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Date: September 19, 2016

To: Rob Ede
Hahn and Associates Inc.

From: Jeanne Peterson
Sr. Data Validator, AQA

Subject: Data Validation
Siltronic RI - Doane Creek
Apex Laboratories, LLC SDG A6C1076

SUMMARY

Level III data validation was performed on the data for 22 sediment samples prepared and analyzed with approved procedures using methods SW846 8260B (volatile organic compounds [VOCs]), SW846 8270D (semivolatile organic compounds [SVOCs] and polynuclear aromatic hydrocarbon [PAH] homologues), NWTPH-Gx (gasoline range organics [GRO]), NWTPH-Dx (diesel range organics [DRO]), SW846 6020 (total metals by ICPMS), SW846 9013M/9014 (total cyanide), SW846 9056A (sulfate by IC), SM 5310B Mod (total organic carbon [TOC]), and/or SM4500-NH3 (ammonia as N). 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).

In general, most of the data are valid as reported. No sample 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	Laboratory ID	Matrix	Analysis
5237-160328-DC-SED063G	A6C1076-01	Sediment	VOCs, GRO
5237-160328-DC-SED063	A6C1076-02	Sediment	SVOCs, PAHs, DRO, Metals, Total CN, Sulfate, TOC, and Ammonia
5237-160328-DC-SED065G	A6C1076-03	Sediment	VOCs, GRO
5237-160328-DC-SED065	A6C1076-04	Sediment	SVOCs, PAHs, DRO, Metals, Total CN, Sulfate, TOC, and Ammonia
5237-160328-DC-SED068G	A6C1076-05	Sediment	VOCs, GRO
5237-160328-DC-SED068	A6C1076-06	Sediment	SVOCs, PAHs, DRO, Metals, Total CN, Sulfate, TOC, and Ammonia
5237-160328-DC-SED070G	A6C1076-07	Sediment	VOCs, GRO
5237-160328-DC-SED070	A6C1076-08	Sediment	SVOCs, PAHs, DRO, Metals, Total CN, Sulfate, TOC, and Ammonia
5237-160328-DC-SED072G	A6C1076-09	Sediment	VOCs, GRO
5237-160328-DC-SED072	A6C1076-10	Sediment	SVOCs, PAHs, DRO, Metals, Total CN, Sulfate, TOC, and Ammonia
5237-160328-DC-SED075G	A6C1076-11	Sediment	VOCs, GRO
5237-160328-DC-SED075	A6C1076-12	Sediment	SVOCs, PAHs, DRO, Metals, Total CN, Sulfate, TOC, and Ammonia
5237-160328-DC-SED077G	A6C1076-13	Sediment	VOCs, GRO
5237-160328-DC-SED077	A6C1076-14	Sediment	SVOCs, PAHs, DRO, Metals, Total CN, Sulfate, TOC, and Ammonia
5237-160328-DC-SED077GD	A6C1076-15	Sediment	VOCs, GRO
5237-160328-DC-SED077G	A6C1076-16	Sediment	SVOCs, PAHs, DRO, Metals, Total CN, Sulfate, TOC, and Ammonia
5237-160328-DC-SED082G	A6C1076-17	Sediment	VOCs, GRO

Sample ID	Laboratory ID	Matrix	Analysis
5237-160328-DC-SED082	A6C1076-18	Sediment	SVOCs, PAHs, DRO, Metals, Total CN, Sulfate, TOC, and Ammonia
5237-160328-DC-SED085G	A6C1076-19	Sediment	VOCs, GRO
5237-160328-DC-SED085	A6C1076-20	Sediment	SVOCs, PAHs, DRO, Metals, Total CN, Sulfate, TOC, and Ammonia
5237-160328-DC-SED087G	A6C1076-21	Sediment	VOCs, GRO
5237-160328-DC-SED087	A6C1076-22	Sediment	SVOCs, PAHs, DRO, Metals, Total CN, Sulfate, TOC, and Ammonia

DATA QUALIFIERS (see following sections for detailed explanations)

Sample ID	Method	Analyte	Qualifier	Reason for Qualification
5237-160328-DC-SED063	8270D	Fluoranthene Pyrene	J	High matrix spike recovery and poor replicate precision
		Acenaphthene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(g,h,i)perylene Chrysene Dibenz(a,h)anthracene Fluorene Indeno(1,2,3-cd)pyrene Phenanthrene Carbazole	J	Poor replicate precision

