L.A.B. Validation Corp, 14 West Point Drive, East Northport, NY 11731

DATA USABILITY SUMMARY REPORT – DUSR
DATA VALIDATION SUMMARY

ORGANIC/INORGANIC ANALYSES

VOLATILES BY GC/MS
SEMIVOLATILES BY GC/MS
1,4-DIOXANE BY SIM GC/MS METHOD 8270D
PESTICIDES BY GC
PCBs BY GC
HERBICIDES BY GC
ISOTOPE DILUTION ORGANIC ANALYSIS
PERFLUORINATED ALKYL SUBSTANCES - PFAS (21 ANALYTES)
BY LIQUID CHROMATOGRAPHY/TANDEM MASS SPECTROMETRY (LC/MS/MS)
BY MODIFIED EPA METHOD 537.1
TAL (23) METALS (TOTAL AND DISSOLVED) BY ICPMS/CV
TOTAL CYANIDE
HEXAVALENT/TRIVALENT CHROMIUM

For Groundwater Samples Collected
September 08, 2020, September 09, 2020, and September 10, 2020
From 36-08 Review Avenue
Queens, New York
Collected by Tenen Environmental

SAMPLE DELIVERY GROUP NUMBERs:
L2037103, L2037315, L2037453

BY ALPHA ANALYTICAL (ELAP #11148)

SUBMITTED TO:

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September 01, 2021

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36-08 Review Avenue, Queens, New York –
Groundwater Data Usability Summary Report (Data Validation): September 2020 Sampling Events. Analysis for Volatiles, Semivolatiles including 1,4-Dioxane, Pesticides, PCBs, Herbicides, PFAS (21 Analytes), TAL (23) Total and Dissolved Metals, Total Cyanide, Hexavalent and Trivalent Chromium.

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A validation was performed on groundwater samples and the associated quality control samples (Field Duplicate/MS/MSD/Field Blank/Trip Blanks) for organic/inorganic analysis for samples collected under chain of custody documentation by Tenen Environmental and submitted to Alpha Analytical for subsequent analysis. This report contains the laboratory and validation results for the field samples itemized below. Analysis was performed in accordance with requested tests per the chain of custody documents and in accordance with client instructions.

The samples were analyzed by Alpha Analytical, utilizing SW846 Methods and submitted under NYSDEC ASP Category B equivalent deliverable requirements for the associated analytical methodologies employed. The analytical testing for groundwater samples consisted of Volatile Organics, Semivolatile Organics including 1,4-Dioxane, Pesticides, PCBs, Herbicides, PFAS (21 Analytes), TAL (23) Total and Dissolved Metals, Total Cyanide and Hexavalent/Trivalent Chromium.

The data was evaluated in accordance with EPA Region II National Functional Guidelines for Organic and Inorganic Data Review and EPA Region II SOPs for 8260, 8270, 8081, 8082, 8151 and Metals, NYSDEC Appendix I – Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids (January 2021) and in conjunction with the analytical methodologies for which the samples were analyzed, where applicable and relevant.

The data validation report pertains to the following groundwater samples:

Sample ID	Lab ID	Analysis	Date Collected/ Received
MW-5D [Plus, MS/MSD]	L2037103-01	VOA, SVOA plus 1,4-Dioxane, Pesticides, PCBs, Herbicides, PFAS (21 Analytes), TAL (23) Total and Dissolved Metals, Total Cyanide, Hexavalent and Trivalent Chromium	09/08/2020
MW-6	L2037103-02	VOA, SVOA plus 1,4-Dioxane, Pesticides, PCBs, Herbicides, PFAS (21 Analytes), TAL (23) Total and Dissolved Metals, Total Cyanide, Hexavalent and Trivalent Chromium	09/08/2020
MW-6_DUP	L2037103-03	VOA, SVOA plus 1,4-Dioxane, Pesticides, PCBs, Herbicides, PFAS (21 Analytes), TAL (23) Total and Dissolved Metals, Total Cyanide, Hexavalent and Trivalent Chromium	09/08/2020
MW-3	L2037103-04	VOA, SVOA plus 1,4-Dioxane, Pesticides, PCBs, Herbicides, PFAS (21 Analytes), TAL (23) Total and Dissolved Metals, Total Cyanide, Hexavalent and Trivalent Chromium	09/08/2020
MW-12	L2037103-05	VOA, SVOA plus 1,4-Dioxane, Pesticides, PCBs, Herbicides, PFAS (21 Analytes), TAL (23) Total and Dissolved Metals, Total Cyanide, Hexavalent and Trivalent Chromium	09/08/2020
B-6	L2037103-06	VOA, SVOA plus 1,4-Dioxane, Pesticides, PCBs, Herbicides, PFAS (21 Analytes), TAL (23) Total and Dissolved Metals, Total Cyanide, Hexavalent and Trivalent Chromium	09/08/2020
Field Blank	L2037103-07	VOA, SVOA plus 1,4-Dioxane, Pesticides, PCBs, Herbicides, PFAS (21 Analytes), TAL (23) Total and Dissolved Metals, Total Cyanide, Hexavalent and Trivalent Chromium	09/08/2020
Trip Blank	L2037103-08	VOA	09/08/2020
MW-9	L2037103-09	VOA, SVOA plus 1,4-Dioxane, Pesticides, PCBs, Herbicides, PFAS (21 Analytes), TAL (23) Total and Dissolved Metals, Total Cyanide, Hexavalent and Trivalent Chromium	09/08/2020
MW-8S	L2037315-01	VOA, SVOA plus 1,4-Dioxane, Pesticides, PCBs, Herbicides, PFAS (21 Analytes), TAL (23) Total and Dissolved Metals, Total Cyanide, Hexavalent and Trivalent Chromium	09/09/2020

MW-8D	L2037315-02	VOA, SVOA plus 1,4-Dioxane, Pesticides, PCBs, Herbicides, PFAS (21 Analytes), TAL (23) Total and Dissolved Metals, Total Cyanide, Hexavalent and Trivalent Chromium	09/09/2020
MW-13S	L2037315-03	VOA, SVOA plus 1,4-Dioxane, Pesticides, PCBs, Herbicides, PFAS (21 Analytes), TAL (23) Total and Dissolved Metals, Total Cyanide, Hexavalent and Trivalent Chromium	09/09/2020
MW-13D	L2037315-04	VOA, SVOA plus 1,4-Dioxane, Pesticides, PCBs, Herbicides, PFAS (21 Analytes), TAL (23) Total and Dissolved Metals, Total Cyanide, Hexavalent and Trivalent Chromium	09/09/2020
MW-7S	L2037315-05	VOA, SVOA plus 1,4-Dioxane, Pesticides, PCBs, Herbicides, PFAS (21 Analytes), TAL (23) Total and Dissolved Metals, Total Cyanide, Hexavalent and Trivalent Chromium	09/09/2020
MW-7D	L2037315-06	VOA, SVOA plus 1,4-Dioxane, Pesticides, PCBs, Herbicides, PFAS (21 Analytes), TAL (23) Total and Dissolved Metals, Total Cyanide, Hexavalent and Trivalent Chromium	09/09/2020
MW-10	L2037315-07	VOA, SVOA plus 1,4-Dioxane, Pesticides, PCBs, Herbicides, PFAS (21 Analytes), TAL (23) Total and Dissolved Metals, Total Cyanide, Hexavalent and Trivalent Chromium	09/09/2020
B-8	L2037315-08	VOA, SVOA plus 1,4-Dioxane, Pesticides, PCBs, Herbicides, PFAS (21 Analytes), TAL (23) Total and Dissolved Metals, Total Cyanide, Hexavalent and Trivalent Chromium	09/09/2020
Trip Blank	L2037315-09	VOA	09/09/2020
MW-1S	L2037453-01	VOA, SVOA plus 1,4-Dioxane, Pesticides, PCBs, Herbicides, PFAS (21 Analytes), TAL (23) Total and Dissolved Metals, Total Cyanide, Hexavalent and Trivalent Chromium	09/10/2020
MW11	L2037453-02	VOA, SVOA plus 1,4-Dioxane, Pesticides, PCBs, Herbicides, PFAS (21 Analytes), TAL (23) Total and Dissolved Metals, Total Cyanide, Hexavalent and Trivalent Chromium	09/10/2020
MW-1D	L2037453-03	VOA, SVOA plus 1,4-Dioxane, Pesticides, PCBs, Herbicides, PFAS (21 Analytes), TAL (23) Total and Dissolved Metals, Total Cyanide, Hexavalent and Trivalent Chromium	09/10/2020
MW-4	L2037453-04	VOA, SVOA plus 1,4-Dioxane, Pesticides, PCBs, Herbicides, PFAS (21 Analytes), TAL (23) Total and Dissolved Metals, Total Cyanide, Hexavalent and Trivalent Chromium	09/10/2020
Trip Blank	L2037453-05	VOA	09/10/2020

Data Qualifier Definitions:

The following definitions provide brief explanations of the qualifiers assigned to results in the data review process.

U - The analyte was analyzed for but was not detected above the reported sample quantitation limit.

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ - The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

R - The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.

N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

NJ - The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate quantity.

J+ - The result is an estimated quantity, but the result may be biased high.

J- - The result is an estimated quantity, but the result may be biased low.

D - Analyte concentration is from diluted analysis.

Sample Receipt:
The Chain of Custody documents indicates that the samples were received at Alpha Analytical via laboratory courier upon completion of the sampling events. Sample login notes were generated. The cooler temperatures for the sample receipts were recorded upon receipt and determined to be acceptable (<6.0 degrees C). The actual temperatures are recorded on the sample receipt checklists provided in Appendix A of this report.

No unresolved problems and/or discrepancies were noted, consequently, the integrity of the samples has been assumed to be good.

SDG L2037103 was resubmitted as part of the review process to include the Semivolatile MS/MSD summary forms for MW-5D. SDG L2037453 was also resubmitted to include the full scan Semivolatile and SIM 1,4-Dioxane results for MW-1S.

The data summary Form I's included in Appendix C includes all usable (qualified) and unusable (rejected) results for the samples identified above. The Form I's summarize the detailed narrative section of the report.

NOTE:
L.A.B. Validation Corp. believes it is appropriate to note that the data validation criteria utilized for data evaluation is different than the method requirements utilized by the laboratory. Qualified data does not necessarily mean that the laboratory was non-compliant in the analysis that was performed.

