NAVFAC
Naval Facilities Engineering Command

Groundwater Sample Results, Data Validation Report, and the Sample Location Report, SDG 320-24880

Naval Air Warfare Center Weapons Division China Lake
China Lake, California

November 2019

VALIDATA
Chemical Services, Inc.
2159 Wynnton Pointe, Duluth, GA 30097
(770) 232-0130
(770) 232-5082 (Fax)
www.datavalidator.com

DATA VALIDATION SUMMARY REPORT

COMPANY:	AECOM Technical Services, Inc.
SITE NAME:	NAWS China Lake BGMWP, CTO 005
CONTRACTED LAB:	TestAmerica, Inc.-Sacramento
PROJECT NUMBER:	60432333.1.3
QA/QC LEVELS:	Level III
EPA SOW/METHOD:	EPA SW 846 Methods 8260B, 8260B CALUFT DOD, 8015, EPA Methods 537M, 9056A and 9060A and Standards Methods SM2320B and SM2540C
VALIDATION GUIDELINES:	*DoD Quality Systems Manual for Environmental Laboratories Version 5.0; Approved Laboratory SOPs, EPA National Functional Guidelines for Organic Data Review,* 2010*, EPA National Functional Guidelines for Inorganic Data Review,* 2008, *SW-846* Methods
SAMPLE MATRIX:	Water
TYPE OF ANALYSIS:	Volatile Organic Compounds (VOC), Gasoline Range Organics (GRO), Diesel Range Organics (DRO), Perfluorinated Hydrocarbons, Anions, Alkalinity, Total Dissolved Solids (TDS) and Total Organic Carbon (TOC)
SDG NUMBER:	320-24880-1 (J24880-1)
SAMPLING DATE:	January 9, 2017
REPORT DATE:	March 16, 2017

SAMPLES:

Client Sample #	Lab Sample #	Matrix	VOC	GRO
TT44-MW02-16A	320-24880-1	Water	X	X
26S60E09A01-16A	320-24880-2	Water	X	X
TB-109174-16A	320-24880-3	Water	X	

Client Sample #	Lab Sample #	Matrix	DRO	Perfluorinated Hydrocarbons
TT44-MW02-16A	320-24880-1	Water	X	X
26S60E09A01-16A	320-24880-2	Water	X	X

Client Sample #	Lab Sample #	Matrix	Anions	Alkalinity
TT44-MW02-16A	320-24880-1	Water	X	X
TT44-MW02-16ADL	320-24880-1DL	Water	X	
26S60E09A01-16A	320-24880-2	Water	X	X
26S60E09A01-16ADL1	320-24880-2DL1	Water	X	
26S60E09A01-16ADL2	320-24880-2DL2	Water	X	

Client Sample #	Lab Sample #	Matrix	TDS	TOC
TT44-MW02-16A	320-24880-1	Water	X	X
26S60E09A01-16A	320-24880-2	Water	X	X

SUFFIX CODES – DL = Dilution, MD = Matrix Duplicate, MS = Matrix Spike, MSD = Matrix Spike Duplicate, RA = Reanalysis

PRIMARY REVIEWERS: Amy L. Hogan, Marty McGee

SECONDARY REVIEWER: Kevin C. Harmon

Data Qualifier Reference Table

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the method detection limit.	The analyte was analyzed for, but was not detected above the method detection limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	Not applicable.
UJ	The analyte was not detected above the method detection limit. However, the associated value is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.	The analyte was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.	The data are unusable. The sample results are rejected due to serious deficiencies in meeting the Quality Control (QC) criteria. The analyte may or may not be present in the sample.

Data Qualification Code Reference Table

Qualifier	Organics	Inorganics
H	Holding times were exceeded.	Holding times were exceeded.
S	Surrogate recovery was outside QC limits.	The sequence or number of standards used for the calibration was incorrect.
C	Calibration %RSD, r, r^2 or %D were noncompliant	Correlation coefficient is <0.995.
R	Calibration RRF was <0.05.	%R for calibration is not within control limits
B	Presumed contamination from preparation (method blank)	Presumed contamination from preparation (method) blank or calibration blank
L	Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits	Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits
Q	MS/MSD recovery was poor	MS/MSD recovery was poor.
E	MS/MSD or Duplicate RPD was high.	MS/MSD or Duplicate RPD or difference was high.
I	Internal standard performance was unsatisfactory.	ICP ICS results were unsatisfactory.
A	Not applicable.	ICP Serial Dilution %D were not within control limits
M	Instrument Performance Check (BFB or DFTPP) was noncompliant	Not applicable.
T	Presumed contamination from trip blank.	Not applicable.
F	Presumed contamination from FB or ER.	Presumed contamination from FB or ER.
D	The analysis with this flag should not be used because another more technically sound analysis is available.	The analysis with this flag should not be used because another more technically sound analysis is available.
P	Instrument performance for pesticides was poor	Post Digestion Spike recovery was not within control limits
V	Unusual problems found with the data that have been described in Section 2, "Data Validation Findings." The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.	Unusual problems found with the data that have been described in Section 2, "Data Validation Findings." The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

DATA VALIDATION SUMMARY

TestAmerica, Inc.-Sacramento – 320-24880-1 – Organics & Inorganics

VOLATILE ORGANICS (VOC)

SUMMARY

I.) General:

The analyses for Volatile Organics were performed by Gas Chromatography / Mass Spectrometry (GC / MS) per SW-846 Method 8260B.