Sample ID	Method	Analyte	Qualifier	Reason for Qualification
	8270D Scan	C1-Chrysenes/ Benz(a)anthracenes C1-Fluoranthenes/Pyrenes C1-Phenanthrenes/ Anthracenes C2-Chrysenes/ Benz(a)anthracenes C2-Phenanthrenes/ Anthracenes C3-Chrysenes/ Benz(a)anthracenes	J	Insufficient calibration
	NwTPH-Dx	Diesel Oil	J	Poor replicate precision
	6020	Aluminum Zinc	J	High matrix spike recovery
		Vanadium	J	High matrix spike recovery and poor replicate precision
		Iron Manganese	J	Poor replicate precision
5237-160328-DC-SED065	8270D	Benzoic acid	UJ	High calibration verification negative bias
		Acenaphthene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(g,h,i)perylene Chrysene Dibenz(a,h)anthracene Fluoranthene Fluorene Indeno(1,2,3-cd)pyrene Phenanthrene Pyrene Carbazole	J	Poor replicate precision

Sample ID	Method	Analyte	Qualifier	Reason for Qualification
	8270D Scan	C1-Chrysenes/ Benz(a)anthracenes C1-Fluoranthenes/Pyrenes C1-Phenanthrenes/ Anthracenes C2-Chrysenes/ Benz(a)anthracenes C2-Phenanthrenes/ Anthracenes C3-Chrysenes/ Benz(a)anthracenes	J	Insufficient calibration
	6020	Aluminum Zinc	J	High matrix spike recovery
		Vanadium	J	High matrix spike recovery and poor replicate precision
		Iron Manganese	J	Poor replicate precision
5237-160328-DC-SED068	8270D	Benzoic acid	UJ	High calibration verification negative bias
		Acenaphthene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(g,h,i)perylene Chrysene Dibenz(a,h)anthracene Fluoranthene Fluorene Indeno(1,2,3-cd)pyrene Phenanthrene Pyrene Carbazole	J	Poor replicate precision
	8270D Scan	C1-Chrysenes/ Benz(a)anthracenes C1-Fluoranthenes/Pyrenes C1-Phenanthrenes/ Anthracenes	J	Insufficient calibration
	6020	Aluminum Zinc	J	High matrix spike recovery

Sample ID	Method	Analyte	Qualifier	Reason for Qualification
		Vanadium	J	High matrix spike recovery and poor replicate precision
		Iron Manganese	J	Poor replicate precision
5237-160328-DC-SED070	8270D	Benzoic acid	UJ	High calibration verification negative bias
		Acenaphthene Fluorene Carbazole	UJ	Poor replicate precision
		Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(g,h,i)perylene Chrysene Dibenz(a,h)anthracene Fluoranthene Indeno(1,2,3-cd)pyrene Phenanthrene Pyrene	J	Poor replicate precision
	6020	Aluminum Zinc	J	High matrix spike recovery
		Vanadium	J	High matrix spike recovery and poor replicate precision
		Iron Manganese	J	Poor replicate precision
5237-160328-DC-SED072	8270D	Benzoic acid	UJ	High calibration verification negative bias
		Acenaphthene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(g,h,i)perylene Chrysene Dibenz(a,h)anthracene Fluoranthene Fluorene Indeno(1,2,3-cd)pyrene	J	Poor replicate precision

Sample ID	Method	Analyte	Qualifier	Reason for Qualification
		Phenanthrene Pyrene Carbazole		
	8270D Scan	C1-Chrysenes/ Benz(a)anthracenes C1-Fluoranthenes/Pyrenes C1-Phenanthrenes/ Anthracenes C3-Chrysenes/ Benz(a)anthracenes	J	Insufficient calibration
	6020	Aluminum Zinc	J	High matrix spike recovery
		Vanadium	J	High matrix spike recovery and poor replicate precision
		Iron Manganese	J	Poor replicate precision
5237-160328-DC-SED075G	8260B	Acetone	UJ	High calibration verification negative bias
5237-160328-DC-SED075	8270D	Benzoic acid	UJ	High calibration verification negative bias
		Acenaphthene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(g,h,i)perylene Chrysene Dibenz(a,h)anthracene Fluoranthene Fluorene Indeno(1,2,3-cd)pyrene Phenanthrene Pyrene Carbazole	J	Poor replicate precision

Sample ID	Method	Analyte	Qualifier	Reason for Qualification
	8270D Scan	C1-Chrysenes/ Benz(a)anthracenes C1-Fluoranthenes/Pyrenes C1-Fluorenes C1-Phenanthrenes/ Anthracenes C2-Chrysenes/ Benz(a)anthracenes C2-Phenanthrenes/ Anthracenes C3-Chrysenes/ Benz(a)anthracenes C3-Phenanthrenes/ Anthracenes C4-Chrysenes/ Benz(a)anthracenes	J	Insufficient calibration
	6020	Aluminum Zinc	J	High matrix spike recovery
		Vanadium	J	High matrix spike recovery and poor replicate precision
		Iron Manganese	J	Poor replicate precision
5237-160328-DC-SED077	8270D	Naphthalene	U	Blank contamination
		Acenaphthene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(g,h,i)perylene Chrysene Dibenz(a,h)anthracene Fluoranthene Fluorene Indeno(1,2,3-cd)pyrene Phenanthrene Pyrene Carbazole	J	Poor replicate precision