1. Volatile Organics by GC/MS SW846 Method 8260C
The following method criteria were reviewed: holding times, SMCs, MS, MSD, LCS, Laboratory Spiked Blanks, Field Duplicate, Method Blanks, Tunes, Calibrations, Internal Standards, Target Component Identification, Quantitation, Reported Quantitation Limits and Overall System Performance. The Volatile results are valid and usable except for non-detects in all samples for 1,4-Dioxane except for MW-7 due to low calibration responses as noted within the following text:

***** 1,4-Dioxane is usable in the Semivolatile results.***

1.1 Holding Time
The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the technical holding time is exceeded, the data may not be considered valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimates, "J". The non-detects (sample quantitation limits) are required to be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

Samples pertaining to these SDGs were performed within the Method required holding times as well as the technical holding times for data validation of 14 days from collection for HCL preserved vials. No data validation qualifiers were required based upon holding time or sample preservation.

1.2 System Monitoring Compound (Surrogate) Recovery
Samples are spiked with surrogate compounds prior to sample analysis to evaluate overall laboratory performance and efficiency of the analytical technique. If the measure of surrogate concentrations is outside contract specification, qualifications are required to be applied to associated samples and analytes.

Surrogate recoveries (%R) for Dibromofluoromethane, 1,2-Dichloroethane-d4, Toluene-d8 and 4-Bromofluorobenzene were found to be within acceptable limits for surrogate compounds for all analyses.

1.3 Matrix Spikes (MS)/ Matrix Spike Duplicates (MSD)
The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD may be used in conjunction with other QC criteria for additional qualification of data.

MS/MSD was performed on MW-5D. Dichlorodifluoromethane (150%) recovered above limits in the MSD. Data was not qualified since this target analyte was not detected in the parent sample. Elevated recovery does not support any potential loss of detection and/or result bias. Additionally, Vinyl Acetate (61%/66%) recovered below limits. Non-detects in the parent sample have been qualified, "UJ." Acceptable RPD was obtained for all spiked analytes. No additional qualifiers were applied.

The National Functional Guidelines and EPA Region 2 SOPs state that "No qualifications to the data are necessary based on MS data alone."

1.4 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)
The LCS data for laboratory control samples (LCS) are generated to provide information on the accuracy of the analytical method and on the laboratory performance.

LCS/LCS Duplicates were analyzed for each sequence. In cases where high recovery for an analyte was obtained and the target compound was not detected in the associated samples, the data was not qualified. High recovery does not support any potential loss of detection and/or result bias for non-detects. Recovery values were acceptable for all spiked analytes except for:

LCS/LCS Duplicate associated with Field Blank (09/08/2020), Trip Blank (09/08/2020), MW-5D, MW-6, MW-6_DUP, MW-3, MW-12, B-6, and MW-9 yielded RPD for 2-Hexanone above 20% at 24%. Data was not qualified based on this outlier. Additionally, trans-1,4-Dichloro-2-butene (67%) recovered below limits. Non-detects have been qualified, "UJ."

LCS/LCS Duplicate associated with MW-13S, MW13D, MW-7S, MW-7D, MW-10, B-8 and Trip Blank (09/08/2020) yielded RPD for 2-Butanone at 22%. Data was not qualified based on this outlier. Additionally, trans-1,4-Dichloro-2-butene (64%/66%) recovered below limits. Non-detects have been qualified, "UJ."

LCS/LCS Duplicate associated with MW-8S and MW-8D yielded RPD for 2-Hexanone at 24%. Data was not qualified based on this outlier. Additionally, trans-1,4-Dichloro-2-butene (67%) recovered below limits. Non-detects have been qualified, "UJ."

LCS/LCS Duplicate associated with Trip Blank (9/10/2020), MW_1I, MW-1D, MW-4 and MW-1S yielded Chloromethane (62%) and Bromomethane (33%) below limits. Non-detects have been qualified, "UJ." RPD for Bromomethane (22%) was also outside acceptance limits. No additional qualifiers were applied.

1.5 Blank Contamination

Quality assurance (QA) blanks, i.e., method, trip and field blanks are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field blanks measure cross-contamination of samples during field operations.

The following table was utilized to qualify target analyte results due to contamination. The largest value from all the associated blanks is required to be utilized:

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Storage, field, Trip, Instrument	Detects	Not Detected	No qualification required
	<CRQL*	<CRQL*	Report CRQL value with a U
		>/= CRQL* and <2x the CRQL**	No qualification required
	>CRQL*	</= CRQL*	Report CRQL value with a U
		>/=CRQL* and </= blank concentration	Report blank value for sample concentration with a U
		>/= CRQL* and > blank concentration	No qualification required
	=CRQL*	</= CRQL*	Report CRQL value with a U
		>CRQL*	No qualification required
	Gross Contamination**	Detects	Report blank value for sample concentration with a U

*2x the CRQL for methylene chloride, 2-butanone, and acetone.
**4x the CRQL for methylene chloride, 2-butanone, and acetone
***Qualifications based on instrument blank results affect only the sample analyzed immediately after the sample that has target compounds that exceed the calibration range or non-target compounds that exceed 100 ug/L.
Below is a summary of the compounds in the sample and the associated qualifications that have been applied:

A) **Method Blank Contamination:**
Method blank associated with Field Blank (09/08/2020), Trip Blank (09/08/2020), MW-5D, MW-6, MW-6_DUP, MW-3, MW-12, B-6, and MW-9 yielded Acetone at 2.6 ug/L. The laboratory reported concentrations in MW-5D, MW-6_DUP and MW-9 have been negated, "U."

Method blank associated with MW-8S and MW-8D yielded Acetone at 2.6 ug/L. The laboratory reported concentrations in these field samples has been negated, "U."

B) **Field Blank Contamination:**
Acetone was detected at 1.6 ug/L in Field Blank (09/08/2020). Associated field sample results were previously negated, "U" due to method blank contamination.

C) **Trip Blank Contamination:**
No target analytes were detected in the Trip Blanks.

Methylene Chloride, Acetone and 2-Butanone are common lab contaminants. The end user should proceed with caution when making decisions based on common contaminants where the analyte could not be negated due to blank contamination, Acetone detections in MW-13D (5.6 ug/L), MW-7D (4.6 ug/L) and MW-4 (3.8 ug/L) should be considered suspect.

1.6 GC/MS Instrument Performance Check

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The Tuning standard for volatile organics is Bromofluorobenzene (BFB).

Instrument performance was generated within acceptable limits and frequency for Bromofluorobenzene (BFB) for all analyses.

1.7 Initial and Continuing Calibrations

Satisfactory instrument calibration is established to ensure that the instrument can produce acceptable quantitative data. An initial calibration demonstrates that the instrument can produce acceptable performance at the beginning of an experimental sequence.

The continuing calibration checks document that the instrument is giving satisfactory daily performance. Initial calibration verifications were acceptable.

A) Response Factor GC/MS:

The response factor measures the instrument's response to specific chemical compounds. The response factor for all compounds must be >/= 0.05 in both initial and continuing calibrations. A value <0.05 indicates a serious detection and quantitation problem (poor sensitivity). Analytes detected in the sample will be qualified as estimated, "J". All non-detects for that compound in the corresponding samples will be rejected, "R". Method 8260C allows for a minimum response factor of 0.1 for Acetone and 2-Butanone. Validation criteria allows response factor to be /=>0.01 for poor responders (Acetone, MEK, Carbon Disulfide, Chloroethane, Chloromethane, Cyclohexane, 1,2-Dibromoethane, Dichlorodifluoromethane, cis-1,2-Dichloroethene, 1,2-Dichloropropane, 1,2-Dibromo-3-chloropropane, Isopropylbenzene, Methyl Acetate, Methylene Chloride, Methylcyclohexane, MTBE, trans-1,2-Dichloroethene, 4-Methyl-2-Pentanone, 2-Hexanone, Trichlorofluoromethane, 1,1,2-Trichloro-1,2,2-Trifluoroethane.

The response factors for the target analytes reported were found to be within acceptable limits (>/=0.05) and (>/= 0.01 for poor responders) and minimum response criteria in Table 4 of Method 8260C, for the initial and continuing calibrations for all reported analytes except for 1,4-Dioxane (0.001-0.002). 1,4-Dioxane non-detects have been rejected in all samples except MW-7D where the detected concentration of 100 ug/L has been qualified, "J+" biased high. Results for this analyte are usable in the selective ion monitoring (SIM) scans for Semivolatile analysis.

B) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentrations. Percent D compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance. Percent RSD must be <20% and %D must be <20%. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and non-detects are flagged "UJ". If %RSD and %D grossly exceed QC criteria, non-detect data may be qualified, "R", unusable. Additionally, in cases where the %RSD is >20% and eliminating either the high or the low point of the curve does not restore the %RSD to less than or equal to 20% then positive results are qualified, "J". In cases where removal of either the low or high point restores the linearity, then only low or high-level results will be qualified, "J" in the portion of the curve where non-linearity exists. Closing CCV must meet 30% criteria. Poor responders must be </= 40%.

*Method 8260C allows for several analytes to be outside requirements due to the large number of compounds.

Initial Calibrations: The initial calibrations provided and the %RSD were within acceptable limits (20%) and (40% for poor responders) for all reported compounds.

Continuing Calibrations: The continuing calibrations provided and the %D was within acceptable limits (20%) and (40% for poor responders) for all reported compounds with exceptions listed below:

CCAL VOA108 09/11/2020 – Bromomethane – 34.2%, Vinyl Acetate – 30.4%, 2-Hexanone – 40.6%, Trans-1,4-Dichloro-2-butene – 32.8% ; "UJ" non-detects in Field Blank, Trip Blank (09/08/2020), MW-5D, MW-6, MW-6_DUP, MW-3, MW-12, B-6, MW-9, MW-8S and MW-8D.

CCAL VOA105 09/10/2020 – Bromomethane – 56.6%, Bromoform – 22.6%, trans-1,4-Dichloro-2-butene – 35.9%, Naphthalene – 20.3%; "UJ" non-detects in MW-13S, MW-13D, MW-7S, MW-7D, MW-10, B-8 and Trip Blank (09/09/2020).

CCAL VOA101 09/14/2020 – Bromomethane – 67.3%, 1,1-Dichloroethene – 21.9%, 1,1-Dichloropropene – 21.4%; "J/UJ" results for Trip Blank (09/10/2020), MW1I, MW-1D, MW-4 and MW-1S.

