PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Date: September 18, 2019

To: Rob Ede
Hahn and Associates Inc.

From: Jeanne Peterson
Project Manager, AQA

Subject: Data Validation
Gasco Mult 802 Decommissioning
Apex Laboratories, LLC Work Order A9F0860

SUMMARY

Level II (i.e., EPA Stage 2A) data validation was performed on the data for two water samples prepared and analyzed using approved procedures for method SW846 8260C (VOCs) and one water sample prepared and analyzed using approved procedures for methods SW846 8270D (SVOCs), NWTPH-Gx (gasoline range organics [GRO]), NWTPH-Dx (diesel and oil), SW846 6020A (metals by ICPMS), EPA 335.4 (total cyanide), OIA/D6888 (available cyanide), and ASTM D4282 (free cyanide). Data were reported for all requested analytes.

The analytical data were evaluated in accordance with the *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (October 1999) and the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (February 1994) (NFG, collectively), and the applicable methods.

In general, the data are valid as reported. No data were rejected. Other qualifiers were applied to the data as specified in the Data Qualifiers section below.

See attached data validation spreadsheets for supporting documentation on the data review and validation.

SAMPLES

The samples included in this validation are listed below.

Sample ID	APEX Sample ID	Analysis	Matrix
2708-190626-MULT802-TB	A9F0860-01	VOCs	Water
2708-190626-MULT802-109	A9F0860-02	VOCs, SVOCs, GRO, DRO, Total Metals, Total CN, Available CN, Free CN	Water

DATA QUALIFIERS (see following sections for detailed explanations)

Sample ID	Method	Analyte	Qualifier	Qualifier Code	Reason for Qualification
2708-190626-MULT802-109	8260C	Chloromethane	UJ	10	Low laboratory control sample recovery

DISCUSSION

Sample Shipping/Receiving

All COC, analysis request, and sample receipt documentation was complete and correct with the following exceptions.

The sample receipt section of the COCs was not completed; the information was documented on the Cooler Receipt Form.

The receiving laboratory name was not documented in the correct block on the COC.

It should be noted that one of the two unpreserved amber liter bottles was received with a cracked lid. This bottle was not used for analysis; therefore, no sample results were qualified.

Holding Times and Preservation

The samples were properly preserved and analyzed within the prescribed holding times with the following exceptions.

Methods 8260C and NWTPH-Gx

The pH of the samples at the time of analysis was not included in the Level II data package. There were no preservation problems noted by the laboratory; therefore, it was assumed that the samples were properly preserved and no data were qualified.

Blanks

No target analytes were detected in the method blanks or trip blank. Field blanks were not collected with the samples in this work order.

Surrogates

All surrogate recoveries were within laboratory QC acceptance criteria with the following exceptions.

Method 8270D

The phenol-d6 recoveries were <10% for the method blank, LCS, and LCSD. The associated sample acid results were non-detects and would not be affected by any lost acid target analytes in the method blank, and the LCS recoveries for the acid target analytes were within acceptance criteria; therefore, no sample results were qualified based on professional judgment.

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

The LCS/LCSD analyses met laboratory QC acceptance criteria with the following exceptions.

Method 8260C

The LCS recoveries associated with batch 9061358 were > the upper acceptance limit for 2-butanone and trichlorofluoromethane. The associated sample results were non-detects and not affected by the high bias and, therefore, were not qualified based on professional judgment.

The LCS recovery associated with batch 9061478 was < the lower acceptance limit but ≥30% for chloromethane. The associated sample result was a non-detect and, therefore, was **qualified UJ**.

Method 8270D

The LCS recovery was > the upper acceptance limit for 4,6-dinitro-2-methylphenol. The associated sample result was a non-detect and not affected by the high bias and, therefore, was not qualified based on professional judgment.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD analyses met laboratory QC acceptance criteria with the following exceptions.