II.) Overall Assessment of Data:

All laboratory data were acceptable with qualifications.

MAJOR ISSUES

There were no Major Issues for this SDG.

MINOR ISSUES

I.) Holding Times:

All Holding Time criteria were met. No data qualification was necessary.

II.) GC/MS Tuning:

All GC/MS Tuning criteria were met. No data qualification was necessary.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No data qualification was necessary.

Initial Calibration Verification:

The Percent Difference (%D) for the standards run on 1/16/17 at 16:28 on instrument HP12 exceeded the 20% QC limit for vinyl acetate at -24.3%. Data qualification based on Initial Calibration Verification criteria was not required. No data qualification was necessary.

Continuing Calibration:

The Percent Difference (%D) for the standards run on 1/17/17 at 11:11 on instrument HP12 was -24.7% for acetone, which exceeded the 20% QC limit. All results for this compound in the SDG samples, which consisted entirely of non-detects, were qualified as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no detections in the method blanks associated with this SDG. No data qualification was necessary.

Trip Blank:

There were no detections in the trip blank associated with this SDG. No data qualification was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No data qualification was necessary.

VI.) Laboratory Control Samples (LCS):

One LCS / LCSD set was analyzed by the laboratory. The Relative Percent Differences (RPDs) exceeded the 20% QC limit for acetone at 35%, 1,2,3-trichlorobenzene at 25% and 1,2,4-trichlorobenzene at 24%. Since there were no positive results for these compounds in the SDG samples, no data qualification was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analysis data was not submitted for this fraction of the SDG. Data qualification based on the absence of MS /MSD data was not required. No data qualification was necessary.

VIII.) Field Duplicates:

There were no field duplicate samples identified as part of this SDG. No data qualification was necessary.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No data qualification was necessary.

X.) Internal Standards Performance (ISTD):

All ISTD area count criteria were met. No data qualification was necessary.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL):

Due to issues with the sample foaming during the initial preparation and analysis, SDG sample TT44-MW02-16A was analyzed at a 10X dilution and as such the sample was reported with elevated reporting limits. No data qualification was necessary.

GASOLINE RANGE ORGANICS (GRO)

SUMMARY

I.) General:

The analyses for Gasoline Range Organics (GRO) were performed by Gas Chromatography / Mass Spectrometry (GC / MS) per SW-846 Method 8260B/CALUFT DOD.

II.) Overall Assessment of Data:

All laboratory data were acceptable without qualifications.

MAJOR ISSUES

There were no Major Issues for this SDG.

MINOR ISSUES

I.) Holding Times:

All Holding Time criteria were met. No data qualification was necessary.

II.) GC/MS Tuning:

All GC/MS Tuning criteria were met. No data qualification was necessary.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No data qualification was necessary.

Initial Calibration Verification:

All Initial Calibration Verification criteria were met. No data qualification was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met. No data qualification was necessary.

IV.) Blanks:

There were no detections in the method blanks associated with this fraction of the SDG. No data qualification was necessary.

V.) Surrogate Recoveries:

The Percent Recovery (%R) was 118% for 4-bromofluorobenzene in the LCSD sample, which exceeded the 73-115% QC limit. Since the listed sample was a laboratory QC sample, no data qualification was necessary.

VI.) Laboratory Control Samples (LCS):

One LCS / LCSD set was analyzed by the laboratory. All criteria were met. No data qualification was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analysis data was not submitted for this fraction of the SDG. Data qualification based on the absence of MS/MSD data was not required. No data qualification was necessary.

VIII.) Field Duplicates:

There were no field duplicate samples identified as part of this SDG. No data qualification was necessary.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met. No data qualification was necessary.

X.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL):

Due to issues with the sample foaming during the initial preparation and analysis, SDG sample TT44-MW02-16A was analyzed at a 10X dilution and as such the sample was reported with elevated reporting limits. No data qualification was necessary.

DIESEL RANGE ORGANICS (DRO)

SUMMARY

I.) General:

The analyses for Diesel Range Organics (DRO) were performed by Gas Chromatography per SW-846 Method 8015C for both diesel and motor oil range organics.

II.) Overall Assessment of Data:

All laboratory data were acceptable without qualifications.

MAJOR ISSUES

There were no major problems observed for this fraction of the SDG.

MINOR ISSUES

I.) Holding Times:

All Holding Time criteria were met. No data qualification was necessary.

II.) Instrument Performance:

All Instrument Performance criteria were met. No data qualification was necessary.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No data qualification was necessary.

Initial Calibration Verification:

All Initial Calibration Verification criteria were met. No data qualification was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met. No data qualification was necessary.

IV.) Blanks:

There were no detections in the method blanks associated with this fraction of the SDG. No data qualification was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No data qualification was necessary.

VI.) Laboratory Control Samples (LCS):

One LCS / LCSD set was analyzed by the laboratory. All LCS criteria were met. No data qualification was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analysis data was not submitted for this fraction of the SDG. Data qualification based on the absence of MS / MSD data was not required. No data qualification was necessary.

VIII.) Field Duplicates:

There were no field duplicate samples identified for this SDG. No data qualification was necessary.

IX.) TCL Compound Identification:

All Compound Identification criteria were met. No data qualification was necessary.