1.8 Internal Standards

Internal Standards (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must not vary by more than a factor of 2 (-50% to +100%) from the associated continuing calibration standard. The retention time of the internal standard must not vary more than +/-30 seconds from the associated continuing calibration standard. If the area count is outside the (-50% to +100%) range of the associated standard, all the positive results for compounds quantitated using that IS are qualified as estimated, "J", and all non-detects as "UJ", or "R" if there is a severe loss of sensitivity.

If an internal standard retention time varies by more than 30 seconds, professional judgment will be used to determine either partial or total rejection of the data for that sample fraction.

Samples were spiked with the internal standards Fluorobenzene, Chlorobenzene-d5 and 1,4-Dichlorobenzene-d4 prior to sample analysis. The area responses and retention time of each internal standard met QC criteria in all samples.

1.9 Field Duplicates

Field duplicate samples are collected and analyzed as an indication of overall precision. These results are expected to have more variability than laboratory duplicate samples.
An acceptable RPD is 50% as documented in EPA Region 2 SOP HW33. Professional judgment is utilized for analytes that demonstrate high percent difference.

Field duplicate analysis was collected on MW-6 and MW-6_DUP. Precision is acceptable for all detected analytes.

1.10 Target Compound List Identification

TCL compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within =/- 0.06RRT units of the standard compound and have an ion spectrum

which has a ratio of the primary and secondary m/e intensities within 20% of that in the standard compound.

GC/MS spectra met the qualitative criteria for identification. All retention times were within required specifications.

1.11 Tentatively Identified Compounds (TICs)

TICs were not required for these sampling events. When detected the identification must be considered tentative (both quantitative and qualitative) due to the lack of required compound specific response factors. Consequently, all concentrations should be considered estimated, "J" due to the qualitative uncertainty should be qualified, "N" where an identification has been made.

TICS were not required.

1.12 Compound Quantification and Reported Detection Limits

GC/MS quantitative analysis is acceptable. Correct internal standards per SW846 and response factors were used to calculate final concentrations.

As required, the laboratory reported "J" values between the reporting limits (RL) and Method Detection Limits (MDLs). This is consistent with common laboratory practices and a requirement of the National Environmental Laboratory Approval Program (NELAP).

Samples were analyzed undiluted at 10mls except for MW-1S which was analyzed at a 1:500 dilution. Target concentrations support the dilution that was performed. There is potential that lower-level hits were lost in sample dilution. Analysis is acceptable.

1.13 Overall System Performance

Good resolution and chromatographic performance were observed.

2.0 Semivolatile Organics by GC/MS SW846 Method 8270D and 1,4-Dioxane by 8270D Selective Ion Monitoring (SIM)

The following method criteria were reviewed: holding times, Surrogates, MS, MSD, LCS, Field Duplicate, Blanks, Tunes, Calibrations, Internal Standards, Target Component Identification, Quantitation, Reported Quantitation Limits, and overall system performance. The Semivolatile results are valid and usable except for non-detects for 3,3'-Dichlorobenzidine and 2,4-Dimethylphenol due to non-recoverable MS/MSD values as noted within the following text:

2.1 Holding Time

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the technical holding time is exceeded, the data may not be considered valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimates, "J". The non-detects (sample quantitation limits) are required to be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

Samples were extracted and analyzed within the method required holding times and the technical holding times (7 days from collection for Groundwater and the Field Blank) required for data validation. Sample extracts were analyzed within 40 days of preparation as required.

2.2 Surrogate Recovery

All samples are spiked with surrogate compounds prior to sample preparation/extraction to evaluate overall laboratory performance and efficiency of the analytical technique. Additionally, the sample itself may produce effects due to such factors as interferences and high concentrations of analytes.

Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the evaluation of the data is dependent upon reextraction and/or reanalysis to confirm/negate laboratory error or matrix related problems. Discussion of surrogate recoveries that fell outside (above/below) QC guidelines is itemized below:

Samples were spiked with six (6) surrogate standards at the sample extraction portion of analysis for full scan. Method allows for one (1) base neutral and one (1) acid recovery to be outside acceptance limits providing the recovery value is >10% without requiring reextraction/reanalysis. Acceptable surrogate recovery values were obtained for all full scan analysis. Selective Ion Monitoring analysis of MW-5D yielded low 2-Fluorophenol (14%) recovery. No target analytes from the SIM scan are applicable to this surrogate standard. No qualifiers were applied based on this outlier. Additionally, MW-9 yielded2,4,6-Tribromophenol (129%) above in house established limits. Again, no target analytes are impacted. Nitrobenzene-d5 recovered above limits in MW1I (121%). No qualifiers were applied. Surrogate 1,4-Dioxane-d8 was acceptable for SIM analysis. No qualifiers are required based on surrogate recovery data.

2.3 Matrix Spikes (MS)/Matrix Spike Duplicates (MSD)

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices.

MS/MSD was performed on MW-5D. 3,3'-Dichlorobenzidine was not recoverable (0%/0%) in the MS and MSD. 2,4-Dimethylphenol was not recoverable (0%) in the MS. Non-detects in the parent sample must be considered unreliable and have been rejected, "R." 4-Chloroaniline (38%/39%) and 4-Nitroaniline (50%) also recovered below limits. Non-detects in the parent sample have been qualified, "UJ." SIM MS/MSD recovery values were acceptable. RPD met acceptance criteria for all spiked compounds.

The National Functional Guidelines and EPA Region 2 SOPs state that "No qualifications to the data are necessary based on MS data alone."
alone."

2.4 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

The LCS data for laboratory control samples (LCS) are generated to provide information on the accuracy of the analytical method and on the laboratory performance.

Acceptable LCS/LCS Duplicates were analyzed with each sequence. In cases where high recovery for an analyte was obtained and the target compound was not detected in the associated samples, the data was not qualified. High recovery does not support any potential loss of detection and/or result bias for non-detects. Recovery values were acceptable for all spiked analytes with exceptions noted below:

LCS/LCS Duplicate associated with MW-9 yielded 4-Chloroaniline (38%/30%) below limits. Non-detects have been qualified, "UJ."

LCS Duplicate for SIM analysis associated with MW1I, MW1D, MW-4 and MW-1S yielded Indeno (1,2,3-cd) pyrene (142%) and Pentachlorophenol (142%) above limits. The laboratory detected concentration of Pentachlorophenol (0.34 ug/L) in MW-1S must be considered estimated, biased high and has been qualified, "J+." No additional qualifiers are required since these target compounds were not detected in remaining associated samples.

2.5 Method Blanks

Quality assurance (QA) blanks, i.e., method, trip and field blanks are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field blanks measure cross-contamination of samples during field operations.

The following table was utilized to qualify target analyte results due to contamination. The largest value from all the associated blanks is required to be utilized:

For:	Flag Sample Result with a "U" when:	Report CRQL & Qualify "U" when:	No Qualification is Needed when:
Phthalates (common laboratory contaminants)	Sample Conc. is >CRQL, but </=5x blank value	Sample Conc. Is <CRQL and </=5x blank value	Sample Conc. is >CRQL and >5x blank value
Other Contaminants	Sample Conc. is >CRQL, but </=1x blank value	Sample Conc. Is <CRQL and </=1x blank value	Sample Conc. is >CRQL and >1x blank value

Below is a summary of the compounds in the sample and the associated qualification that have been applied:

A) **Method Blank Contamination:**

Dimethyl phthalate was detected in the method blank associated with MW-1I, MW-1D and MW-4 at 2.2 ug/L. This analyte was not detected in associated field samples. Results are not impacted.

B) **Field Blank Contamination:**

The Field Blank yielded 2-Methylnaphthalene in the SIM analysis (0.03 ug/L). The laboratory reported concentrations (0.03 ug/L) in MW-12 and MW-9 have been negated, "U."

Phthalates are common laboratory contaminants. The detected concentrations of Di-n-Butyl phthalate [0.55 ug/L] and Bis (2-ethylhexyl) phthalate [1.8 ug/L) in MW-5D, Di-n-butyl phthalate [0.72 ug/L) in MW-6, Bis (2-ethylhexyl) phthalate [1.7 ug/L) and Di-n-butyl phthalate [1.3 ug/L) in MW-6_DUP, Bis (2-ethylhexyl) phthalate [1.8 ug/L) in MW-3, Bis (2-ethylhexyl) phthalate [1.6 ug/L) and di-n-butyl phthalate [1.2 ug/L) in MW-12, Di-n-butyl phthalate [0.74 ug/L] in B-6, Diethyl phthalate [21 ug/L)and Dimethyl phthalate [180 ug/L) in MW1S, Bis (2-ethylhexyl) phthalate [2.6 ug/L] in MW-1I and Bis (2-ethylhexyl) phthalate [1.6 ug/L] and Di-n-butyl phthalate [1.0 ug/L) in MW-4 could not be negated due to lack of presence in the corresponding blanks.

2.6 GC/MS Instrument Performance Check

Tuning and performance criteria are established to ensure adequate mass resolution proper identification of compounds and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The Tuning standard for semivolatile organics is decafluorotriphenylphosphine (DFTPP).

Instrument performance was generated within acceptable limits and frequency (12 hours) for decafluorotriphenylphosphine (DFTPP) for all analyses. Acceptable DDT breakdown was observed, and tailing factor met acceptance criteria.

2.7 Initial and Continuing Calibrations

Satisfactory instrument calibration is established to ensure that the instrument can produce acceptable quantitative data. An initial calibration demonstrates that the instrument can give acceptable performance at the beginning of an experimental sequence.

The continuing calibration checks document that the instrument is giving satisfactory daily performance.

A) Response Factor GC/MS:
The response factor measures the instrument's response to specific chemical compounds. The response factor for all compounds must be >/= 0.05 in both initial and continuing calibrations. A value <0.05 indicates a serious detection and quantitation problem (poor sensitivity). Analytes detected in the sample will be qualified as estimated, "J". All non-detects for that compound in the corresponding samples will be rejected, "R".

The response factors for the target analytes reported were found to be within acceptable limits (>/=0.05), for the initial (average RRF) and continuing calibrations.

B) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):
Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentrations. Percent D compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance. Percent RSD must be <20% and %D must be <20%. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and non-detects are flagged "UJ". If %RSD and %D grossly exceed QC criteria, non-detect data may be qualified, "R", unusable. Additionally, in cases where the %RSD is >30% and eliminating either the high or the low point of the curve does not restore the %RSD to less than or equal to 20% then positive results are qualified, "J". In cases where removal of either the low or high point restores the linearity, then only low or high-level results will be qualified, "J" in the portion of the curve where non-linearity exists. Due to the large number of analytes in this method, it is expected for some analytes to fall outside acceptance criteria and the calibration is still considered valid. Acceptable Initial Calibration Verifications were performed.

Initial Calibrations: The initial calibrations provided and the %RSD were within acceptable limits (20%) for all reported compounds.

Continuing Calibrations: The continuing calibrations provided and the %D was within acceptable limits (20%) for all reported compounds with exceptions noted below:

CCAL SV106 09/13/2020 – Bis (2-chloroisopropy) ether – 21.2%, 2,4-Dinitrophenol – 21.5%; "UJ" non-detects in MW-9.

CCAL SV119 SIM 09/14/2020 – Indeno (1,2,3-cd) pyrene – 25.1%, Dibenz (a, h) anthracene – 31.4%, Benzo (g,h,i) perylene – 25.0%; "J/UJ" results in MW-6_DUP, MW-3, B-6 and the Field Blank.

CCAL SV106 09/14/2020 – Bis (2-chloroisopropyl) ether – 21.95, 2-Nitrophenol – 26.9%; "UJ" non-detects in MW1I, MW-1D and MW-4.

CCAL SV125 SIM 09/15/2020 – Pentachlorophenol – 20.4%, Indeno (1,2,3-cd) pyrene – 20.4%, Dibenz (a,h) anthracene – 25.3%; "UJ" non-detects in MW1I, MW-1D and MW-4.

2.8 Internal Standards
Internal Standards (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must not vary by more than a factor of 2 (-50% to +100%) from the associated continuing calibration standard. The retention time of the

internal standard must not vary more than +/-30 seconds from the associated continuing calibration standard. If the area count is outside the (-50% to +100%) range of the associated standard, all the positive results for compounds quantitated using that IS are qualified as estimated, "J", and all non-detects as "UJ", or "R" if there is a severe loss of sensitivity.

If an internal standard retention time varies by more than 30 seconds, professional judgment will be used to determine either partial or total rejection of the data for that sample fraction.

All area responses and retention times fell within established QC ranges for sample analysis.

2.9 Field Duplicates

Field duplicate samples are collected and analyzed as an indication of overall precision. These results are expected to have more variability than laboratory duplicate samples.

An acceptable RPD is 25% as documented in EPA Region 2 SOP HW33 for aqueous samples. Professional judgment is utilized for analytes that demonstrate high percent difference.

Field duplicate analysis was conducted on MW-6 as MW-6_DUP. Acceptable precision was obtained for 1,4-Dichlorobenzene (0.46 ug/L vs 0.49 ug/L). Low 1,2-Dichlorobenzene (0.48 ug/L) was detected in the field duplicate and not in the parent sample. The detection is less than the reporting limit and qualified, "J" by the laboratory. No additional qualifiers were applied for this analyte. Di-n-butyl phthalate (0.72 ug/L vs. 1.3 ug/L) yielded RPD >25%. Results for this compound are qualified, "J" by the laboratory. No additional qualifiers were applied. Low bis (2-ethyl hexyl) phthalate – 1.7 ug/L was detected in the field duplicate and not in the parent. Again, this concentration is below the reporting limit and qualified, "J" by the laboratory. No additional qualifiers were applied for this compound. SIM analysis yielded higher results in the parent sample (>25%) for Fluoranthene, Benzo (a) anthracene, Benzo (a) pyrene, Benzo (b) fluoranthene, Chrysene, Benzo (g,h,i) perylene, Dibenz (a,h) anthracene, Indeno (1,2,3-cd) pyrene and Pyrene. Results in the parent and field duplicate must be considered estimated and have been qualified, "J." It is recommended that the end user make decisions based on the higher parent concentrations for these compounds.

2.10 Target Compound List Identification

TCL compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within =/- 0.06RRT units of the standard compound and have an ion spectrum which has a ratio of the primary and secondary m/e intensities within 20% of that in the standard compound.

Mass spectra meet criteria.

2.11 Tentatively Identified Compounds (TICs)

TICs were not required for these sampling events. The identification must be considered tentative (both quantitative and qualitative) due to the lack of required compound specific response factors. Consequently, all concentrations should be considered estimated, "J" and because of the qualitative uncertainty should be qualified, "N" where an identification has been made.

TICs were not required.

2.12 Compound Quantification and Reported Detection Limits

GC/MS quantitative analysis is acceptable. Correct internal standards and response factors were used to calculate final concentrations.

As required, the laboratory reported "J" values between the reporting limits (RL) and Method Detection Limits (MDLs). This is consistent with common laboratory practices and a requirement of the National Environmental Laboratory Approval Program (NELAP). Samples were analyzed undiluted except for full scan analysis of MW1S (1:10), SIM analysis (1:2) and 1,4-Dioxane (1:10). The sample chromatograms support the dilutions that were performed due to complicated matrix. Aqueous samples were extracted by Method 3510C (Separatory Funnel Extraction). Samples were also analyzed by Selective Ion Monitoring (SIM) techniques to achieve lower reporting levels for select analytes.

2.13 Overall System Performance
Good resolution and chromatographic performance were observed.

1,4-Dioxane was reported in the Volatile runs for all samples collected from this site. Non-detects are not usable due to low calibration response. The 1,4-Dioxane results in the 8270D analysis is usable for these samples. 1,4-Dioxane results are reported in ng/L where 1 ng/L = 0.001 ug/L.

3.0 Pesticides by GC SW846 Method 8081B, PCBs by SW846 Method 8082A, Herbicides by 8151A

The following method criteria were reviewed: holding times, Surrogates, MS, MSD, LCS, Field Duplicate, Blanks, Analytical Sequences, Calibrations, Target Component Identification, Quantitation, Reported Quantitation Limits, and overall system performance. The Pesticide, PCB and Herbicide groundwater results are valid and usable as noted within the following text:

3.1 Holding Time
The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the technical holding time is exceeded, the data may not be considered valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimates, "J". The non-detects (sample quantitation limits) are required to be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

Samples were extracted and analyzed within the method required holding times and the technical holding times required for data validation (7 days from collection for the aqueous samples). No qualifiers were required based on holding time.

3.2 Surrogate Recovery
All samples are spiked with surrogate compounds prior to sample preparation/extraction to evaluate overall laboratory performance and efficiency of the analytical technique. Additionally, the sample itself may produce effects due to such factors as interferences and high concentrations of analytes. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the evaluation of the data is dependent upon reextraction and/or reanalysis to confirm/negate laboratory error or matrix related problems. No qualifications were applied if one of the spiked surrogates is above acceptance limits on one of the two columns. Discussion of surrogate recoveries that fell outside (above/below) QC guidelines is itemized below:

Pesticides/PCBs:
Acceptable surrogate recovery values for TCX and DCB were observed on either primary or confirmation column. Confirmation column for MW-5D yielded DCB below limits at 26%. Primary column recovery was acceptable. MS (23%) and MSD (25%) exhibited similar results and therefore low recovery can be attributed to sample matrix effects. Since no target pesticides were detected and primary column met criteria, no qualifiers were applied.

TCX recovered above limits on the primary column in MW-1S at 1650% due to visible early eluting non-target presence and matrix interferences. Confirmatory column recovery was acceptable (99%). No target analytes were detected. Reported results are no impacted.

Herbicides:
Acceptable DCAA recovery values were obtained on both primary and confirmation column for all analyses.

3.3 Matrix Spikes (MS)/Matrix Spike Duplicates (MSD)

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices.

MS/MSD was performed on MW-5D. Acceptable recoveries and RPD were obtained for Pesticides, PCBs, and Herbicides.

The National Functional Guidelines and EPA Region 2 SOPs state that "No qualifications to the data are necessary based on MS data alone."
alone."

3.4 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

The LCS data for laboratory control samples (LCS) are generated to provide information on the accuracy of the analytical method and on the laboratory performance.

LCS/Blank Spikes were analyzed for each analytical extraction batch for Pesticides, PCBs, and Herbicides. Recovery values were acceptable for all LCS/LCS Duplicate pairs. RPD for all Pesticide compounds in the LCS/LCS Duplicate associated with MW-1I, MW-1D, MW-4 and MW-1S was outside 20%. Since recovery values were acceptable for both the LCS and the LCS Duplicate, the data was not qualified based on professional judgment.

3.5 Blanks

Quality assurance (QA) blanks, i.e., method, instrument, trip, and field blanks are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Instrument blanks measure carryover for cross contamination. Field blanks measure cross-contamination of samples during field operations.

The following table was utilized to qualify target analyte results due to contamination. The largest value from all the associated blanks is required to be utilized:

For:	Flag Sample Result with a "U" when:	Report CRQL & Qualify "U" when:	No Qualification is Needed when:
Any Contaminant	Sample Conc. is >CRQL, but </=5x blank value	Sample Conc. Is <CRQL and </=5x blank value	Sample Conc. is >CRQL and >5x blank value

Extraction and Instrument blanks were performed at the appropriate frequency.
Below is a summary of blank contamination:

A) **Method Blank Contamination:**
No target analytes were detected in the method blanks.

B) **Field Blank Contamination:**
No target analytes were detected in the Field Blank.

3.6 Calibration Verification

Initial and continuing calibration sequence was performed as required for individual and multi-component Pesticide, PCB and Herbicide standards. Acceptable DDT and Endrin breakdown percent difference (<20%) was observed. Acceptable retention times were obtained for all analysis and GC resolution is acceptable for both columns.

Linearity criteria for the initial standards have been satisfied for both columns as detailed below:

%RSD </= 20% for single component compounds except alpha-BHC and delta-BHC
%RSD </=30% for Toxaphene peaks
%RSD </= 30% for Surrogates (TCMX and DCB)
%RSD <20% for PCB Aroclors
%RSD <20% for Herbicides
Continuing calibration verifications:
For Pesticide analysis, acceptable percent difference for any Pesticide/Herbicide is 20% and for PCB analysis, the acceptable limit is 15%.

Calibrations met method requirements for Pesticide/PCBs/Herbicides on either Channel A or B.

3.7 Field Duplicates

Field duplicate samples are collected and analyzed as an indication of overall precision. These results are expected to have more variability than laboratory duplicate samples.