Sample ID	Method	Analyte	Qualifier	Reason for Qualification
	8270D Scan	C1-Chrysenes/ Benz(a)anthracenes C1-Fluoranthenes/Pyrenes C1-Phenanthrenes/ Anthracenes C2-Chrysenes/ Benz(a)anthracenes C2-Phenanthrenes/ Anthracenes	J	Insufficient calibration
	6020	Aluminum Zinc	J	High matrix spike recovery
		Vanadium	J	High matrix spike recovery and poor replicate precision
		Iron Manganese	J	Poor replicate precision
	SM 5310B Mod	TOC	J	High initial calibration negative bias
5237-160328-DC-SED077D	8270D	Acenaphthene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(g,h,i)perylene Chrysene Dibenz(a,h)anthracene Fluoranthene Fluorene Indeno(1,2,3-cd)pyrene Phenanthrene Pyrene Carbazole	J	Poor replicate precision
	8270D Scan	C1-Chrysenes/ Benz(a)anthracenes C1-Fluoranthenes/Pyrenes C1-Phenanthrenes/ Anthracenes	J	Insufficient calibration
	6020	Aluminum Zinc	J	High matrix spike recovery

Sample ID	Method	Analyte	Qualifier	Reason for Qualification
		Vanadium	J	High matrix spike recovery and poor replicate precision
		Iron Manganese	J	Poor replicate precision
	SM 5310B Mod	TOC	J	High initial calibration negative bias
5237-160328-DC-SED082	8270D	Benzoic acid	UJ	High calibration verification negative bias
		Acenaphthene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(g,h,i)perylene Chrysene Dibenz(a,h)anthracene Fluoranthene Fluorene Indeno(1,2,3-cd)pyrene Phenanthrene Pyrene Carbazole	J	Poor replicate precision
	8270D Scan	C1-Chrysenes/ Benz(a)anthracenes C1-Fluoranthenes/Pyrenes	J	Insufficient calibration
	6020	Aluminum Zinc	J	High matrix spike recovery
		Vanadium	J	High matrix spike recovery and poor replicate precision
		Iron Manganese	J	Poor replicate precision

Sample ID	Method	Analyte	Qualifier	Reason for Qualification
5237-160328-DC-SED085	8270D	Acenaphthene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(g,h,i)perylene Chrysene Dibenz(a,h)anthracene Fluoranthene Fluorene Indeno(1,2,3-cd)pyrene Phenanthrene Pyrene Carbazole	J	Poor replicate precision
	8270D Scan	C1-Chrysenes/ Benz(a)anthracenes C1-Fluoranthenes/Pyrenes C1-Phenanthrenes/ Anthracenes C2-Phenanthrenes/ Anthracenes C3-Naphthalenes C3-Phenanthrenes/ Anthracenes	J	Insufficient calibration
	6020	Aluminum Zinc	J	High matrix spike recovery
		Vanadium	J	High matrix spike recovery and poor replicate precision
		Iron Manganese	J	Poor replicate precision
	SM 5310B Mod	TOC	J	High initial calibration negative bias
5237-160328-DC-SED087G	8260B	Acetone	UJ	High calibration verification negative bias

Sample ID	Method	Analyte	Qualifier	Reason for Qualification
5237-160328-DC-SED087	8270D	Benzoic acid	UJ	High calibration verification negative bias
		Acenaphthene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(g,h,i)perylene Chrysene Dibenz(a,h)anthracene Fluoranthene Fluorene Indeno(1,2,3-cd)pyrene Phenanthrene Pyrene Carbazole	J	Poor replicate precision
	8270D Scan	All target analytes *except*: C3-Chrysenes/ Benz(a)anthracenes C4-Chrysenes/ Benz(a)anthracenes C4-Phenanthrenes/ Anthracenes	J	Lack of calibration data
	6020	Vanadium Iron Manganese	J	Poor replicate precision

DISCUSSION

Sample Shipping/Receiving

All COC, analysis request, and sample receipt documentation was complete and correct.

Holding Times and Preservation

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

Instrument Tune

All instrument tune requirements were met.

Calibration

All initial and continuing calibration acceptance criteria were met with the following exceptions.

Method 8260B

The initial calibration (ICAL) relative response factors (RRFs) were <0.05 but ≥0.01 for chloroethane and trichlorofluoromethane. Quadratic equations were used to calculate the sample results; therefore no sample data were qualified based on professional judgment.

The initial and continuing calibration verification (ICV/CCV) percent difference (%D) was >25% with negative bias for acetone. The associated sample results were non-detects and, therefore, were **qualified UJ**.