X.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL):

All Compound Quantitation and CRQL criteria were met. No data qualification was necessary.

PERFLUORINATED HYDROCARBONS

SUMMARY

I.) General:

The analyses for Perfluorinated Hydrocarbons were performed by Liquid Chromatography / Tandem Mass Spectroscopy per EPA Method 537M.

II.) Overall Assessment of Data:

All laboratory data were acceptable without qualifications.

MAJOR ISSUES

There were no major problems observed for this fraction of the SDG.

MINOR ISSUES

I.) Holding Times:

All Holding Time criteria were met. No data qualification was necessary.

II.) Instrument Performance:

All Instrument Performance criteria were met. No data qualification was necessary.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No data qualification was necessary.

Initial Calibration Verification:

All Initial Calibration Verification criteria were met. No data qualification was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met. No data qualification was necessary.

IV.) Blanks:

There were no detections in the method blanks associated with this fraction of the SDG. No data qualification was necessary.

V.) Surrogate (Isotope Dilution Summary) Recoveries:

All Surrogate Recovery criteria were met. No data qualification was necessary.

VI.) Laboratory Control Samples (LCS):

One LCS / LCSD set was analyzed by the laboratory. All LCS criteria were met. No data qualification was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analysis data was not submitted for this fraction of the SDG. Data qualification based on the absence of MS / MSD data was not required. No data qualification was necessary.

VIII.) Field Duplicates:

There were no field duplicate samples identified for this SDG. No data qualification was necessary.

IX.) TCL Compound Identification:

All Compound Identification criteria were met. No data qualification was necessary.

X.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL):

All Compound Quantitation and CRQL criteria were met. No data qualification was necessary.

ANIONS

SUMMARY

I.) General:

The analyses for Anions were performed per EPA Method 9056A.

II.) Overall Assessment of Data:

All laboratory data were acceptable without qualifications.

MAJOR ISSUES

There were no major problems for this fraction of the SDG.

MINOR ISSUES

I.) Holding Times:

All Holding Time criteria were met. No data qualification was necessary.

II.) Calibration:

All Calibration criteria were met. No data qualification was necessary.

III.) Blanks:

Method and Calibration Blanks:

There were no detections reported in the associated blanks. No data qualification was necessary.

IV.) Laboratory Control Samples (LCS):

Two LCS were analyzed by the laboratory. All LCS criteria were met. No data qualification was necessary.

V.) Matrix Spike / Matrix Duplicate (MS / MD):

MS / MD analyses data were not submitted for this fraction of the SDG. Data qualification based

on the absence of MS/MSD data was not required, so no data qualification was necessary.

VII.) Field Duplicates:

There were no field duplicates identified in this SDG. No data qualification was necessary.

VIII.) Sample Result, Calculation/Transcription Verification:

The results for chloride and or sulfate in the initial analyses for the SDG samples exceeded the linear calibration range. The laboratory analyzed dilutions in the 5X to 50X range for these analytes with all calibration criteria met. The Form I submitted by the laboratory for each of the samples is a composite of the best results, so no data qualification was necessary.

ALKALINITY

SUMMARY

I.) General:

The analyses for Alkalinity were performed per EPA Method SM2320B.

II.) Overall Assessment of Data:

All laboratory data were acceptable without qualifications.

MAJOR ISSUES

There were no major problems for this fraction of the SDG.

MINOR ISSUES

I.) Holding Times:

All Holding Time criteria were met. No data qualification was necessary.

II.) Calibration:

All Calibration criteria were met. No data qualification was necessary.
III.) Blanks:

There were no detections in the associated method blanks. No data qualification was necessary.

IV.) Laboratory Control Samples (LCS):

One LCS was analyzed by the laboratory. All LCS criteria were met. No data qualification was necessary.

V.) Duplicate Sample Analysis:

Duplicate Sample Analysis data was not submitted for this fraction of the SDG. Data qualification based on the absence of MD data was not required, so no data qualification was necessary.

VI.) Field Duplicates:

There were no field duplicates identified in this SDG. No data qualification was necessary.

VIII.) Sample Result, Calculation/Transcription Verification:

All Sample Result criteria were met. No data qualification was necessary.

TOTAL DISSOLVED SOLIDS

SUMMARY

I.) General:

The analyses for Total Dissolved Solids were performed per SM Method 2540C.

II.) Overall Assessment of Data:

All laboratory data were acceptable without qualifications.

MAJOR ISSUES

No major problems were observed in this fraction of the SDG.

MINOR ISSUES

I.) Holding Times:

All Holding Time criteria were met. No data qualification was necessary.

II.) Calibration:

Calibration criteria were not required for this fraction of the SDG. No data qualification was necessary.

III.) Blanks:

There were no detections in the blanks associated with this fraction of the SDG. No data

qualification was necessary.

IV.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analysis data was not submitted for this fraction of the SDG. Data qualification based on the absence of MS / MSD data was not required. No data qualification was necessary.

V.) Laboratory Control Sample (LCS):

One LCS was analyzed for this SDG. All LCS criteria were met. No data qualification was necessary.

VI.) Field Duplicates:

There were no field duplicate samples identified for this SDG. No data qualification was necessary.

VIII.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL):

All Compound Quantitation and CRQL criteria were met. No data qualification was necessary.