An acceptable RPD is 25% as documented in EPA Region 2 SOP HW33 for aqueous matrices. Professional judgment is utilized for analytes that demonstrates high percent difference.

Field duplicate analysis was conducted on MW-6 and MW-6_DUP. No target Pesticides, PCBs or Herbicides were detected in either the parent or field duplicate. Precision is acceptable.

3.8 Target Compound Identification

Qualitative criteria for compound identification have been established to minimize the number of false positives and false negatives. The retention times of all target analytes have been verified in the samples to that of the
analyzed reference standards

Acceptable DDT/Endrin breakdown was observed.

Positive Pesticide/PCB/Herbicide sample results are compared and where %Difference >25% when quantitated on the two columns the qualifications below are applied. Sample chromatograms were reviewed for the presence of interference. The following qualifications were applied where neither column shows interference:

%Difference	Qualifier
0-25%	None
26-70%	"J"
71-100%	"JN"
101-200% (no interference)	"R"
101-200% (interference detected) *	"JN"
>50% (Pesticide value is <CRQL)**	"U"
>201%	"R"

***When the reported %D is 101-200%, but interference is determined on either column, the results shall be qualified, "JN"**

**** When the reported pesticide value is lower than the CRQL; and the %D is >50%, raise the value to the CRQL and qualify "U", undetected.**

Sample results were evaluated based on the above criteria.

Chlordane – 26%; The laboratory reported concentration of 0.24 ug/kg in MW-13S has been qualified, "J."

Heptachlor Epoxide – The laboratory reported concentration (0.003 ug/L) has been qualified, "J."

2,4-D – The laboratory reported concentration (15.8 ug/L) has been qualified, "J."

No additional qualifiers are required for Pesticides, PCBs, or Herbicides in any of the samples pertaining to these SDGs.

3.9 Compound Quantification and Reported Detection Limits
TCL compounds are identified on the GC by using the analyte's relative retention time (RRT) and by comparison to the primary column and the secondary confirmation column data.

Samples were analyzed undiluted except for Pesticide (1:10) and PCB (1:5) analysis of MW-1S due to complicate matrix. Reporting limits have been adjusted for the extract dilution. Sample results were quantitated via the Internal Standard Method.

3.10 Overall System Performance
Acceptable system performance was maintained throughout the analysis of all samples. Good resolution and chromatographic performance were observed.

Groundwaters samples were concentrated to 1ml for Pesticides and PCBs. Herbicides were concentrated to 10mls. This is acceptable practice and method compliant. The laboratory reporting levels reflect the appropriate extraction concentration volumes.

4.0 Perfluorinated Alkyl Substances (PFAS) by LC/MS/MS EPA Modified Method 537.1
The following method criteria were reviewed: Holding times, Surrogates, MS, MSD, LCS/Laboratory Spiked Blanks, Method Blanks, Calibrations, Target Component Identification, Quantitation, Reported Quantitation Limits and Overall System Performance. The PFAS results are valid and useable as noted within the following text:

4.1 Holding Time/Preservation
The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the technical holding time is exceeded, the data may not be considered valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimates, "J". The non-detects (sample quantitation limits) are required to be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

Samples pertaining to these SDGs were extracted and performed within the method required holding times of 14 days from collection to extraction and 40 days from extraction to analysis. No data validation qualifiers were required based upon holding time. Samples were received properly preserved within temperature requirements of 6 degrees Celsius.

4.2 System Monitoring Compound (Surrogate) Recovery

All samples are spiked with surrogate compounds prior to sample analysis to evaluate overall laboratory performance and efficiency of the analytical technique. If the measure of surrogate concentrations is outside contract
specification, qualifications are required to be applied to associated samples and analytes.

Surrogate recoveries (%R) for Isotope Dilution analysis were found to be within acceptable limits with exceptions discussed below. Data was qualified based on the following criteria:

Recovery <50% or >150%	**Apply "J" Qualifier**
Recovery <25% or >150% for poor responding analytes	**Apply "J" Qualifier**
Isotope Dilution Analyte (IDA) recovery <10%	**Reject Results, "R"**

Note: Problematic analytes (PFBA, PFPeA, Fluorotelomer sulfonates) can have wider recoveries without qualification.

M2-6:2FTS – MW-5D (287%), MW-6 (257%), MW-6_DUP (266%), MW-3 (164%), MW-12 (154%), MW-9 (234%), MW-8D (176%), MW-13D (164%), MW-7S (249%), MW-7D (203%), B-8 (166%) and MW-1S (352%). Results for 6:2 FTS have been qualified, "J/UJ"

M2-8:2FTS – MW-5D (201%), MW-6 (348%), NW-6_DUP (376%), MW-9 (297%); "J/UJ" results for 8:2 FTS.

D3-NMeFOSAA – Recovery values outside criteria were obtained for MW-6 (151%), MW-8S (46%), MW-13S (41%), MW-1S (577%), MW-1I (47%), MW-1D (45%), MW-4 (43%). Results for NMeFOSAA have been qualified, "J/UJ."

M7-PFUDA – Recovery was above limits in MW-1S (547%). Results for PFUnA have been qualified, "UJ."

M8FOSA – Recovery values <25% have been qualified, "J/UJ" for FOSA in MW-3 (14%), MW-12 (23%), B-6 (15%). This surrogate recovered above limits in MW-1S at 183%. Non-detects in this location have been qualified, "UJ."

D5-NETFOSAA – Recovery values >150% was obtained in MW-1S (291%). Non-detects for NEtFOSAA have been qualified, "UJ."

MPFDOA recovered above limits in MW-1S (291%). Non-detects for PFDoA have been qualified, "UJ."

M2PFTEDA recovered above limits in MW-1S (335%). Non-detects for PFTA have been qualified, "UJ."

4.3 Matrix Spikes (MS)/Laboratory Duplicates (DUPs)

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD may be used in conjunction with other QC criteria for additional qualification of data.

Recovery <70% or >130%	Apply "J" qualifier to detects and 'UJ" qualifier to non-detects of parent sample only
RPD >30%	Apply "J" qualifier to detects and 'UJ" qualifier to non-detects of parent sample only

MS analysis was conducted on MW-8S. MS/MSD was also analyzed on MW-5D. Acceptable spike recoveries and RPD were obtained for all spiked analytes. No qualifications were required based on matrix spike data.

4.4 Laboratory Control Sample (LCS)

The LCS data for laboratory control samples (LCS) are generated to provide information on the accuracy of the analytical method and on the laboratory performance.

LCS/Blank Spike was analyzed. Recovery values were acceptable (70-130%) for all twenty-one (21) spiked compounds as required. In cases where outliers are obtained the following qualifiers are required:

Recovery <70% or >130%	**Apply "J" qualifier to detects and "UJ" qualifier to non-detects**

4.5 Blank Contamination

Quality assurance (QA) blanks, i.e., method, trip and field blanks are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field blanks measure cross-contamination of samples during field operations.

The following table was utilized to qualify target analyte results due to contamination. The largest value from all the associated blanks is required to be utilized:

Blank Result	Sample Result	Qualification
Any detection	<Reporting Limit	Qualify as ND as reporting limit
Any detection	>Reporting Limit and >10x the blank result	No Qualification
>Reporting Limit	>Reporting limit and <10x the blank result	J+ Biased High

Below is a summary of the compounds in the blanks and the associated qualifications that have been applied:

A) Method Blank Contamination:

The method blank associated with MW-1S, MW1I, MW-1D and MW-4 yielded PFHxA at 0.348 ng/L. Sample results are greater than 10x the blank level. No qualifiers are required.

B) Field Blank Contamination:

No target analytes were detected in the Field Blank.

4.6 Initial and Continuing Calibrations

Satisfactory instrument calibration is established to ensure that the instrument can produce acceptable quantitative data. An initial calibration demonstrates that the instrument can produce acceptable performance at the beginning of an experimental sequence. The continuing calibration checks

document that the instrument is giving satisfactory daily performance. Initial and continuing calibration and verifications were acceptable and met the requirements summarized below:

Initial Calibrations:

%RSD >20% (5-6 calibration levels)	J flag detects and UJ non-detects
R2 >0.990 (5-6 calibration levels)	J flag detects and UJ non-detects
Low-level calibration check <50% or >150%	J flag detects and UJ non-detects
Mid-level calibration check <70% or >130%	U flag detects and UJ non-detects

Initial Calibration Verification:

ICV recovery <70% or >130%	J flag detects and non-detects.

Continuing Calibration Verification:

CCV recovery <70% or >130%	J flag results

Acceptable calibrations were analyzed.

4.7 Internal Standards

Internal Standards (IS) performance criteria ensure that the LC/MS/MS sensitivity and response are stable during every experimental run. The internal standard area count must not vary by more than -50% to +150%) from the associated continuing calibration standard. The retention time of the internal standard must not vary more than +/-0.2 minutes from the associated continuing calibration standard. If the area count is outside the (-50% to +150%) range of the associated standard, all the positive results for compounds quantitated using that IS are qualified as estimated, "J", and all non-detects as "UJ", or "R" if there is a severe loss of sensitivity.

Samples were spiked with internal standards M3PFBA, M2PFOA, M4PFOS and M2PFDA. The area responses (-50-+100%) and retention times (+/-0.2 minutes) of these internal standards met QC criteria as compared to associated continuing calibrations in all samples associated with these SDGs except for low area response in MW-1S for M2PFDA. Non-detects for PFDA have been qualified, "UJ."

4.8 Field/Laboratory Duplicates

Field duplicate samples are collected and analyzed as an indication of overall precision. These results are expected to have more variability than laboratory duplicate samples. Acceptable RPD is 30% where sample concentrations are greater than 2x the reporting limit.

Field duplicate analysis was conducted on MW-6 as MW-6_DUP. Precision is acceptable for all positive detections.

Laboratory duplicate analysis on MW-10 yielded acceptable precision.

4.9 Target Compound List Identification

TCL compounds are identified on the LC/MS/MS by using the analyte's relative retention time (RRT) obtained from known standards.

LC/MS/MS raw data met the qualitative criteria for identification. All retention times were within required specifications.

4.10 Compound Quantification and Reported Detection Limits

LC/MS/MS quantitative analysis is acceptable. Samples were extracted by solid phase extraction techniques via Method 3535. Correct internal standards per EPA Method 537.1 and response factors were used to calculate final concentrations. Aqueous results are reported in ng/L (where 1 ng/L = 0.001 ug/L) for all detections. Acceptable isotope internal standard response was observed except for noted above.

