	NA	0.80	NA	16.8	NA	13.20	NA	NA	6.43
1105	X		6.62		33.43		-758.3		0.74		10.0		13.20		200	6.42
1110	X		6.61		33.29		-766.3		0.53		3.2		13.19			
1115	X		6.61		33.28		-7		0.52		3.4		13.20			
1120	X		6.61		33.27		-2		0.51		3.7		13.20			
1125		X			Sample time											

Sampling Equipment and Laboratory Analysis:

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

APPENDIX B
LABORATORY DATA PACKAGES (ON CD)

APPENDIX C
DATA VALIDATION REPORTS

DATA VALIDATION REVIEW
PROJECT: COLUMBIA CEMENT, FREEPORT, LONG ISLAND, NY
DATE SAMPLES COLLECTED: MARCH 29 THROUGH 30, 2018
JOB NO.: 60481767

LAB REPORT NO. 9535623-9535639

1.0 INTRODUCTION

This Data Validation Review has been performed in accordance with the requirements specified in the standard operating procedures for the validation of USEPA Low/Medium Volatile Data Validation, SOP No. HW-33, Revision 3, dated March 2013. The quality assurance review requirements are applied such that specifications of the methods take precedence over the specifications of the USEPA Region II data review guidelines in those instances where the specifications differ.

The objective of the review was to assess data usability and compliance with New York State Department of Environmental Conservation (NYSDEC) ASP Category B deliverable requirements. The Data Validation Review provides an interpretation of data usability based on the reported quality control parameters. A total of 15 water samples, 1 field duplicate samples and 1 field blank sample were collected by AECOM, Clifton, New Jersey, office personnel and submitted to Eurofins Lancaster Laboratories Environmental (NYSDEC Certification No. 10670). Section 2.0 of this report summarizes the samples included in this review and the analyses performed. The groundwater samples were analyzed following USEPA CLP and Standard Methodologies. The laboratory analytical data set contained herein was prepared in accordance with NYSDEC ASP Category B Data Deliverable Format (Exhibit B).

The organic data quality review is based on the following parameters:

* Hold Times
* Blank Contamination
* GC/MS Performance Check (Tuning) Summaries
* System Monitoring Compound (Surrogate) Recoveries
* Internal Standard Area Performance
  Initial and Continuing Calibration Results
  Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Summaries
* Target Compound Identification and Quantitation

*All criteria were met for this parameter

This report was prepared to provide a critical review of the laboratory analysis and reported chemical results. Overall, the data quality is acceptable. The results of the Data Validation Review are presented in Section 3.0. Data qualifiers, when applicable, are placed next to the results so that the data user can assess the qualitative and/or quantitative reliability of the reported result.

2.0 SAMPLES INCLUDED IN REVIEW

Lab Report No. 9535623-9535639

Sample ID	Lab ID	Date Collected	Test Requested
MW-09-28D	9535623	3/29/18	VOA
MW-07-27S	9535624	3/29/18	VOA
MW-09-24S	9535625	3/29/18	VOA
MW-09-25D	9535626	3/29/18	VOA
MW-17-28S	9535627	3/29/18	VOA
MW-17-29D	9535628	3/29/18	VOA
MW-09-23D	9535629	3/29/18	VOA
MW-09-22S	9535630	3/29/18	VOA
MW-09-20S	9535631	3/29/18	VOA
DUP032918	9535632	3/29/18	VOA
MW-09-21D	9535633	3/29/18	VOA
MW-09-18S	9535634	3/30/18	VOA
MW-09-19D	9535635	3/30/18	VOA
FB033018	9535636	3/30/18	VOA
MW-03-13S	9535637	3/30/18	VOA
MW-05-15D	9535638	3/30/18	VOA
MW-05-14S	9535639	3/30/18	VOA

Legend:

VOA = Analyzed following USEPA SW846 8260C.

3.0 RESULTS

3.1 GENERAL COMMENTS

With regard to the data package deliverables, most of the NYSDEC ASP Category B Data Deliverable format requirements were met, with the exception of the following correctable deficiencies. Please note that these deficiencies, for the most part, do not impact data usability.

- The laboratory did not include the internal chain-of-custody (COC) as required under NYSDEC ASP Category B Data Deliverable format requirements.

3.2 ORGANIC QUALIFIERS

Hold Times: Technical hold times were assessed by comparing the sample dates with that of the preparation dates and/or analysis dates.

- All samples were analyzed within the required hold time for all analyses.

- The laboratory cooler receipt temperature associated with the reviewed project samples fell outside the 4°C ($\pm$2° C) requirement. The samples are qualified as estimated values “J” and “UJ”.