TOTAL ORGANIC CARBON

SUMMARY

I.) General:

The analyses for Total Organic Carbon (TOC) were per EPA Method SM5310B.

II.) Overall Assessment of Data:

All laboratory data were acceptable without qualifications.

MAJOR ISSUES

There were no major problems for this fraction of the SDG.

MINOR ISSUES

I.) Holding Times:

All Holding Time criteria were met. No data qualification was necessary.

II.) Calibration:

All Calibration criteria were met. No data qualification was necessary.

III.) Blanks:

Method Blanks:

Total Organic Carbon (TOC) was detected at 213 ug/L in associated method blank MB 280-358691/39. Since the method blank result is less than one half the LOQ, no data qualification was necessary.

Calibration Blanks:

Total Organic Carbon (TOC) was detected in the following continuing calibration blanks:

1/12/17 @ 17:59	0.226 mg/L
1/12/17 @ 21:01	0.191 mg/L
1/13/17 @ 00:11	0.231 mg/L
1/13/17 @ 03:13	0.186 mg/L
1/13/17 @ 03:59	0.188 mg/L

Since the blank results were less than one half the LOQ, no data qualification was necessary.

IV.) Laboratory Control Samples (LCS):

One LCS were analyzed by the laboratory. All LCS criteria were met. No data qualification was necessary.

V.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses data was not submitted for this fraction of the SDG. Data qualification based on the absence of MS / MSD data was not required. No data qualification was necessary.

VII.) Field Duplicates:

There were no field duplicates identified in this SDG. No data qualification was necessary.

VIII.) Sample Result, Calculation/Transcription Verification:

All Sample Result criteria were met. No data qualification was necessary.

Appendix A
Qualified Form Is

Client Sample Results

Client: AECOM, Inc.
Project/Site: China Lake, Project# 60432333.1.3

TestAmerica Job ID: 320-24880-1

Client Sample ID: TT44-MW02-16A

Date Collected: 01/09/17 11:15
Date Received: 01/10/17 11:10

Lab Sample ID: 320-24880-1
Matrix: Water

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C4-C12	300	U	500	150	ug/L			01/17/17 19:04	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*73 - 115*		*01/17/17 19:04*	*10*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	4.0	U	10	1.9	ug/L			01/17/17 19:04	10
1,1,2,2-Tetrachloroethane	4.0	U	10	1.5	ug/L			01/17/17 19:04	10
1,1,2-Trichloroethane	8.0	U	10	3.1	ug/L			01/17/17 19:04	10
1,1-DCA	4.0	U	10	1.5	ug/L			01/17/17 19:04	10
1,1-Dichlorethylene	4.0	U	10	1.4	ug/L			01/17/17 19:04	10
1,2-DCA	5.0	U	10	2.2	ug/L			01/17/17 19:04	10
1,2-Dichloropropane	4.0	U	10	1.5	ug/L			01/17/17 19:04	10
2-Butanone	8.0	U	20	3.5	ug/L			01/17/17 19:04	10
2-Hexanone	4.0	U	20	1.7	ug/L			01/17/17 19:04	10
4-Methyl-2-pentanone (MIBK)	4.0	U	20	1.8	ug/L			01/17/17 19:04	10
Acetone	50	~~U~~ Q UJ	100	21	ug/L			01/17/17 19:04	10
Benzene	4.0	U	10	1.3	ug/L			01/17/17 19:04	10
Bromodichloromethane	4.0	U	10	1.4	ug/L			01/17/17 19:04	10
Bromoform	4.0	U	10	1.0	ug/L			01/17/17 19:04	10
Bromomethane	8.0	U	10	2.9	ug/L			01/17/17 19:04	10
Carbon disulfide	4.0	U	20	1.6	ug/L			01/17/17 19:04	10
Carbon tetrachloride	4.0	U	10	1.5	ug/L			01/17/17 19:04	10
Chlorobenzene	4.0	U	10	1.2	ug/L			01/17/17 19:04	10
Chloroethane	8.0	U	10	3.4	ug/L			01/17/17 19:04	10
Chloroform	4.0	U	10	1.2	ug/L			01/17/17 19:04	10
Chloromethane	8.0	U	10	2.5	ug/L			01/17/17 19:04	10
cis-1,2-Dichloroethene	4.0	U	10	1.0	ug/L			01/17/17 19:04	10
cis-1,3-Dichloropropene	8.0	U	10	2.2	ug/L			01/17/17 19:04	10
Dibromochloromethane	4.0	U	10	1.3	ug/L			01/17/17 19:04	10
Ethylbenzene	4.0	U	10	1.5	ug/L			01/17/17 19:04	10
m-Xylene & p-Xylene	4.0	U	10	1.8	ug/L			01/17/17 19:04	10
Methylene Chloride	8.0	U	10	3.5	ug/L			01/17/17 19:04	10
o-Xylene	4.0	U	10	1.0	ug/L			01/17/17 19:04	10
Styrene	4.0	U	10	1.5	ug/L			01/17/17 19:04	10
Tetrachloroethene (PCE)	4.0	U	10	1.5	ug/L			01/17/17 19:04	10
Toluene	8.0	U	10	2.5	ug/L			01/17/17 19:04	10
trans-1,2-Dichloroethene	4.0	U	10	1.1	ug/L			01/17/17 19:04	10
trans-1,3-Dichloropropene	4.0	U	10	1.5	ug/L			01/17/17 19:04	10
Trichloroethene (TCE)	4.0	U	10	1.3	ug/L			01/17/17 19:04	10
Vinyl chloride	8.0	U	10	2.2	ug/L			01/17/17 19:04	10
1,2-Dichloroethene, Total	8.0	U	10	2.0	ug/L			01/17/17 19:04	10
Methyl-tert-butyl Ether (MTBE)	4.0	U	20	1.9	ug/L			01/17/17 19:04	10
Vinyl acetate	8.0	U	20	2.1	ug/L			01/17/17 19:04	10
Xylenes, Total	12	U	15	1.8	ug/L			01/17/17 19:04	10
1,1,1,2-Tetrachloroethane	4.0	U	10	1.0	ug/L			01/17/17 19:04	10
1,2,3-Trichlorobenzene	4.0	U ~~Q~~	10	1.4	ug/L			01/17/17 19:04	10
1,2,3-Trichloropropane	4.0	U	10	1.3	ug/L			01/17/17 19:04	10