As required, the laboratory reported "J" values between the reporting limits (RL) and Method Detection Limits (MDLs). This is consistent with common laboratory practices and a requirement of the National Environmental Laboratory Approval Program (NELAP).

Samples were analyzed undiluted. Extracts were performed utilizing initial sample volumes of approximately 270mls as verified by laboratory prep sheets except for MW-12 which was extracted from an initial volume of 50mls. Reporting limits have been adjusted accordingly. There is potential that lower-level detections were lost in extract dilution. Extracts were concentrated to 1 ml and the laboratory has injected 3ul for samples and standards which is acceptable practice. Groundwater results are reported in ng/L where (1 ng/L = 0.001 ug/L). Reporting forms erroneously list "grams" instead of "mls." Manual edits were made to the reporting sheets as part of the review process.

4.11 Overall System Performance

Good resolution and chromatographic performance were observed. Target analyte peaks were properly integrated and consistently when compared to reference standards. In cases where the ratio of quantified ion response to qualifier ion response falls outside the laboratory criteria, results have been qualified, "J" and should be considered estimated.

5.0 Target Analyte List (23) Total and Dissolved Metals by ICPMS/Cold Vapor SW846 Methods 6020B/7470A

The following method criteria were reviewed: holding times, CRDL standards, calibration, blanks, MS, laboratory duplicates, field duplicate, LCS, interference check sample, serial dilutions, and sample results verification. The groundwater results are valid and usable with the appropriate qualifiers as notated in the following text:

5.1 Holding Times

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the technical holding time is exceeded, the data may not be considered valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimates, "J". The non-detects (sample quantitation limits) are required to be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

Samples were digested and analyzed for TAL (23) Metals (total and dissolved) within the method required holding times and the technical holding times for data validation. Samples for dissolved metals were filtered at the laboratory. No qualifications were applied based upon holding time criteria.

5.2 Calibration (ICV/CCV)

Satisfactory instrument calibration is established to ensure that the instruments can produce acceptable quantitative data. An initial calibration demonstrates that the instruments can give acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instruments are giving satisfactory sequential performance and that the initial calibration is still valid.

The ICPMS and Mercury instruments were calibrated utilizing a minimum of a four-point curve in addition to blanks at the beginning of each analytical run. The calibrations have been determined to be acceptable, yielding correlation coefficients of 0.995 or greater.

For ICPMS analysis, satisfactory instrument performance near the Contract Required Detection Limit (CRDL) was demonstrated by analyzing a CRDL standard at the beginning and end of the analytical run. The instruments were calibrated properly by analyzing the CRDL solution at the correct levels and analyzed at the required frequency at the beginning and end of each analytical run. All recoveries were within acceptable limits of 90-110 % for initial calibration pertaining to field samples. Continuing calibrations were within acceptable limits of 90-110% recovery of the true values for ICPMS and Mercury (80-120%) for all field samples. No qualifications were applied based upon ICV/CCV analysis.

5.3 Blanks

Quality assurance (QA) blanks, i.e., method, field or preparation blanks are prepared to identify any contamination that may have been introduced into the samples during sample preparation or field activity. Preparation blanks measure laboratory contamination. Field blanks measure cross-contamination of samples during field operations.

All digestion/prep/ICB/CCB/Field blanks were generated within acceptable limits yielding final concentrations less than the CRDL except for Total Sodium in the Field Blank (0.252 mg/L) and Dissolved Sodium in the Field Blank (0.280 mg/L) . The dissolved metals blank associated with SDG L2037315 yielded Dissolved Sodium above the reporting limit. Sample results are not impacted. Groundwater results were evaluated to the blank levels. The laboratory reported concentration of dissolved Thallium in MW-1S was negated, "U."

Total Metals analysis on the Field Blank yielded Aluminum, Barium, Calcium, Copper, Sodium and Zinc detections. Sample results were greater than the blank levels. Results are not impacted.

Dissolved Metals analysis on the Field Blank yielded Calcium and Sodium. Results are not impacted.

Low levels of Iron, Sodium and Thallium were detected in several of the ICBs/CCBs associated with SDG L2037103 and L2037315. The laboratory reported concentration of Total Thallium has been negated, "U" in MW-5D and MW-7S. Dissolved Thallium has also been negated, "U" in MW-8S, MW-8D, MW-7S and MW-7D. No additional qualifiers are required for this SDG.

No additional qualifications to the data were made based upon blank data.

5.4 Spiked Sample Recovery

The spike data are generated to determine the long terms precision and accuracy of the analytical method in various matrices.

Groundwater spike recoveries are qualified based on the criteria below:
<30% - "R" all detects and non-detects
Between 30%-74% - results >/=MDL "J-" and non-detects "UJ"
Between 126-150% - results >/=MDL "J+" and
>150% - results >/= MDL "R"

Total MS/MSD analysis on MW-5D yielded Iron recovery above limits at 134% in the MS. The laboratory reported concentration of Iron (1.53 mg/L) has been qualified, "J+." RPD met acceptance criteria for all elements. Post digestion recovery (103%) was acceptable.

Dissolved MS/MSD analysis on MW-5D yielded Calcium (138%/140%) and Iron (141%) above limits. Results for these elements must be considered estimated, biased high, "J+" in the parent sample. Post digestion recoveries were acceptable.

MS analysis on MW-8S yielded Dissolved Sodium recovery below limits at 20% due to high parent concentration relative to spike amount. Post digestion recovery was acceptable. Data was not qualified.

Dissolved MS analysis on MW-1S yielded acceptable recovery values for all elements.

Batch MS was also provided in the lab reports for Metals. Data was not qualified based on samples collected from a different site.

5.5 Laboratory/Field Duplicates

The laboratory uses duplicate sample determinations to demonstrate acceptable method precision at the time of analysis. Duplicate analyses are also performed to generate data to determine the long-term precision of the analytical method on various matrices.

Laboratory Duplicates:
RPD >20% but <100% - J detected concentrations
RPD >/=100% - R all detected and non-detected concentrations

Laboratory duplicate analysis on Dissolved MW-8S and MW-1S yielded acceptable precision for all detected elements.

Field Duplicates:
Aqueous:
RPD >/=20% - qualify sample and duplicate results >/= 5x CRQL "J" and samples and/or its field duplicate is <5x the CRQL, qualified, results >MDL as estimated, "J" and non-detects as estimated, "UJ."

Field Duplicate was collected on MW-6 as MW-6_DUP. Total Vanadium (0.00167 mg/L) was detected in the field duplicate and not in the parent sample. The detection is less than the reporting limit and qualified, "J" by the laboratory. No additional qualifiers were applied based on this low detection. Precision is acceptable for remaining elements. Dissolved analysis on this field duplicate pair yielded acceptable precision for all elements.

5.6 Laboratory Control Sample

The laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Aqueous and solid Laboratory Control samples shall be analyzed for each analyte utilizing the same sample preparation, analytical methods and QA/QC procedures as employed for the samples.

Acceptable LCS was analyzed and reported for ICPMS and Mercury analysis. LCS recoveries were within the acceptable limits for Metals analyses (80-120%).

5.7 Interference Check Sample

The interference check sample (ICS) verifies the laboratory's interelement and background correction factors. The ICS consists of two solutions A and AB. Solution A consists of interference, and solution AB consists of the analytes mixed with interferents.

SW846 Methods 6020 requires solution A and solution AB to be analyzed separately. The recoveries for the ICP interference check sample were all within the acceptable limits of 80-120%. No data qualifications were made based upon ICS analysis.

5.8 ICP Serial Dilution

The serial dilution of samples quantitated by ICP determines whether significant physical or chemical interferences exist due to sample matrix. An ICP serial dilution analysis must be performed on a sample for each group of samples with a similar matrix type and concentration, or for each Sample Delivery Group (SDG), whichever is more frequent.

Acceptable ICP serial dilutions were performed at a 5-fold dilution as required by the method where the initial concentration is equal or greater than 50x MDL. Serial dilution analysis agrees within a 10% difference of the original determination after correction for dilution for all reported elements in MW-5D for both total and dissolved analysis. Serial dilution on dissolved MW-8S and MW-1S yielded acceptable percent difference.

5.9 Sample Results Verification

Analyte quantitation was generated in accordance with protocols. The raw data was verified and found within the linear range of each instrument used for quantitation. Raw data supplied corresponds with reported values. Verification of the calculations yielded reported results. Samples were analyzed undiluted as reported on the Form I's. Diluted reanalysis was required for Sodium in MW-12 and MW-9 to obtain the raw concentration within the linear calibration range for both total and dissolved analysis. MW-7D was also reanalyzed at a dilution for Total Sodium. Dissolved MW-7D was analyzed at a 1:10 dilution.

5.10 Overall Assessment of Data

The data generated were of acceptable quality. For the Metals analysis results are usable at the concentrations presented in the validated Form I's.

6. 0 General Chemistry Analysis – Cyanide, Hexavalent and Trivalent Chromium

Total Cyanide analysis was performed by Methods 9010C/9012B. Hexavalent Chromium by Method 7196A and Trivalent Chromium by calculation. The groundwater results are valid and usable with qualifications as notated in the following text.

6.1 Holding Times

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the technical holding time is exceeded, the data may not be considered valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimates, "J". The non-detects (sample quantitation limits) are required to be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

Analysis was performed within the method holding time of 14 days from collection to distillation and 14 days from distillation to analysis for Cyanide and 24 hours from collection for Hexavalent Chromium as required.

6.2 Calibration

Acceptable ICVs and CCVs were analyzed. No qualifications were applied based upon calibration data.

6.3 Blanks

Quality assurance (QA) blanks, i.e., method, field or preparation blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field

activity. Preparation blanks measure laboratory contamination. Field blanks measure cross-contamination of samples during field operations.

Acceptable method blanks were analyzed. Total Cyanide was detected in the Field Blank (09/09/2020) at 0.002 mg/L. The laboratory reported concentration MW-9 (also collected 09/08/2020) has been qualified, biased high, "J+." due to field blank contamination. Remaining Cyanide detections for samples collected 09/09/2020 and 09/10/2020 were not qualified.

6.4 Spiked Sample Recovery

The spike data are generated to determine the long-term precision and accuracy of the analytical method in various matrices.