Method 8260C

The MS recoveries associated with batch 9061358 were > the upper acceptance limit for bromodichloromethane; Chloroethane; 1,2-dichloroethane; 1,1-dichloroethene; cis-1,2-dichloroethene; and trans-1,2-dichloroethene. The MS analyses were performed on non-project samples; therefore, no sample results were qualified based on professional judgment.

The MS recovery associated with batch 9061478 was > the upper acceptance limit for naphthalene. The parent sample concentration was >4X the spike amount; therefore, no sample results were qualified based on professional judgment.

Methods 8270D, NWTPH-Gx, and NWTPH-Dx

An MS analysis was not performed with the samples in this work order; therefore, matrix-specific accuracy data were not available.

Method 6020A

The MS recovery was outside of the acceptance limits for aluminum. The parent sample concentration was >4X the spike amount; therefore, no sample results were qualified based on professional judgment. It should be noted that the MS analyses were performed on non-project samples.

Method EPA 335.4

It should be noted that the MS analysis was performed on a non-project sample.

Laboratory Duplicate

The laboratory duplicate analyses (LCS/LCSD, MS/MSD, and/or sample/duplicate) were within laboratory QC acceptance criteria.

Methods 8260C and NWTPH-Gx

It should be noted that the laboratory duplicate analysis associated with batch 9061358 was performed on a non-project sample.

Method EPA 335.4

It should be noted that the laboratory duplicate analyses were performed on non-project samples.

Field Duplicate

A field duplicate was not collected with the samples in this data package.

Reporting Limits

All reporting limits (RLs) were properly reported. Sample 2708-190626-MULT802-109 was diluted 10X for VOCs, SVOCs, and GRO. Reporting limits were adjusted accordingly.

Other QC

Method NWTPH-Dx

The laboratory noted that no fuel pattern was detected for sample 2708-190626-MULT802-109. The diesel results represent carbon range C12 to C24, and the oil results represent >C24 to C40. Because this could not be verified with a Level II data package, the sample results were not qualified by the validator; however, the end user of the results should be aware that the results were considered to be estimated.

No other specific issues that affect data quality were identified.

Hahn Data Validation Summary Worksheet

SDG#: A9F0860	Laboratory: Apex	Validator: Jeanne Peterson	Validation Date: 08/29/2019
Site: Mult 802 Decommissioning	COC#: 1		Validation Level: ☒ II ☐ III
Matrix: Water	# of Samples: 2	Tracking docs present: See sample receipt and log-in documentation	
COCs present: Yes	COCs signed: Yes	COCs dated: Yes	Sample Container Integrity: OK

Analyses:
☒ VOCs ☒ SVOCs ☐ PAHs ☒ GRO ☒ DRO ☐ Pests ☐ PCBs ☒ Metals ☐ Gen Chem ☒ Cyanide
☐ Other: VPH/EPH

Requested Analyses Not Reported

Client Sample ID	Lab Sample ID	Analysis	Comments
None			

Hold Time/Preservation Outliers

Client Sample ID	Lab Sample ID	Analysis	Pres.	Collection Date	Preparation Date	Analysis Date	Analysis <2X HT	Analysis ≥2X HT
None								

Comments: Samples collected 06/26/2019
Temp and containers not completed on COC; documented on Cooler Receipt Form.
Received by lab name not in correct box.
1 of 2 unpreserved amber bottles received with cracked lid; not used for analysis.

Hahn Level III GCMS Worksheet

SDG: A9F0860	Method: 8260C	Matrix: Water	Lab Sample ID: A9F0860-01, -02
Seq/Batch #s: --/9061358, 9061478			