Blank Contamination: Laboratory method blanks are clean liquid and/or solid matrix samples prepared by the analytical laboratory and analyzed in the same manner as the investigative samples. Water laboratory method blanks are used to identify whether investigative samples have been contaminated during sample preparation, sample analysis or from a previous sample (instrument carry-over).

Field-blanks consist of deionized water poured over or through decontaminated sampling equipment and collected into the sample bottles. Field-blanks measure contamination potentially caused by inadequate decontamination of sampling equipment. Trip-blanks are carbon-free deionized water samples that accompany volatile investigative samples during each stage of shipment, storage and analysis. The trip-blanks are used to assess the potential for artificial introduction of volatile compounds into the investigative samples during the transportation and sample handling processes.

- Chloroform was detected in the field blank sample, FB033018. However, this compound was not detected in any of the samples. No qualifier is required.

- No other contaminants were identified in the laboratory method/trip/field blanks associated with the groundwater samples received and reviewed. No qualifier is required.

GC/MS Performance Check (Tuning) Summary: Gas chromatograph/mass spectrometer (GC/MS) instrument tuning and performance checks are performed to ensure the instrument's ability to provide appropriate mass-resolution, identification, and sensitivity.

- The bromofluorobenzene (BFB) tuning compound mass-ion abundance criteria for the volatile organic compound analyses were reported within control limits. No qualifier is required.

System Monitoring Compound (Surrogate) Recoveries: System monitoring compounds (surrogates) are those compounds, which are not expected to be detected in the investigative samples but which are chemically similar to the analytes of interest. Surrogate compound percent recoveries are used to assess extraction efficiencies, possible matrix effects, and overall analytical accuracy.

- The TCL VOA surrogate recoveries fell within control limits for the project samples received and reviewed. No qualifier is required.

Internal Standards Area Performance: Internal standards are analytes of interest, which are added to the investigative samples prior to analysis to ensure that GC/MS sensitivity and responses remain stable. Internal standards are reported with the volatile analysis.

- The volatile internal standard area counts and retention times fell within control limits for the project samples received and reviewed for TCL VOA analyses. No qualifier is required.

Initial and Continuing Calibration Results: Control limits for initial and continuing instrument calibrations are established to ensure that the instrument is capable of producing accurate quantitative data at the beginning and throughout each of the analyses.

- Due to the high percent difference (%D>20) between the initial and continuing calibration response factors of the VOA compounds listed, the detected and non-detected results reported for bromomethane, chloroethane, trichlorofluoromethane, 1,1-dichloroethene, freon 113, carbon disulfide and carbon tetrachloride are qualified estimated "J" and "UJ". The affected samples are:

MW-09-28D	MW-07-27S	MW-09-24S
MW-09-25D	MW-17-28S	MW-17-29D
MW-09-23D	MW-09-22S	MW-09-20S
DUP032918	MW-09-21D	

- Due to the high percent difference (%D>20) between the initial and continuing calibration response factors of the VOA compounds listed, the detected and non-detected results reported for bromomethane, acetone, 1,1-dichloroethene, freon 113, carbon disulfide and carbon tetrachloride are qualified estimated "J" and "UJ". The affected samples are:

MW-09-18S	MW-09-19D	FB033018
MW-03-13S	MW-05-15D	MW-05-14S

- All other TCL VOA target compound initial and continuing calibration response factors, percent relative standard deviations (%RSD), and percent differences (%D) associated with the reviewed project samples fell within acceptable control limits. No qualifier is required.

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Summaries: Matrix spikes are samples spiked with known concentrations of analytes of interest. The MS/MSD percent recoveries and duplicate results are used to assess extraction efficiencies, possible matrix effects, and overall analytical accuracy and precision.

Blank spikes (BS) are blank samples fortified (spiked) with known concentrations of analytes of interest. The blank spike percent recoveries results are used to assess extraction efficiencies, and overall analytical accuracy and precision.

Field duplicate samples are taken and analyzed as an indication of overall precision. These analyses measure both field and laboratory precision. Therefore, results may have more variability than laboratory duplicates, which measure only laboratory performance.

- The MS/MSD sample, MW-09-18S, was outside acceptable QC limits for the VOA compounds 1,1-dichloroethene, freon 113, trans-1,2-dichloroethene and 1,1,1-trichloroethane, bias high. Since all of these compounds were non-detected in sample MW-09-18S, no qualifier is required.

- The other VOA MS/MSD results (recoveries and Relative Percent Difference or RPD) associated with the reviewed project samples fell within control limits, providing a positive indication of the overall accuracy and precision associated with these analyses. No qualifier is required.