MS/MSD analysis for Cyanide and Hexavalent Chromium on MW-5D yielded acceptable recovery and RPD. Cyanide and Hexavalent Chromium MS/MSD on B-8 also yielded acceptable precision and RPD.

Cyanide MS analysis on MW-1S yielded low MS recovery (77%). The laboratory reported concentration (0.009 mg/L) has been qualified, biased low, "J-."

Hexavalent Chromium MS on MW-4 yielded acceptable recovery.

Batch MS/MSD was also provided in the lab reports.

6.5 Laboratory/Field Duplicates

The laboratory uses duplicate sample determinations to demonstrate acceptable method precision at the time of analysis. Duplicate analyses are also performed to generate data to determine the long-term precision of the analytical method on various matrices.

Lab duplicate analysis was analyzed on MW-5D, B-8 and MW-1S for Hexavalent Chromium. Precision is acceptable.

Field duplicate analysis of MW-6 as MW-6_DUP resulted in acceptable precision. Neither Cyanide nor Hexavalent Chromium was detected in the field duplicate or parent sample.

6.6 Laboratory Control Sample

The laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Aqueous and solid Laboratory Control samples shall be analyzed for each analyte utilizing the same sample preparation, analytical methods and QA/QC procedures as employed for the samples.

Acceptable LCS and LCS Duplicate was analyzed.

6.7 Sample Results Verification

Analyte quantitation was generated in accordance with protocols. The instrument logs were verified and found within the linear ranges of the instrument used for quantitation.

6.8 Overall Assessment of Data

The data was of acceptable quality.

Reviewer's Signature Paul A. Bly **Date** 09/01/2021

Appendix A
Chain of Custody Documents
And Sample Receipt Checklists

NEW YORK CHAIN OF CUSTODY

ALPHA ANALYTICAL

Westborough, MA 01581 — 8 Walkup Dr. — TEL: 508-898-9220 — FAX: 508-898-9193

Mansfield, MA 02048 — 320 Forbes Blvd — TEL: 508-822-9300 — FAX: 508-822-3288

Service Centers
Mahwah, NJ 07430: 35 Whitney Rd, Suite 5
Albany, NY 12205: 14 Walker Way
Tonawanda, NY 14150: 275 Cooper Ave, Suite 105

Page 1 of

Date Rec'd in Lab: 9/9/20

ALPHA Job #: L2037103

Client Information
Client: Tenen Environmental
Address: 121 West 27th Street Suite 702 NY, NY 10001
Phone: 646-606-2332
Fax: aplatt@tenen-env.com
Email: acarroll@tenen-env.com

Project Information
Project Name: 36-08 Review Ave
Project Location: "
Project #
(Use Project name as Project #) ☒
Project Manager: A. Carroll
ALPHAQuote #:

Turn-Around Time
Standard ☒ Due Date:
Rush (only if pre approved) ☐ # of Days:

Deliverables
☐ ASP-A ☒ ASP-B
☐ EQuIS (1 File) ☐ EQuIS (4 File)
☐ Other

Billing Information
☒ Same as Client Info
PO #

Regulatory Requirement
☒ NY TOGS ☐ NY Part 375
☒ AWQ Standards ☐ NY CP-51
☐ NY Restricted Use ☐ Other
☐ NY Unrestricted Use
☐ NYC Sewer Discharge

Disposal Site Information
Please identify below location of applicable disposal facilities.
Disposal Facility:
☐ NJ ☐ NY
☐ Other:

These samples have been previously analyzed by Alpha ☐

Other project specific requirements/comments:
Cat B Deliverables MS/MSD from MW-5D

Please specify Metals or TAL.

Sample Filtration
☐ Done
☐ Lab to do
Preservation
☐ Lab to do
(Please Specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	VOCs	SVOCs	Total & Dissolved Metals	Pesticides/Herbicides PCBs	Analyte/Hexavalent Chromium	Total Cyanide	PFAS	1,4-Dioxane	Sample Specific Comments	Total Bottle
-01	MW-5D	9/8/2020		Water	AP	X	X	X	X	X	X	X	X		19
-02	MW-6					X	X	X	X	X	X	X	X		
-03	MW-6_DUP					X	X	X	X	X	X	X	X		
-04	MW-3				HP	X	X	X	X	X	X	X	X		
-05	MW-12				AP	X	X	X	X	X	X	X	X		
-06	~~MW~~ B-9				HP	X	X	X	X	X	X	X	X		
-07	Field Blank		9:50		AP	X	X	X	X	X	X	X	X		
-08	Trip Blank					X									2
-09	MW-9	9/8/2020	15:20		AP	X	X	X	X	X	X	X	X		19

Preservative Code: A = None; B = HCl; C = HNO_3; D = H_2SO_4; E = NaOH; F = MeOH; G = $NaHSO_4$; H = $Na_2S_2O_3$; K/E = Zn Ac/NaOH; O = Other

Container Code: P = Plastic; A = Amber Glass; V = Vial; G = Glass; B = Bacteria Cup; C = Cube; O = Other; E = Encore; D = BOD Bottle

Westboro: Certification No: MA935
Mansfield: Certification No: MA015

	V	A	P	A	P	P	P	A
Container Type								
Preservative	B	A	A	A	A	E	A	A

Relinquished By:	Date/Time	Received By:	Date/Time
A. Platt / Tenen	9/8/2020 1550	[illegible] (AAL)	9/8/2020 1550
[illegible] (AAL)	9/8/2020 1810	[illegible] AAL	9/8/20 21:15
[illegible] AAL	9/9/20 00:50	[illegible]	9/9/20 00:50

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)

Form No: 01-25 HC (rev. 30-Sept-2013)

NEW YORK CHAIN OF CUSTODY

ALPHA

Westborough, MA 01581
8 Walkup Dr.
TEL: 508-898-9220
FAX: 508-898-9193

Mansfield, MA 02048
320 Forbes Blvd
TEL: 508-822-9300
FAX: 508-822-3288

Service Centers
Mahwah, NJ 07430: 35 Whitney Rd, Suite 5
Albany, NY 12205: 14 Walker Way
Tonawanda, NY 14150: 275 Cooper Ave, Suite 105

Page 1 of 1

Date Rec'd in Lab: 09/10/2020

ALPHA Job #: L2037315

Client Information
Client: Tetra Environmental
Address: 121 West 27th Street Suite 702, NY, NY 10001
Phone: 646-606-2332
Fax: aplatt@tetra-env.com
Email: acarroll@tetra-env.com

Project Information
Project Name: 36-08 Review Ave
Project Location: //
Project #
(Use Project name as Project #) ☒
Project Manager: A. Carroll
ALPHAQuote #:

Turn-Around Time
Standard ☒ Due Date:
Rush (only if pre approved) ☐ # of Days:

Deliverables
☐ ASP-A ☒ ASP-B
☐ EQuIS (1 File) ☐ EQuIS (4 File)
☐ Other

Billing Information
☒ Same as Client Info
PO #

Regulatory Requirement
☒ NY TOGS ☐ NY Part 375
☒ AWQ Standards ☐ NY CP-51
☐ NY Restricted Use ☐ Other
☐ NY Unrestricted Use
☐ NYC Sewer Discharge

Disposal Site Information
Please identify below location of applicable disposal facilities.
Disposal Facility:
☐ NJ ☐ NY
☐ Other:

These samples have been previously analyzed by Alpha ☐

Other project specific requirements/comments:
Cat B deliverables

Please specify Metals or TAL.

Sample Filtration
☐ Done
☐ Lab to do
Preservation
☐ Lab to do
(Please Specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	VOCs	SVOCs	Total/Dissolved Metals	Pesticides/Herbicides PCBs	Total Cyanide	TAL w/ Hexavalent Chromium	PFAS	1,4-Dioxane	Sample Specific Comments	Total Bottle
37315-01	MW-8S	9/9/20	9:00	Water	HP	X	X	X	X	X	X	X	X		19
-02	MW-8D		10:20		HP	X	X	X	X	X	X	X	X		
-03	MW-13S		9:00		AP	X	X	X	X	X	X	X	X		
-04	MW-13D		10:40			X	X	X	X	X	X	X	X		
-05	MW-7S		11:45			X	X	X	X	X	X	X	X		
-06	MW-7D		12:30			X	X	X	X	X	X	X	X		
-07	MW-10		13:10		HP	X	X	X	X	X	X	X	X		
-08	B-8		15:00		AP	X	X	X	X	X	X	X	X		
-09	Trip Blank					X									2

Preservative Code:
A = None
B = HCl
C = HNO_3
D = H_2SO_4
E = NaOH
F = MeOH
G = $NaHSO_4$
H = $Na_2S_2O_3$
K/E = Zn Ac/NaOH
O = Other

Container Code
P = Plastic
A = Amber Glass
V = Vial
G = Glass
B = Bacteria Cup
C = Cube
O = Other
E = Encore
D = BOD Bottle

Westboro: Certification No: MA935
Mansfield: Certification No: MA015

Container Type	V	A	P	A	P	P	P	A
Preservative	B	A	A/C	A	E	A	A	A

Relinquished By:	Date/Time	Received By:	Date/Time
A. Platt / Tetra	9/9/2020 1530	[illegible] (AAL)	9/9/2020 1530
[illegible] (AAL)	9/9/2020 1930	[illegible]	9/9/2020 2000
[illegible]	9/10/2020	[illegible]	9/10/2020 0015

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)

Form No: 01-25 HC (rev. 30-Sept-2013)

NEW YORK CHAIN OF CUSTODY

ALPHA ANALYTICAL

Westborough, MA 01581
8 Walkup Dr.
TEL: 508-898-9220
FAX: 508-898-9193

Mansfield, MA 02048
320 Forbes Blvd
TEL: 508-822-9300
FAX: 508-822-3288

Service Centers
Mahwah, NJ 07430: 35 Whitney Rd, Suite 5
Albany, NY 12205: 14 Walker Way
Tonawanda, NY 14150: 275 Cooper Ave, Suite 105

Page 1 of 1

Date Rec'd in Lab: 09/11/20

ALPHA Job #: L2037453

Client Information

Client: Tenen Environmental
Address: 121 West 27th Street Suite 702, NY, NY 10001
Phone: 646-606-7332
Fax:
Email: acarroll@tenenenv.com

Project Information

Project Name: 36-03 Review Ave
Project Location: LIC
Project #
(Use Project name as Project #) ☒
Project Manager: A. Carroll
ALPHAQuote #:

Turn-Around Time

Standard ☒ Due Date:
Rush (only if pre approved) ☐ # of Days:

These samples have been previously analyzed by Alpha ☐

Other project specific requirements/comments:

Cat B deliverables

Please specify Metals or TAL.