The ICV and/or CCV %Ds were >25% with positive bias for chloroethane, trichlorofluoromethane, bromomethane, and vinyl chloride. The associated sample results were non-detects and not affected by the high bias, therefore, were not qualified based on professional judgment.

Method 8270D

The ICAL and/or ICV/CCV RRFs were <0.05 but ≥0.01 for pentachlorophenol and 2,4,6-tribromophenol. Quadratic equations were used to calculate the sample results; therefore no sample data were qualified based on professional judgment.

The CCV %D associated with sequence 6D01020 was >25% with negative bias for benzoic acid. The associated sample results were non-detects and, therefore, were **qualified UJ**.

The CCV percent recoveries (%Rs) associated with sequence 6D08012 was >25% with positive bias for 3,3'-dichlorobenzidine. The associated sample results were non-detects and not affected by the high bias, therefore, were not qualified based on professional judgment.

Method 8270D Scan

The SVOC analyses were scanned for the quantitative ions corresponding to 15 PAH homologue groups. Full calibration of the target groups was not performed; therefore, all sample results that were detects were **qualified J** based on professional judgment.

Method 6020

CCV recoveries were > the upper acceptance limit for selenium. The associated sample results were either non-detects or QC samples and, therefore, no sample data were qualified based on professional judgment.

Method SM 5310B Mod

The recalculated TOC ICAL standard was not within ±10% of the true value for ICAL level 1. The TOC results for samples 5237-160328-DC-SED077, 5237-160328-DC-SED077D, and 5237-160328-DC-SED085 were detects whose nominals were < the concentration of the ICAL Level 2 standard and, therefore, were **qualified J**. The remaining associated sample results were detects greater than the concentration of ICAL level 2 and not affected by the high bias demonstrated by the lower standard and, therefore, were not qualified based on professional judgment.

Method SM4500-NH3 Mod

The recalculated ammonia as N ICAL standard was not within ±10% of the true value for ICAL level 1. The associated sample results were detects greater than the concentration of ICAL level 2 and not affected by the high bias demonstrated by the lower standard and, therefore, were not qualified based on professional judgment.

Reporting Limit Verification

All CRI recoveries met QC acceptance criteria.

ICP Interference Check Samples (ICS A and ICS AB)

The ICS A and ICS AB analyses were not applicable to all samples because concentrations of the interferents (aluminum, calcium, iron and magnesium) in the samples at their lowest dilutions were < those in the ICS solutions. The ICS recoveries met all QC acceptance criteria.

Blanks

Methods 8260B, 8270D Scan, NWTPH-Gx, NWTPH-Dx, 6020, 9013M/9014, 9056A, SM 5310B Mod, and SM4500-NHS Mod

No target analytes were detected in the calibration blanks and/or method blanks.

Method 8270D

Naphthalene was detected in the method blank. The naphthalene result for sample 5237-160328-DC-SED077 was a detect > the RL but <5X the method blank value and, therefore, was **qualified U** at the reported value. The remaining associated sample results were either detects >5X the method blank value or non-detects and, therefore, were not qualified based on professional judgment.

Surrogates

All surrogate recoveries laboratory met QC acceptance criteria with the following exception.

Method 8260B

The dibromofluoromethane recovery was > the upper acceptance limit for sample 5237-160328-DC-SED087G. The associated sample results were non-detects and not affected by the high bias, therefore, were not qualified based on professional judgment.

Laboratory Control Sample

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

Method 8260B

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

Method 8270D

The LCS recovery was > the laboratory upper acceptance limit for 3,3'-dichlorobenzidine. The associated sample results were non-detects and not affected by the high bias, therefore, were not qualified based on professional judgment.

Matrix Spike (MS)

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

Method 8270D

The MS recovery was > the laboratory upper acceptance limit for 3,3'-dichlorobenzidine. The associated sample results were non-detects and not affected by the high bias and, therefore, were not qualified based on professional judgment.

The MS recoveries were > the laboratory upper acceptance limits for fluoranthene and pyrene. The fluoranthene and pyrene results for parent sample 5237-160328-DC-SED063 were detects and, therefore, were **qualified J**. Because the LCS and all instrument QC criteria were met, and the surrogate recoveries for the duplicate sample were similar to those of the parent sample, the fluoranthene and pyrene results for the remaining associated samples were not qualified based on professional judgment.

Method 8270D Scan

The MS recoveries were > the laboratory upper acceptance limits for all spiked analytes. The spiked analytes were individual compounds instead of compound ranges, and the analytes that were detects were already qualified for insufficient calibration; therefore, the sample results were not further qualified based on professional judgment.

Method 6020

The MS recoveries associated with parent sample 5237-160328-DC-SED063 were > the laboratory upper acceptance limits for vanadium, aluminum, and zinc. The vanadium, aluminum, and zinc results for all samples *except* 5237-160328-DC-SED087 were detects and, therefore, were **qualified J**. The vanadium, aluminum, and zinc results for sample 5237-160328-DC-SED087 were not qualified because another MS was performed on that sample and met all QC acceptance criteria.