1/31/2017
3/16/17

Client Sample ID: TT44-MW02-16A
Date Collected: 01/09/17 11:15
Date Received: 01/10/17 11:10

Lab Sample ID: 320-24880-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	4.0	U Q	10	1.0	ug/L			01/17/17 19:04	10
1,2,4-Trimethylbenzene	4.0	U	10	1.2	ug/L			01/17/17 19:04	10
1,3,5-Trimethylbenzene	4.0	U	10	1.4	ug/L			01/17/17 19:04	10
Di-isopropyl ether (DIPE)	4.0	U	20	1.5	ug/L			01/17/17 19:04	10
Ethyl tert-butyl ether	4.0	U	20	1.5	ug/L			01/17/17 19:04	10
Naphthalene	**3.3**	**J D**	10	1.5	ug/L			01/17/17 19:04	10
N-Propylbenzene	4.0	U	10	1.5	ug/L			01/17/17 19:04	10
Tert-amyl methyl ether	4.0	U	20	1.5	ug/L			01/17/17 19:04	10
tert-Butyl alcohol (TBA)	100	U	500	43	ug/L			01/17/17 19:04	10
Trichlorofluoromethane	8.0	U	10	2.3	ug/L			01/17/17 19:04	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*81 - 118*		*01/17/17 19:04*	*10*
4-Bromofluorobenzene (Surr)	*102*		*85 - 114*		*01/17/17 19:04*	*10*
Dibromofluoromethane (Surr)	*98*		*80 - 119*		*01/17/17 19:04*	*10*
Toluene-d8 (Surr)	*96*		*89 - 112*		*01/17/17 19:04*	*10*

Method: 8015B DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	**1300**		48	15	ug/L		01/13/17 13:41	01/18/17 17:23	1
Motor Oil Range Organics [C28-C40]	380	U	480	160	ug/L		01/13/17 13:41	01/18/17 17:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*97*		*56 - 125*	*01/13/17 13:41*	*01/18/17 17:23*	*1*

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**200**	**D**	20	0.74	mg/L			01/11/17 18:14	20
Nitrate as N	0.15	U	0.25	0.11	mg/L			01/10/17 17:13	5
Nitrite as N	0.15	U	0.25	0.080	mg/L			01/10/17 17:13	5
Sulfate	**12**	**D**	5.0	0.25	mg/L			01/10/17 17:13	5
Orthophosphate as P	0.75	U	1.0	0.39	mg/L			01/10/17 17:13	5

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	1.9	U	2.4	0.73	ng/L		01/17/17 10:41	01/18/17 11:57	1
Perfluorooctanesulfonic acid (PFOS)	2.9	U	3.9	1.2	ng/L		01/17/17 10:41	01/18/17 11:57	1
Perfluorobutanesulfonic acid (PFBS)	1.9	U	2.4	0.89	ng/L		01/17/17 10:41	01/18/17 11:57	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*101*		*25 - 150*	*01/17/17 10:41*	*01/18/17 11:57*	*1*
13C4 PFOS	*121*		*25 - 150*	*01/17/17 10:41*	*01/18/17 11:57*	*1*
18O2 PFHxS	*107*		*25 - 150*	*01/17/17 10:41*	*01/18/17 11:57*	*1*

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Quad	**3200**		1000	160	ug/L			01/13/17 02:42	1
Bicarbonate Alkalinity	**450000**		5000	5000	ug/L			01/11/17 15:51	1
Total Dissolved Solids	**970000**		10000	5400	ug/L			01/11/17 09:45	1