Deliverables

☐ ASP-A ☒ ASP-B
☐ EQuIS (1 File) ☐ EQuIS (4 File)
☐ Other

Regulatory Requirement

☒ NY TOGS ☐ NY Part 375
☒ AWQ Standards ☐ NY CP-51
☐ NY Restricted Use ☐ Other
☐ NY Unrestricted Use
☐ NYC Sewer Discharge

Billing Information

☒ Same as Client Info
PO #

Disposal Site Information

Please identify below location of applicable disposal facilities.

Disposal Facility:
☐ NJ ☐ NY
☐ Other

ANALYSIS

Sample Filtration
☐ Done
☐ Lab to do
Preservation
☐ Lab to do
(Please Specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	VOCs	SVOCs	Total + Dissolved Metals	Pesticides/PCBs/Herbicides	Total Cyanide	Trivalent/Hexavalent Chromium	PFAS	1,4-Dioxane	Sample Specific Comments	Total Bottle
37453-01	MW-1S	9/10/2020	10:20	Water	AP	X	X	X	X	X	X	X	X		19
-02	MW-1I		10:10			X	X	X	X	X	X	X	X		19
-03	MW-1D		11:00			X	X	X	X	X	X	X	X		19
-04	MW-4	↓	12:10		↓	X	X	X	X	X	X	X	X		19
-05	Trip Blank			↓		X									2

Preservative Code:
A = None
B = HCl
C = HNO_3
D = H_2SO_4
E = NaOH
F = MeOH
G = $NaHSO_4$
H = $Na_2S_2O_3$
K/E = Zn Ac/NaOH
O = Other

Container Code:
P = Plastic
A = Amber Glass
V = Vial
G = Glass
B = Bacteria Cup
C = Cube
O = Other
E = Encore
D = BOD Bottle

Westboro: Certification No: MA935
Mansfield: Certification No: MA015

Container Type	V	A	P	A	P	P	P	A
Preservative	B	A	A/C	A	E	A	A	A

Relinquished By:	Date/Time	Received By:	Date/Time
A. Platt / Tenen	9/10/2020 1250	[signature] (AAL)	9/10/2020 1250
[signature] (AAL)	9/10/20 1700	[signature]	9/10/20 2000
[signature]	9/11/20 0035	[signature]	9/11/20 00:35

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)

Form No: 01-25 HC (rev. 30-Sept-2013)

Sample Delivery Group Summary

Alpha Job Number : L2037103

Account Name : Tenen Environmental, LLC
Project Number : 36-08 REVIEW AVE
Project Name : 36-08 REVIEW AVE

Received : 08-SEP-2020
Reviewer : Uriel Amparbeng

Delivery Information

Samples Delivered By : Alpha Courier

Chain of Custody : Present

Cooler Information

Cooler	Seal/Seal#	Preservation	Temperature(°C)	Additional Information
A	Absent/	Ice	3.0	
B	Absent/	Ice	2.7	
C	Absent/	Ice	4.1	
D	Absent/	Ice	3.7	
E	Absent/	Ice	2.8	
F	Absent/	Ice	2.3	
G	Absent/	Ice	5.2	

Condition Information

1) All samples on COC received?	YES
2) Extra samples received?	NO
3) Are there any sample container discrepancies?	NO
4) Are there any discrepancies between sample labels & COC? L2037103-06: B-9 vs. B-6	YES
5) Are samples in appropriate containers for requested analysis?	YES
6) Are samples properly preserved for requested analysis?	YES
7) Are samples within holding time for requested analysis?	YES
8) All sampling equipment returned?	NA

Volatile Organics/VPH

1) Reagent Water Vials Frozen by Client?	NO

Sample Delivery Group Summary

Alpha Job Number : L2037315

Account Name : Tenen Environmental, LLC
Project Number : 36-08 REVIEW AVE
Project Name : 36-08 REVIEW AVE

Received : 09-SEP-2020
Reviewer : Majid Abdul

Delivery Information

Samples Delivered By : Alpha Courier

Chain of Custody : Present

Cooler Information

Cooler	Seal/Seal#	Preservation	Temperature(°C)	Additional Information
A	Absent/	Ice	4.2	
B	Absent/	Ice	3.6	
C	Absent/	Ice	3.4	
D	Absent/	Ice	5.1	
E	Absent/	Ice	4.8	

Condition Information

1) All samples on COC received?	YES
2) Extra samples received?	NO
3) Are there any sample container discrepancies?	NO
4) Are there any discrepancies between sample labels & COC?	NO
5) Are samples in appropriate containers for requested analysis?	YES
6) Are samples properly preserved for requested analysis?	YES
7) Are samples within holding time for requested analysis?	YES
8) All sampling equipment returned?	NA

Volatile Organics/VPH

1) Reagent Water Vials Frozen by Client?	NO

Sample Delivery Group Summary

Alpha Job Number : L2037453

Account Name : Tenen Environmental, LLC
Project Number : 36-08 REVIEW AVE
Project Name : 36-08 REVIEW AVE

Received : 10-SEP-2020
Reviewer : Uriel Amparbeng

Delivery Information

Samples Delivered By : Alpha Courier

Chain of Custody : Present

Cooler Information

Cooler	Seal/Seal#	Preservation	Temperature(°C)	Additional Information
A	Absent/	Ice	3.5	
B	Absent/	Ice	5.0	
C	Absent/	Ice	5.2	

Condition Information

1) All samples on COC received?	YES
2) Extra samples received?	NO
3) Are there any sample container discrepancies?	NO
4) Are there any discrepancies between sample labels & COC?	NO
5) Are samples in appropriate containers for requested analysis?	YES
6) Are samples properly preserved for requested analysis?	YES
7) Are samples within holding time for requested analysis?	YES
8) All sampling equipment returned?	NA

Volatile Organics/VPH

1) Reagent Water Vials Frozen by Client?	NO

Appendix B
Case Narratives

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Case Narrative (continued)

Report Submission

September 18, 2020: This final report includes the results of all requested analyses.

September 15, 2020: This is a preliminary report.

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Sample Receipt

L2037103-01 through -06: The sample collection times were obtained from the container labels.

L2037103-06: The sample identified as "B-9" on the chain of custody was identified as "B-6" on the container label. At the client's request, the sample is reported as "B-6".

Semivolatile Organics

The WG1408223-4/-5 MS/MSD recoveries, performed on L2037103-01, are below the acceptance criteria for 3,3'-dichlorobenzidine (0%/0%) and 2,4-dimethylphenol (MS 0%) due to the concentrations of these compounds in the MS/MSD falling below the reported detection limits.

Perfluorinated Alkyl Acids by Isotope Dilution

L2037103-01, -02, -03, -09, and WG1409367-4/-5: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

L2037103-05: The sample has elevated detection limits due to the limited sample volume utilized during extraction, as required by the sample matrix.

Total Metals

L2037103-07: The Field Blank has results for aluminum and sodium present above the reporting limits. The sample was verified as being labeled correctly by the laboratory and the previous analysis showed there was no potential for carry over.

The WG1408118-3 MS recovery, performed on L2037103-01, is outside the acceptance criteria for iron

Case Narrative (continued)

(134%). A post digestion spike was performed and was within acceptance criteria.

Dissolved Metals

L2037103-07: The Field Blank has a result for sodium present above the reporting limit. The sample was verified as being labeled correctly by the laboratory and the previous analysis showed there was no potential for carry over.

The WG1408495-3/-4 MS/MSD recoveries, performed on L2037103-01, are outside the acceptance criteria for calcium (138%/140%) and iron (MS 141%). A post digestion spike was performed and was within acceptance criteria.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Kelly Stenstrom Report Date: 09/18/20

Title: Technical Director/Representative

Data Deliverable Revision Narrative
Alpha SDG: L2037103

March 31, 2021: The Semivolatile Organics Form 3 for MS/MSD has been added to this package.

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Case Narrative (continued)

Report Submission

September 22, 2020: This final report includes the results of all requested analyses.

September 17, 2020: This is a preliminary report.

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Perfluorinated Alkyl Acids by Isotope Dilution

L2037315-05: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

Dissolved Metals

L2037315-06: The sample has elevated detection limits for all elements, with the exception of mercury, due to the dilution required by matrix interferences encountered during analysis.

The WG1408902-1 Method Blank, associated with L2037315-01 through -08, has a concentration above the reporting limit for sodium. Since the associated sample concentrations are greater than 10x the blank concentration for this analyte, no corrective action is required.

The WG1408902-3 MS recovery, performed on L2037315-01, is outside the acceptance criteria for sodium (20%). A post digestion spike was performed and yielded an unacceptable recovery for sodum (76%). The serial dilution recovery was acceptable; therefore, the matrix test passed for the sample matrix.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Melissa Sturgis Report Date: 09/22/20

Title: Technical Director/Representative

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

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Please contact Client Services at 800-624-9220 with any questions.

Case Narrative (continued)

Report Submission

September 24, 2020: This final report includes the results of all requested analyses.

September 17, 2020: This is a preliminary report.

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Semivolatile Organics

L2037453-01: The sample has elevated detection limits due to the dilution required by the sample matrix.

Semivolatile Organics by SIM

L2037453-01: The sample has elevated detection limits due to the dilution required by the sample matrix.

1,4-Dioxane by 8270-SIM

L2037453-01: The sample has elevated detection limits due to the dilution required by the elevated concentrations of non-target compounds in the sample.

Perfluorinated Alkyl Acids by Isotope Dilution

L2037453-01: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

PCBs

L2037453-01: The sample has elevated detection limits due to the dilution required by the sample matrix.

Pesticides

L2037453-01: The sample has elevated detection limits due to the dilution required by the sample matrix.

Cyanide, Total

Case Narrative (continued)

The WG1408975-4 MS recovery, performed on L2037453-01, is outside the acceptance criteria for cyanide, total (77%); however, the associated LCS recovery is within criteria. No further action was taken.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Kelly Stenstrom Report Date: 09/24/20

Title: Technical Director/Representative

Data Deliverable Revision Narrative
Alpha SDG: L2037453

March 31, 2021: The Semivolatile Organics and 1,4-Dioxane CLP forms have been updated t include the data for L2037453-01 in this package.