MS recoveries were outside of acceptance limits for iron, manganese, and barium. The parent sample concentrations were >4X the spike amounts and, therefore, no sample data were qualified.

Methods 8260B, NWTPH-Gx, NWTPH-Dx, and SM 5310B Mod

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

Laboratory Duplicate

The laboratory duplicate analyses met all QC acceptance criteria with the following exceptions.

Method 8270D

The laboratory duplicate RPDs were > the laboratory acceptance limit for 15 target analytes (see DV worksheet for analyte list). The associated sample results that were detects were **qualified J**, and the associated sample results that were non-detects were **qualified UJ**.

Method 8270D Scan

The laboratory duplicate RPDs or absolute values were > the laboratory acceptance limits for C1-chrysenes/benz(a)anthracenes, C1-fluoranthenes/pyrenes, C1-phenanthrenes/anthracenes, C2-chrysenes/benz(a)anthracenes, C2-phenanthrenes/anthracenes, and C3-phenanthrenes/ anthracenes. Precision was not expected due to the method used to quantitate the results, and the analytes that were detects were already qualified for insufficient calibration; therefore, the sample results were not further qualified based on professional judgment.

Method NWTPH-Dx

The laboratory duplicate RPDs associated with parent sample 5237-160328-DC-SED063 were > the laboratory acceptance limit for diesel and oil. The diesel and oil results for parent sample 5237-160328-DC-SED063 were detects and, therefore, were **qualified J**. Because the laboratory duplicate results associated with sample 5237-160328-DC-SED087 were within QC limits, no other sample data were qualified based on professional judgment

Method 6020

The laboratory duplicate RPDs were> the laboratory acceptance limit for iron, vanadium, and manganese. All associated sample results were detects and, therefore, were **qualified J**.

Internal Standards

All required internal standards met QC acceptance criteria with the following exceptions.

Method 6020

Internal standard recoveries were <80% but ≥60% for several CCVs and CCBs. All acceptance criteria were met and, therefore, no sample data were qualified based on professional judgment.

ICPMS Serial Dilution

A serial dilution analysis was not performed with the samples in this work order.

Reporting Limits (RLs)

All reporting limits (RLs) were properly reported.

Methods 8260B and NWTPH-Gx

The samples were analyzed as mid-level soils with a 50X dilution factor. RLs were adjusted accordingly and may not have met the project-specified RLs and/or project quantitation limit goals.

Methods 8270D and 8270D Scan

Samples 5237-160328-DC-SED063, 5237-160328-DC-SED065, 5237-160328-DC-SED068, 5237-160328-DC-SED070, 5237-160328-DC-SED072, 5237-160328-DC-SED082, 5237-160328-DC-SED085, and 5237-160328-DC-SED087 were diluted 4X, and sample 5237-160328-DC-SED075 was diluted 10X. RLs were adjusted accordingly and may not have met the project RLs and/or project quantitation limit goals.

Method NWTPH-Dx

Samples 5237-160328-DC-SED0875was diluted 2X. RLs were adjusted accordingly and may not have met the project RLs and/or project quantitation limit goals.

Method 6020A

The samples were analyzed at 5X and/or 50X dilutions. RLs were adjusted accordingly and may not have met the project-specified RLs and/or project quantitation limit goals.

Other QC

QC summary forms were either incomplete or not submitted in the data package for some analyses. In these cases, the results were either found in the raw data or were calculated for validation purposes (refer to the Comments sections of the data validation spreadsheets).

No other specific issues that affect data quality were identified.

Hahn Data Validation Summary Worksheet

SDG#: A6C1076	Laboratory: Apex	Validator: Jeanne Peterson	Validation Date: 06/14/2016
Site: Siltronic - Doane Creek	COC#: NA		Validation Level: ☐ II ☒ III
Matrix: Sediment	# of Samples: 22	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:

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 <3X HT	Analysis ≥3X HT
None								

Comments: Samples collected 3/28.

Cooler temps OK.