1/31/2017
3/16/17

Client Sample Results

Client: AECOM, Inc.
Project/Site: China Lake, Project# 60432333.1.3

TestAmerica Job ID: 320-24880-1

Client Sample ID: 26S60E09A01-16A

Date Collected: 01/09/17 12:20
Date Received: 01/10/17 11:10

Lab Sample ID: 320-24880-2

Matrix: Water

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C4-C12	30	U	50	15	ug/L			01/17/17 17:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*105*		*73 - 115*		*01/17/17 17:33*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	0.40	U	1.0	0.19	ug/L			01/17/17 17:33	1
1,1,2,2-Tetrachloroethane	0.40	U	1.0	0.15	ug/L			01/17/17 17:33	1
1,1,2-Trichloroethane	0.80	U	1.0	0.31	ug/L			01/17/17 17:33	1
1,1-DCA	0.40	U	1.0	0.15	ug/L			01/17/17 17:33	1
1,1-Dichlorethylene	0.40	U	1.0	0.14	ug/L			01/17/17 17:33	1
1,2-DCA	0.50	U	1.0	0.22	ug/L			01/17/17 17:33	1
1,2-Dichloropropane	0.40	U	1.0	0.15	ug/L			01/17/17 17:33	1
2-Butanone	0.80	U	2.0	0.35	ug/L			01/17/17 17:33	1
2-Hexanone	0.40	U	2.0	0.17	ug/L			01/17/17 17:33	1
4-Methyl-2-pentanone (MIBK)	0.40	U	2.0	0.18	ug/L			01/17/17 17:33	1
Acetone	5.0	~~U~~ Q LCS	10	2.1	ug/L			01/17/17 17:33	1 C
Benzene	0.40	U	1.0	0.13	ug/L			01/17/17 17:33	1
Bromodichloromethane	0.40	U	1.0	0.14	ug/L			01/17/17 17:33	1
Bromoform	0.40	U	1.0	0.10	ug/L			01/17/17 17:33	1
Bromomethane	0.80	U	1.0	0.29	ug/L			01/17/17 17:33	1
Carbon disulfide	0.40	U	2.0	0.16	ug/L			01/17/17 17:33	1
Carbon tetrachloride	0.40	U	1.0	0.15	ug/L			01/17/17 17:33	1
Chlorobenzene	0.40	U	1.0	0.12	ug/L			01/17/17 17:33	1
Chloroethane	0.80	U	1.0	0.34	ug/L			01/17/17 17:33	1
Chloroform	0.40	U	1.0	0.12	ug/L			01/17/17 17:33	1
Chloromethane	0.80	U	1.0	0.25	ug/L			01/17/17 17:33	1
cis-1,2-Dichloroethene	0.40	U	1.0	0.10	ug/L			01/17/17 17:33	1
cis-1,3-Dichloropropene	0.80	U	1.0	0.22	ug/L			01/17/17 17:33	1
Dibromochloromethane	0.40	U	1.0	0.13	ug/L			01/17/17 17:33	1
Ethylbenzene	0.40	U	1.0	0.15	ug/L			01/17/17 17:33	1
m-Xylene & p-Xylene	0.40	U	1.0	0.18	ug/L			01/17/17 17:33	1
Methylene Chloride	0.80	U	1.0	0.35	ug/L			01/17/17 17:33	1
o-Xylene	0.40	U	1.0	0.10	ug/L			01/17/17 17:33	1
Styrene	0.40	U	1.0	0.15	ug/L			01/17/17 17:33	1
Tetrachloroethene (PCE)	0.40	U	1.0	0.15	ug/L			01/17/17 17:33	1
Toluene	0.80	U	1.0	0.25	ug/L			01/17/17 17:33	1
trans-1,2-Dichloroethene	0.40	U	1.0	0.11	ug/L			01/17/17 17:33	1
trans-1,3-Dichloropropene	0.40	U	1.0	0.15	ug/L			01/17/17 17:33	1
Trichloroethene (TCE)	0.40	U	1.0	0.13	ug/L			01/17/17 17:33	1
Vinyl chloride	0.80	U	1.0	0.22	ug/L			01/17/17 17:33	1
1,2-Dichloroethene, Total	0.80	U	1.0	0.20	ug/L			01/17/17 17:33	1
Methyl-tert-butyl Ether (MTBE)	0.40	U	2.0	0.19	ug/L			01/17/17 17:33	1
Vinyl acetate	0.80	U	2.0	0.21	ug/L			01/17/17 17:33	1
Xylenes, Total	1.2	U	1.5	0.18	ug/L			01/17/17 17:33	1
1,1,1,2-Tetrachloroethane	0.40	U	1.0	0.10	ug/L			01/17/17 17:33	1
1,2,3-Trichlorobenzene	0.40	U Q-	1.0	0.14	ug/L			01/17/17 17:33	1
1,2,3-Trichloropropane	0.40	U	1.0	0.13	ug/L			01/17/17 17:33	1

1/31/2017
31/1/17

Client Sample ID: 26S60E09A01-16A

Date Collected: 01/09/17 12:20
Date Received: 01/10/17 11:10

Lab Sample ID: 320-24880-2

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	0.40	U	1.0	0.10	ug/L			01/17/17 17:33	1
1,2,4-Trimethylbenzene	0.40	U	1.0	0.12	ug/L			01/17/17 17:33	1
1,3,5-Trimethylbenzene	0.40	U	1.0	0.14	ug/L			01/17/17 17:33	1
Di-isopropyl ether (DIPE)	0.40	U	2.0	0.15	ug/L			01/17/17 17:33	1
Ethyl tert-butyl ether	0.40	U	2.0	0.15	ug/L			01/17/17 17:33	1
Naphthalene	0.40	U	1.0	0.15	ug/L			01/17/17 17:33	1
N-Propylbenzene	0.40	U	1.0	0.15	ug/L			01/17/17 17:33	1
Tert-amyl methyl ether	0.40	U	2.0	0.15	ug/L			01/17/17 17:33	1
tert-Butyl alcohol (TBA)	10	U	50	4.3	ug/L			01/17/17 17:33	1
Trichlorofluoromethane	0.80	U	1.0	0.23	ug/L			01/17/17 17:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*81 - 118*		*01/17/17 17:33*	*1*
4-Bromofluorobenzene (Surr)	*105*		*85 - 114*		*01/17/17 17:33*	*1*
Dibromofluoromethane (Surr)	*98*		*80 - 119*		*01/17/17 17:33*	*1*
Toluene-d8 (Surr)	*93*		*89 - 112*		*01/17/17 17:33*	*1*