- Sample DUP032918 was collected as a field sample of MW-09-25D. The results fell within acceptable control limits providing a positive indication of the overall accuracy and precision associated with the VOA analyses. No qualifier is required.

Target Compound Identification Quantitation: The laboratory calculations are verified and compound identifications are reviewed and assessed by the data reviewer.

- The GC and GC/MS raw data (quantitation reports, chromatograms and GC/MS mass-spectra) were provided for review. No laboratory calculation errors were noted for the reviewed project samples. No further action is required from the laboratory.

Additional Comments

- As per the requirements, values calculated below the Reporting Limit (RL) should be considered estimated and are flagged (J) on the summary table.

4.0 CONCLUSIONS

Overall, the data quality is acceptable. The Data Validation Review has identified aspects of the analytical data that require qualification. Data qualifiers, when applicable, are placed next to the results so that the data user can assess the qualitative and/or quantitative reliability of the reported results. Except where noted, the laboratory analytical data contained herein are deemed usable and in compliance with the NYSDEC ASP B Data Deliverable Format requirements. To confidently use any of the data within the data set, the data user should understand the limitations and qualifications presented.

DATA VALIDATION REVIEW
PROJECT: COLUMBIA CEMENT, FREEPORT, LONG ISLAND, NY
DATE SAMPLES COLLECTED: APRIL 7, 2018
JOB NO.: 60481767

LAB REPORT NO. 9548085-9549093

1.0 INTRODUCTION

This Data Validation Review has been performed in accordance with the requirements specified in the standard operating procedures for the validation of USEPA Low/Medium Volatile Data Validation, SOP No. HW-33, Revision 3, dated March 2013. The quality assurance review requirements are applied such that specifications of the methods take precedence over the specifications of the USEPA Region II data review guidelines in those instances where the specifications differ.

The objective of the review was to assess data usability and compliance with New York State Department of Environmental Conservation (NYSDEC) ASP Category B deliverable requirements. The Data Validation Review provides an interpretation of data usability based on the reported quality control parameters. A total of six water samples, one field duplicate samples, one field blank sample and one trip blank sample were collected by AECOM, Clifton, New Jersey, office personnel and submitted to Eurofins Lancaster Laboratories Environmental (NYSDEC Certification No. 10670). Section 2.0 of this report summarizes the samples included in this review and the analyses performed. The groundwater samples were analyzed following USEPA CLP and Standard Methodologies. The laboratory analytical data set contained herein was prepared in accordance with NYSDEC ASP Category B Data Deliverable Format (Exhibit B).

The organic data quality review is based on the following parameters:

* Hold Times
* Blank Contamination
* GC/MS Performance Check (Tuning) Summaries
* System Monitoring Compound (Surrogate) Recoveries
* Internal Standard Area Performance
  Initial and Continuing Calibration Results
  Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Summaries
* Target Compound Identification and Quantitation

*All criteria were met for this parameter

This report was prepared to provide a critical review of the laboratory analysis and reported chemical results. Overall, the data quality is acceptable. The results of the Data Validation Review are presented in Section 3.0. Data qualifiers, when applicable, are placed next to the results so that the data user can assess the qualitative and/or quantitative reliability of the reported result.

2.0 SAMPLES INCLUDED IN REVIEW

Lab Report No. 9549085-9549093

Sample ID	Lab ID	Date Collected	Test Requested
MW-09-19D	9549085	4/7/18	VOA
MW-09-18S	9549086	4/7/18	VOA
MW-05-14S	9549087	4/7/18	VOA
MW-05-15D	9549088	4/7/18	VOA
MW-17-27S	9549089	4/7/18	VOA
MW-09-26D	9549090	4/7/18	VOA
DUP040718	9549091	4/7/18	VOA
FB040718	9549092	4/7/18	VOA
TB040718	9549092	4/7/18	VOA

Legend:

VOA = Analyzed following USEPA SW846 8260C.

3.0 RESULTS

3.1 GENERAL COMMENTS

With regard to the data package deliverables, most of the NYSDEC ASP Category B Data Deliverable format requirements were met, with the exception of the following correctable deficiencies. Please note that these deficiencies, for the most part, do not impact data usability.

- The laboratory did not include the internal chain-of-custody (COC) as required under NYSDEC ASP Category B Data Deliverable format requirements.

3.2 ORGANIC QUALIFIERS

Hold Times: Technical hold times were assessed by comparing the sample dates with that of the preparation dates and/or analysis dates.

- All samples were analyzed within the required hold time for all analyses.

- The laboratory cooler receipt temperature associated with the reviewed project fell within the 4°C ($\pm$2° C) requirement. No qualifier is required.