Hahn Level III GCMS Worksheet

SDG: A6C1076	Method: 8260B	Matrix: Sediment	Lab Sample IDs: A6C1076-01, -03, -05, -07, -09, -11, -13, -15, -17, -19, -21
Batch #s: 6030957			

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/D RPD**	**Lab Dup RPD**			
	RF ≥0.05	**RSD/r²** ≤30% ≥0.990	**ICV %D** ±25%	**CCV %D** ±25%										
Chloroethane	0.0201*	✓	268	60	✓	NA	172	NA	NA	NA	✓			
Trichlorofluoromethane	0.0299*	✓	193	53	✓	NA	338	NA	NA	NA	✓			
Acetone	✓	✓	-27.6	✓	✓	NA	✓	NA	NA	NA	✓			
Bromomethane	✓	✓	✓	28.8	✓	NA	✓	NA	NA	NA	✓			
Vinyl chloride	✓	✓	✓	25.2	✓	NA	✓	NA	NA	NA	✓			

Surrogate Recovery Outliers *(method/lab limits)*

Sample ID	DBFM	1,4-DFB	Tol-d8	4-BFB	**Sample ID**	DBFM	1,4-DCB	Tol-d8	4-BFB
-21	131	✓	✓	✓					

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

Sample ID	**Area**	**RT**	**Area**	**RT**	**Area**	**RT**	**Area**	**RT**	**Area**	**RT**	**Area**	**RT**
None												

Comments: HTs OK. ICAL A6C0904; CCV 6C30010-CCV1.
MB, LCS, -01 Dup; All samples diluted 50X
Sample results ND for outliers.
*Alternate curve analyzed

Hahn Level III GCMS Worksheet

SDG: A6C1076	Method: 8270D	Matrix: Sediment	Lab Sample IDs: A6C1076-02, -04, -06, -08, -10, -12, -14, -16, -18, -20, -22
Batch #s: 6040004			

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/D RPD	Lab Dup RPD				
	RF ≥0.05	RSD/r^2 ≤30%	SSV %D ±25%	CCV %D ±25%											
ICAL A6C0702															
PCP (Level 2 only)	0.0417*	✓	✓												
2,4,6-TBP (surr) (L 3&4)	0.0313*	✓	✓												
Sequence 6D01020															
Benzoic acid	✓	✓	✓	-26.1											
ICAL A6C3104															
PCP (Level 3 and 4 only)	0.0315*	✓	✓												
2,4,6-TBP (surr) (L 3&4)	0.0367*	✓	✓												
Sequence 6D04009															
None															
Sequence 6D08012	✓	✓	✓												
3,3'-Dichlorobenzidine	✓	✓	✓	33.9											
Batch 6040004															
Naphthalene	✓	✓	✓	✓	3.56	17.8	✓	✓	NA	NA	**				
3,3'-Dichlorobenzidine	✓	✓	✓	✓	✓	NA	140	125	NA	NA	**				
Fluoranthene	✓	✓	✓	✓	✓	NA	✓	179	NA	NA	**				
Pyrene	✓	✓	✓	✓	✓	NA	✓	185	NA	NA	**				

Surrogate Recovery Outliers *(lab limits)*

Sample ID	2-Fluorophenol	Phenol-d5	2,4,6-TBP	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
None						

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

Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT
None												

Comments: HTs OK. - Same ICAL and ICV/CCV as 8270D Scan; ICAL and SSV raw data included with 8270D Scan section.
ICAL A6C0702; CCV:6D01020 - MB, LCS, -04, -06, -08, -10, -12, -18, -22, -22MS
ICAL A6C3104; CCV: 6D04009 - -02, -02DUP, -20; 6D08012 - -14, -16
*Alternate curve analyzed; OK
**See attached for Dup outliers.
Samples -02, -04, -06, -08, -10, -18, -18, and -22 diluted 4X; sample -12 diluted 10X

DUPLICATES

EPA 8270D

5237-160328-DC-SED063

Laboratory: Apex Laboratories
Client: Hahn and Associates
Matrix: Sediment
Batch: 6040004
Preparation: EPA 3546
Source Sample Name: 5237-160328-DC-SED063

SDG: A6C1076
Project: Siltronic RI-Doane Creek
Laboratory ID: 6040004-DUP1
Lab Source ID: A6C1076-02
Initial/Final: 15.92 g / 2 mL
% Solids: 80.06