Method: 8015B DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	**26**	**J**	48	15	ug/L		01/13/17 13:41	01/18/17 17:42	1
Motor Oil Range Organics [C28-C40]	380	U	480	160	ug/L		01/13/17 13:41	01/18/17 17:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*90*		*56 - 125*	*01/13/17 13:41*	*01/18/17 17:42*	*1*

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**150**	**D**	20	0.74	mg/L			01/11/17 18:25	20
Nitrate as N	**0.28**		0.050	0.022	mg/L			01/10/17 17:25	1
Nitrite as N	0.030	U	0.050	0.016	mg/L			01/10/17 17:25	1
Sulfate	**78**	**D**	5.0	0.25	mg/L			01/11/17 19:34	5
Orthophosphate as P	0.15	U	0.20	0.077	mg/L			01/10/17 17:25	1

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**1.3**	**J M**	2.4	0.71	ng/L		01/17/17 10:41	01/18/17 12:04	1
Perfluorooctanesulfonic acid (PFOS)	2.9	U M	3.8	1.2	ng/L		01/17/17 10:41	01/18/17 12:04	1
Perfluorobutanesulfonic acid (PFBS)	1.9	U M	2.4	0.88	ng/L		01/17/17 10:41	01/18/17 12:04	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*65*		*25 - 150*	*01/17/17 10:41*	*01/18/17 12:04*	*1*
13C4 PFOS	*125*		*25 - 150*	*01/17/17 10:41*	*01/18/17 12:04*	*1*
18O2 PFHxS	*122*		*25 - 150*	*01/17/17 10:41*	*01/18/17 12:04*	*1*

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Quad	**670**	**J**	1000	160	ug/L			01/13/17 03:27	1
Bicarbonate Alkalinity	**150000**		5000	5000	ug/L			01/11/17 15:59	1
Total Dissolved Solids	**590000**		10000	5400	ug/L			01/11/17 09:45	1

1/31/2017
3/14/17

Client Sample ID: TB-10917-16A
Date Collected: 01/09/17 00:00
Date Received: 01/10/17 11:10

Lab Sample ID: 320-24880-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	0.40	U	1.0	0.19	ug/L			01/17/17 16:48	1
1,1,2,2-Tetrachloroethane	0.40	U	1.0	0.15	ug/L			01/17/17 16:48	1
1,1,2-Trichloroethane	0.80	U	1.0	0.31	ug/L			01/17/17 16:48	1
1,1-DCA	0.40	U	1.0	0.15	ug/L			01/17/17 16:48	1
1,1-Dichlorethylene	0.40	U	1.0	0.14	ug/L			01/17/17 16:48	1
1,2-DCA	0.50	U	1.0	0.22	ug/L			01/17/17 16:48	1
1,2-Dichloropropane	0.40	U	1.0	0.15	ug/L			01/17/17 16:48	1
2-Butanone	0.80	U	2.0	0.35	ug/L			01/17/17 16:48	1
2-Hexanone	0.40	U	2.0	0.17	ug/L			01/17/17 16:48	1
4-Methyl-2-pentanone (MIBK)	0.40	U	2.0	0.18	ug/L			01/17/17 16:48	1
Acetone	5.0	U Q	10	2.1	ug/L			01/17/17 16:48	1
Benzene	0.40	U	1.0	0.13	ug/L			01/17/17 16:48	1
Bromodichloromethane	0.40	U	1.0	0.14	ug/L			01/17/17 16:48	1
Bromoform	0.40	U	1.0	0.10	ug/L			01/17/17 16:48	1
Bromomethane	0.80	U	1.0	0.29	ug/L			01/17/17 16:48	1
Carbon disulfide	0.40	U	2.0	0.16	ug/L			01/17/17 16:48	1
Carbon tetrachloride	0.40	U	1.0	0.15	ug/L			01/17/17 16:48	1
Chlorobenzene	0.40	U	1.0	0.12	ug/L			01/17/17 16:48	1
Chloroethane	0.80	U	1.0	0.34	ug/L			01/17/17 16:48	1
Chloroform	0.40	U	1.0	0.12	ug/L			01/17/17 16:48	1
Chloromethane	0.80	U	1.0	0.25	ug/L			01/17/17 16:48	1
cis-1,2-Dichloroethene	0.40	U	1.0	0.10	ug/L			01/17/17 16:48	1
cis-1,3-Dichloropropene	0.80	U	1.0	0.22	ug/L			01/17/17 16:48	1
Dibromochloromethane	0.40	U	1.0	0.13	ug/L			01/17/17 16:48	1
Ethylbenzene	0.40	U	1.0	0.15	ug/L			01/17/17 16:48	1
m-Xylene & p-Xylene	0.40	U	1.0	0.18	ug/L			01/17/17 16:48	1
Methylene Chloride	0.80	U	1.0	0.35	ug/L			01/17/17 16:48	1
o-Xylene	0.40	U	1.0	0.10	ug/L			01/17/17 16:48	1
Styrene	0.40	U	1.0	0.15	ug/L			01/17/17 16:48	1
Tetrachloroethene (PCE)	0.40	U	1.0	0.15	ug/L			01/17/17 16:48	1
Toluene	0.80	U	1.0	0.25	ug/L			01/17/17 16:48	1
trans-1,2-Dichloroethene	0.40	U	1.0	0.11	ug/L			01/17/17 16:48	1
trans-1,3-Dichloropropene	0.40	U	1.0	0.15	ug/L			01/17/17 16:48	1
Trichloroethene (TCE)	0.40	U	1.0	0.13	ug/L			01/17/17 16:48	1
Vinyl chloride	0.80	U	1.0	0.22	ug/L			01/17/17 16:48	1
1,2-Dichloroethene, Total	0.80	U	1.0	0.20	ug/L			01/17/17 16:48	1
Methyl-tert-butyl Ether (MTBE)	0.40	U	2.0	0.19	ug/L			01/17/17 16:48	1
Vinyl acetate	0.80	U	2.0	0.21	ug/L			01/17/17 16:48	1
Xylenes, Total	1.2	U	1.5	0.18	ug/L			01/17/17 16:48	1
1,1,1,2-Tetrachloroethane	0.40	U	1.0	0.10	ug/L			01/17/17 16:48	1
1,2,3-Trichlorobenzene	0.40	U Q	1.0	0.14	ug/L			01/17/17 16:48	1
1,2,3-Trichloropropane	0.40	U	1.0	0.13	ug/L			01/17/17 16:48	1
1,2,4-Trichlorobenzene	0.40	U Q	1.0	0.10	ug/L			01/17/17 16:48	1
1,2,4-Trimethylbenzene	0.40	U	1.0	0.12	ug/L			01/17/17 16:48	1
1,3,5-Trimethylbenzene	0.40	U	1.0	0.14	ug/L			01/17/17 16:48	1
Di-isopropyl ether (DIPE)	0.40	U	2.0	0.15	ug/L			01/17/17 16:48	1
Ethyl tert-butyl ether	0.40	U	2.0	0.15	ug/L			01/17/17 16:48	1
Naphthalene	0.40	U	1.0	0.15	ug/L			01/17/17 16:48	1
N-Propylbenzene	0.40	U	1.0	0.15	ug/L			01/17/17 16:48	1