Blank Contamination: Laboratory method blanks are clean liquid and/or solid matrix samples prepared by the analytical laboratory and analyzed in the same manner as the investigative samples. Water laboratory method blanks are used to identify whether investigative samples have been contaminated during sample preparation, sample analysis or from a previous sample (instrument carry-over).

Field-blanks consist of deionized water poured over or through decontaminated sampling equipment and collected into the sample bottles. Field-blanks measure contamination potentially caused by inadequate decontamination of sampling equipment. Trip-blanks are carbon-free deionized water samples that accompany volatile investigative samples during each stage of shipment, storage and analysis. The trip-blanks are used to assess the potential for artificial introduction of volatile compounds into the investigative samples during the transportation and sample handling processes.

- No contaminants were identified in the laboratory method/trip/field blanks associated with the groundwater samples received and reviewed. No qualifier is required.

GC/MS Performance Check (Tuning) Summary: Gas chromatograph/mass spectrometer (GC/MS) instrument tuning and performance checks are performed to ensure the instrument's ability to provide appropriate mass-resolution, identification, and sensitivity.

- The bromofluorobenzene (BFB) tuning compound mass-ion abundance criteria for the volatile organic compound analyses were reported within control limits. No qualifier is required.

System Monitoring Compound (Surrogate) Recoveries: System monitoring compounds (surrogates) are those compounds, which are not expected to be detected in the investigative samples but which are chemically similar to the analytes of interest. Surrogate compound percent recoveries are used to assess extraction efficiencies, possible matrix effects, and overall analytical accuracy.

- The TCL VOA surrogate recoveries fell within control limits for the project samples received and reviewed. No qualifier is required.

Internal Standards Area Performance: Internal standards are analytes of interest, which are added to the investigative samples prior to analysis to ensure that GC/MS sensitivity and responses remain stable. Internal standards are reported with the volatile analysis.

- The volatile internal standard area counts and retention times fell within control limits for the project samples received and reviewed for TCL VOA analyses. No qualifier is required.

Initial and Continuing Calibration Results: Control limits for initial and continuing instrument calibrations are established to ensure that the instrument is capable of producing accurate quantitative data at the beginning and throughout each of the analyses.

- Due to the high percent difference (%D>20) between the initial and continuing calibration response factors of the VOA compound carbon tetrachloride, the non-detected results reported for carbon tetrachloride are qualified estimated "UJ". The affected samples are:

MW-05-15D FB040718 TB040718

- All other TCL VOA target compound initial and continuing calibration response factors, percent relative standard deviations (%RSD), and percent differences (%D) associated with the reviewed project samples fell within acceptable control limits. No qualifier is required.

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Summaries: Matrix spikes are samples spiked with known concentrations of analytes of interest. The MS/MSD percent recoveries and duplicate results are used to assess extraction efficiencies, possible matrix effects, and overall analytical accuracy and precision.

Blank spikes (BS) are blank samples fortified (spiked) with known concentrations of analytes of interest. The blank spike percent recoveries results are used to assess extraction efficiencies, and overall analytical accuracy and precision.

Field duplicate samples are taken and analyzed as an indication of overall precision. These analyses measure both field and laboratory precision. Therefore, results may have more variability than laboratory duplicates, which measure only laboratory performance.

- The VOA LCS results (recoveries and Relative Percent Difference or RPD) associated with the reviewed project samples fell within control limits, providing a positive indication of the overall accuracy and precision associated with these analyses. No qualifier is required.

- Sample DUP040718 was collected as a field sample of MW-09-19D. The results fell within acceptable control limits providing a positive indication of the overall accuracy and precision associated with the VOA analyses with the exception of chloroethane. The detected chloroethane results reported for these two samples are qualified estimated "J".

Target Compound Identification Quantitation: The laboratory calculations are verified and compound identifications are reviewed and assessed by the data reviewer.

- The GC and GC/MS raw data (quantitation reports, chromatograms and GC/MS mass-spectra) were provided for review. No laboratory calculation errors were noted for the reviewed project samples. No further action is required from the laboratory.

Additional Comments

- As per the requirements, values calculated below the Reporting Limit (RL) should be considered estimated and are flagged (J) on the summary table.

4.0 CONCLUSIONS

Overall, the data quality is acceptable. The Data Validation Review has identified aspects of the analytical data that require qualification. Data qualifiers, when applicable, are placed next to the results so that the data user can assess the qualitative and/or quantitative reliability of the reported results. Except where noted, the laboratory analytical data contained herein are deemed usable and in compliance with the NYSDEC ASP B Data Deliverable Format requirements. To confidently use any of the data within the data set, the data user should understand the limitations and qualifications presented.