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (ug/kg dry)	C	DUPLICATE CONCENTRATION (ug/kg dry)	C	RPD %	Q	METHOD
Acenaphthene	30	25.1		47.9		62	*	EPA 8270D
Acenaphthylene	30	7.70		6.65		15		EPA 8270D
Anthracene	30	34.3		62.8		59	*	EPA 8270D
Benz(a)anthracene	30	237		491		70	*	EPA 8270D
Benzo(a)pyrene	30	357		655		59	*	EPA 8270D
Benzo(b)fluoranthene	30	418		742		56	*	EPA 8270D
Benzo(k)fluoranthene	30	118		226		62	*	EPA 8270D
Benzo(g,h,i)perylene	30	303		494		48	*	EPA 8270D
Chrysene	30	282		574		68	*	EPA 8270D
Dibenz(a,h)anthracene	30	50.4		99.6		66	*	EPA 8270D
Fluoranthene	30	336		585		54	*	EPA 8270D
Fluorene	30	10.5		19.3		59	*	EPA 8270D
Indeno(1,2,3-cd)pyrene	30	269		429		46	*	EPA 8270D
1-Methylnaphthalene	30	ND		ND				EPA 8270D
2-Methylnaphthalene	30	ND		ND				EPA 8270D
Naphthalene	30	ND		ND				EPA 8270D
Phenanthrene	30	155		286		59	*	EPA 8270D
Pyrene	30	412		687		50	*	EPA 8270D
Carbazole	30	26.3		51.8		65	*	EPA 8270D
Dibenzofuran	30	ND		9.55				EPA 8270D
4-Chloro-3-methylphenol	30	ND		ND				EPA 8270D
2-Chlorophenol	30	ND		ND				EPA 8270D
2,4-Dichlorophenol	30	ND		ND				EPA 8270D
2,4-Dimethylphenol	30	ND		ND				EPA 8270D
2,4-Dinitrophenol	30	ND		ND				EPA 8270D
4,6-Dinitro-2-methylphenol	30	ND		ND				EPA 8270D
2-Methylphenol	30	ND		ND				EPA 8270D
3+4-Methylphenol(s)	30	ND		ND				EPA 8270D
2-Nitrophenol	30	ND		ND				EPA 8270D
4-Nitrophenol	30	ND		ND				EPA 8270D
Pentachlorophenol (PCP)	30	ND		ND				EPA 8270D
Phenol	30	ND		ND				EPA 8270D

DUPLICATES

EPA 8270D

Laboratory: Apex Laboratories
Client: Hahn and Associates
Matrix: Sediment
Batch: 6040004
Preparation: EPA 3546
Source Sample Name: 5237-160328-DC-SED063

SDG: A6C1076
Project: Siltronic RI-Doane Creek
Laboratory ID: 6040004-DUP1
Lab Source ID: A6C1076-02
Initial/Final: 15.92 g / 2 mL
% Solids: 80.06

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (ug/kg dry)	C	DUPLICATE CONCENTRATION (ug/kg dry)	C	RPD %	Q	METHOD
2,3,4,6-Tetrachlorophenol	30	ND		ND				EPA 8270D
2,3,5,6-Tetrachlorophenol	30	ND		ND				EPA 8270D
2,4,5-Trichlorophenol	30	ND		ND				EPA 8270D
2,4,6-Trichlorophenol	30	ND		ND				EPA 8270D
Bis(2-ethylhexyl)phthalate	30	ND		ND				EPA 8270D
Butyl benzyl phthalate	30	ND		ND				EPA 8270D
Diethylphthalate	30	ND		ND				EPA 8270D
Dimethylphthalate	30	ND		ND				EPA 8270D
Di-n-butylphthalate	30	ND		ND				EPA 8270D
Di-n-octyl phthalate	30	ND		ND				EPA 8270D
N-Nitrosodimethylamine	30	ND		ND				EPA 8270D
N-Nitroso-di-n-propylamine	30	ND		ND				EPA 8270D
N-Nitrosodiphenylamine	30	ND		ND				EPA 8270D
Bis(2-Chloroethoxy) methane	30	ND		ND				EPA 8270D
Bis(2-Chloroethyl) ether	30	ND		ND				EPA 8270D
Bis(2-Chloroisopropyl) ether	30	ND		ND				EPA 8270D
Hexachlorobenzene	30	ND		ND				EPA 8270D
Hexachlorobutadiene	30	ND		ND				EPA 8270D
Hexachlorocyclopentadiene	30	ND		ND				EPA 8270D
Hexachloroethane	30	ND		ND				EPA 8270D
2-Chloronaphthalene	30	ND		ND				EPA 8270D
1,2-Dichlorobenzene	30	ND		ND				EPA 8270D
1,3-Dichlorobenzene	30	ND		ND				EPA 8270D
1,4-Dichlorobenzene	30	ND		ND				EPA 8270D
1,2,4-Trichlorobenzene	30	ND		ND				EPA 8270D
4-Bromophenyl phenyl ether	30	ND		ND				EPA 8270D
4-Chlorophenyl phenyl ether	30	ND		ND				EPA 8270D
Aniline	30	ND		ND				EPA 8270D
4-Chloroaniline	30	ND		ND				EPA 8270D
2-Nitroaniline	30	ND		ND				EPA 8270D
3-Nitroaniline	30	ND		ND				EPA 8270D
4-Nitroaniline	30	ND		ND				EPA 8270D

DUPLICATES

5237-160328-DC-SED063

EPA 8270D

Laboratory: Apex Laboratories
Client: Hahn and Associates
Matrix: Sediment
Batch: 6040004
Preparation: EPA 3546
Source Sample Name: 5237-160328-DC-SED063

SDG: A6C1076
Project: Siltronic RI-Doane Creek
Laboratory ID: 6040004-DUP1
Lab Source ID: A6C1076-02
Initial/Final: 15.92 g / 2 mL
% Solids: 80.06