1/31/2017

Client Sample ID: TB-10917-16A
Date Collected: 01/09/17 00:00
Date Received: 01/10/17 11:10

Lab Sample ID: 320-24880-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Tert-amyl methyl ether	0.40	U	2.0	0.15	ug/L			01/17/17 16:48	1
tert-Butyl alcohol (TBA)	10	U	50	4.3	ug/L			01/17/17 16:48	1
Trichlorofluoromethane	0.80	U	1.0	0.23	ug/L			01/17/17 16:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*81 - 118*		*01/17/17 16:48*	*1*
4-Bromofluorobenzene (Surr)	*104*		*85 - 114*		*01/17/17 16:48*	*1*
Dibromofluoromethane (Surr)	*96*		*80 - 119*		*01/17/17 16:48*	*1*
Toluene-d8 (Surr)	*97*		*89 - 112*		*01/17/17 16:48*	*1*

LOCATION_NAME	SITE_NAME	INSTALLATION_ID	LOCATION_TYPE	LOCATION_TYPE_DESC	SDG	COORD_X	COORD_Y	ANALYTICAL_METHOD_GRP_DESC	SAMPLE_NAME	SAMPLE_MATRIX	SAMPLE_MATRIX_DESC	COLLECT_DATE
26S40E09A01	SITE 00044	CHINA_LAKE_NAWS	WLM	Monitoring well	320-24880-1	6659323.1	2439363.8	Perfluoroalkyl Compounds	26S60E09A01-16A	WG	Ground water	09-Jan-17
TT44-MW02	SITE 00044	CHINA_LAKE_NAWS	WLM	Monitoring well	320-24880-1	6659518.4	2438749	Perfluoroalkyl Compounds	TT44-MW02-16A	WG	Ground water	09-Jan-17
TT44-MW02	SITE 00044	CHINA_LAKE_NAWS	WLM	Monitoring well	320-24880-1	6659518.4	2438749	Perfluoroalkyl Compounds	TT44-MW02-16A	WG	Ground water	09-Jan-17
26S40E09A01	SITE 00044	CHINA_LAKE_NAWS	WLM	Monitoring well	320-24880-1	6659323.1	2439363.8	Perfluoroalkyl Compounds	26S60E09A01-16A	WG	Ground water	09-Jan-17
26S40E09A01	SITE 00044	CHINA_LAKE_NAWS	WLM	Monitoring well	320-24880-1	6659323.1	2439363.8	Perfluoroalkyl Compounds	26S60E09A01-16A	WG	Ground water	09-Jan-17
TT44-MW02	SITE 00044	CHINA_LAKE_NAWS	WLM	Monitoring well	320-24880-1	6659518.4	2438749	Perfluoroalkyl Compounds	TT44-MW02-16A	WG	Ground water	09-Jan-17