Tuning: ☐ Pass ☐ Fail TICs Required? ☐ Yes ☒ No *(lab limits)* *(lab limits)*

Analyte (outliers)	Calibration				Method Blank	5X (10X) Method Blank	LCS %R	MS %R	MSD %R	MS/ MSD RPD	LAB DUP RPD	TB		
	RF ≥0.05	RSD/r² ≤30% ≥0.990	ICV[1] %D ±25%	CCV %D ±25%										
9061358														
2-Butanone					✓	NA	123	✓	NA	NA	✓	✓		
Trichlorofluoromethane					✓	NA	122	✓	NA	NA	✓	✓		
Bromodichloromethane					✓	NA	✓	126	NA	NA	✓	✓		
Chloroethane					✓	NA	✓	152	NA	NA	✓	✓		
1,2-Dichloroethane					✓	NA	✓	129	NA	NA	✓	✓		
1,1-Dichloroethene					✓	NA	✓	132	NA	NA	✓	✓		
cis-1,2-Dichloroethene					✓	NA	✓	125	NA	NA	✓	✓		
trans-1,2-Dichloroethene					✓	NA	✓	125	NA	NA	✓	✓		
9061478														
Chloromethane					✓	NA	75	✓	NA	NA	✓	✓		
Naphthalene					✓	NA	✓	176*	NA	NA	✓	✓		

Surrogate Recovery Outliers *(method/lab limits)*

Sample ID	DBFM	1,4-DCB	Tol-d8	4-BFB	Sample ID	DBFM	1,4-DCB	Tol-d8	4-BFB
None									

IS Outliers *(-50% to +100% of CCV)*

Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT
NA												

Comments: HTs OK for unpreserved samples; pH unknown
9061358: MB, LCS, -01, unknown Dup, unknown MS
9061478: MB, LCS, -02, A9F0860-02 Dup, A9F0860-02 MS
*Parent sample conc >4X spike amount
Sample -02 diluted 10X for all target analytes

Hahn Level III GCMS Worksheet

SDG: A9F0860	Method: 8270D	Matrix: Water	Lab Sample IDs: A9F0860-02
Seq/Batch #s: --/9070583			

Tuning: ☐ Pass ☐ Fail TICs Required? ☐ Yes ☒ No *(lab limits)* *(lab limits)*

Analyte (outliers)	Calibration				Method Blank	5X (10X) Method Blank	LCS %R	LCSD %R	LCS/D RPD	MS %R	MSD %R	MS/D RPD	Lab Dup RPD		
	RF ≥0.05	RSD/r^2 ≤30%	ICV %D ±25%	CCV %D ±25%											
4,6-Dinitro-2-methylphenol					✓	NA	140	✓	✓	NA	NA	NA	NA		

Surrogate Recovery Outliers *(lab limits)*

Sample ID	Nitrobenzene-d5	2-Fluorobiphenyl	Phenol-d6	p-Terphenyl-d14	2-Fluorophenol	2,4,6-Tribromophenol
MB	✓	✓	2	✓	✓	✓
LCS	✓	✓	8	✓	✓	✓
LCSD	✓	✓	7	✓	✓	✓

IS Outliers *(-50% to +100% of CCV)*

Sample ID	Acen-d10	RT	Chry-d12	RT	Per-d12	RT	Dibenz-d14	RT	Area	RT	Area	RT
NA												

Comments: HTs OK. DO = Diluted out
MB, LCS/LCSD, -02,
Sample -02 diluted 10X for all target compounds

Hahn Level III NWTPH-GX Worksheet

SDG: A9F0860	Matrix: Water	Lab Sample IDs: A9F0860-02
Seq./Batch #s: --/9061478		

Tuning: ☒ Pass ☐ Fail

Analyte (outliers)	Calibration			Method Blank	5X Blank	LCS %R	MS %R	MSD %R	MS/D RPD	Lab Dup1 RPD	
	r^2 ≥0.990	ICV/CCV %D ±20%	RT Windows ±20%				*(lab limits)*		*(lab limits)*		
None							NA	NA	NA		

Surrogate Outliers *(50-150%)*

Sample ID	Surrogate	%R	Sample ID	Surrogate	%R	Sample ID	Surrogate	%R
None								

IS Outliers *(-50% to +100% of CCV)*

Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT
NA											

Comments: HT OK for unpreserved samples; pH unknown
MB, LCS, -02, A9F0860-02 Dup

Sample -02 diluted 10X

Hahn Level III NWTPH-DX Worksheet

SDG: A9F0860	Matrix: Water	Lab Sample IDs: A9F0860-02
Seq./Batch #s: --/9070617		

Analyte (outliers)	Calibration			Method Blank	5X Blank	LCS/ LCSD %R *(lab limits)*	MS %R *(lab limits)*	MSD %R	MS/D RPD	LCSD %R	LAB RPD
	r^2 ≥0.990	ICV/CCV %D ±15%	RT Windows								
None							NA	NA	NA		NA

Surrogate Outliers *(50-150%)*

Sample ID	Surrogate	%R	Sample ID	Surrogate	%R	Sample ID	Surrogate	%R
None								

Comments: HTs OK. DO = Diluted out
MB, LCS/LCSD, -02
No dilutions
Sample -02: F17 No fuel pattern was detected. The diesel result represents carbon range C12 to C24, and the oil result represents >C24 to C40.

Hahn Level III Metals Worksheet

SDG: A9F0860	Matrix: Water	Lab Sample IDs: A9F0860-02
Method: 6020A	Seq/Batch #: --/9060523	

ICPMS Mass Cal: ☐ Pass ☐ Fail ☒ NA ICPMS %RSD: ☐ Pass ☐ Fail ☒ NA *(80-120%)* *(75-125%)*

Analyte (outliers)	*(90-110%)* **Calibration**							**ICS A** *<IDL*[1]	**ICS AB %R**[1] ±40%	**MB** ug/L	**10X MB** ug/L	**LCS %R**	**Dup RPD** *≤20%*	**MS %R**	**MSD %R**	**MS/ MSD RPD** *≤20%*	**PS %R**	**Ser. Dil. %D** *≤10%*
	r	**ICV**	**CCV**[1]	**CRI**	**ICB**	**CCB** ug/L	**5X CCB**											
Al (MS2)										✓	NA	✓	✓	135*	NA	NA	NA	NA
Fe										✓	NA	✓	✓		NA	NA	NA	NA

IS Outliers *(Samples 60-125%; CCV/CCB 80-120%)*						**IS Outliers** *(Samples 60-125%; CCV/CCB 80-120%)*					
Sample ID	**Li6 %R**	**Sc45 %R**	**Ge74 %R**	**Rh103 %R**	**Tb159 %R**	**CCV/CCB ID**	**Li6 %R**	**Sc45 %R**	**Ge74 %R**	**Rh103 %R**	**Tb159 %R**
NA						NA					

Comments: HTs OK.
MB, LCS, -02, unknown Dup, unknown MS1, unknown MS2
*Parent sample conc >4X spike amount
#Parent sample <RL and dup >RL; abs diff <RL; OK
No dilutions

[1]CRI limits 70-130% (50-150% for Sb, Pb, Tl)

Hahn Level III Cyanide Worksheet

SDGs: A9F0860	Matrix: Water	Lab Sample IDs: A9F0860-02
Method/Seq/Batch #s: EPA 335.4 (Total CN)/--/9070559; OIA/D6888-09 (Available CN)/--/9070536; ASTM D4282-02 (Free CN)/--/9061475		

										(80-120%)	*(≤20%)*	*(75-125%)*		*(≤20%)*		
Analyte (outliers)	*(85-115%)* **Calibration**							**MB**	**5X MB**	**LCS/ D %R**	**LCSD RPD**	**MS %R**	**MSD %R**	**MS/ MSD RPD**	**Dup RPD**	
	r ≥0.995	**ICV**	**CCV**	**Dist. ICV**	**ICB (ug/L)**	**CCB (ug/L)**	**5X CB (mg/L)**									
None											NA					

Comments: HTs OK.
Tot CN: MB, LCS, -02, unknown Dup, , unknown MS
Avail CN: MB, LCS, -02, A9F0860-02 MS/MSD
Free CN: MB, LCS/LCSD, -02, A9F0860-02 Dup, A9F0860-02 MS
*Parent sample conc >4X spike amount
No dilutions