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (ug/kg dry)	C	DUPLICATE CONCENTRATION (ug/kg dry)	C	RPD %	Q	METHOD
Nitrobenzene	30	ND		ND				EPA 8270D
2,4-Dinitrotoluene	30	ND		ND				EPA 8270D
2,6-Dinitrotoluene	30	ND		ND				EPA 8270D
Benzoic acid	30	ND		ND				EPA 8270D
Benzyl alcohol	30	ND		ND				EPA 8270D
Isophorone	30	ND		ND				EPA 8270D
Azobenzene (1,2-DPH)	30	ND		ND				EPA 8270D
Bis(2-Ethylhexyl) adipate	30	ND		ND				EPA 8270D
3,3'-Dichlorobenzidine	30	ND		ND				EPA 8270D
1,2-Dinitrobenzene	30	ND		ND				EPA 8270D
1,3-Dinitrobenzene	30	ND		ND				EPA 8270D
1,4-Dinitrobenzene	30	ND		ND				EPA 8270D
Pyridine	30	ND		ND				EPA 8270D
1,4-Dichlorobenzene-d4 (ISTD)		2000		2000				EPA 8270D

* Values outside of QC limits

Hahn Level III GCMS Worksheet

SDG: A6C1076	Method: 8270D Scan	Matrix: Sediment	Lab Sample IDs: A6C1076-02, -04, -06, -08, -10, -12, -14, -16, -18, -20, -22
Batch #s: 6040004			

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/D RPD**	**Lab Dup RPD**				
	RF ≥0.05	**RSD/r²** ≤30%	**SSV %D** ±25%	**CCV %D** ±25%											
1,6,7-Trimethylnaphthalene	*	*	*	*	✓	NA	✓	**	NA	NA	**				
1-Methylphenanthrene	*	*	*	*	✓	NA	✓	**	NA	NA	**				

Surrogate Recovery Outliers *(lab limits)*

Sample ID	Acenaphthene-d8	Benzo(a)pyrene-d12	**Sample ID**	Acenaphthene-d8	Benzo(a)pyrene-d12	
None						

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

Sample ID	**Area**	**RT**	**Area**	**RT**	**Area**	**RT**	**Area**	**RT**	**Area**	**RT**	**Area**	**RT**
None												

Comments: HTs OK. All detects qualified J due to use of scan mode instead of full calibration.

*Same ICAL and ICV/CCV as 8270D. ICAL and ICV/CCV summaries in 8270D form section do not have extra compounds (2,6-dimethylnaphthalene, 1,6,7-trimethylnaphthalene, and 1-methylphenanthrene). ICAL and ICV/CCV raw data have results for 2,6-DMN, but only CCV raw data has 1,6,7-TMP and 1-MP results.

ICAL A6C0702; CCV:6D01020 - MB, LCS, -04, -06, -08, -10, -12, -18, -22, -22MS

ICAL A6C3104; CCV: 6D04009 - -02, -02DUP, -20; 6D08012 - -14, -16

**See attached for Dup and MS outliers.

Samples -02, -04, -06, -08, -10, -18, -20, and -22 diluted 4X; sample -12 diluted 10X

DUPLICATES

5237-160328-DC-SED063

GC/MS Scan

Laboratory: Apex Laboratories
Client: Hahn and Associates
Matrix: Sediment
Batch: 6040004
Preparation: EPA 3546
Source Sample Name: 5237-160328-DC-SED063

SDG: A6C1076
Project: Siltronic RI-Doane Creek
Laboratory ID: 6040004-DUP1
Lab Source ID: A6C1076-02
Initial/Final: 15.92 g / 2 mL
% Solids: 80.06

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (ug/kg dry)	C	DUPLICATE CONCENTRATION (ug/kg dry)	C	RPD %	Q	METHOD
C1-Chrysenes/Benz(a)anthracenes	30	196		592		100	*	GC/MS Scan
C1-Fluoranthrenes/Pyrenes	30	179		66.3		92	*	GC/MS Scan
C1-Fluorenes	30	ND		ND				GC/MS Scan
C1-Phenanthrenes/Anthracenes	30	111		302		93	*	GC/MS Scan
C2-Chrysenes/Benz(a)anthracenes	30	104		347		108	*	GC/MS Scan
C2-Fluorenes	30	ND		ND				GC/MS Scan
C2-Naphthalenes	30	ND		ND				GC/MS Scan
C2-Phenanthrenes/Anthracenes	30	87.9		278		104	*	GC/MS Scan
C3-Chrysenes/Benz(a)anthracenes	30	65.9		186		95	*	GC/MS Scan
C3-Fluorenes	30	ND		ND				GC/MS Scan
C3-Naphthalenes	30	ND		ND				GC/MS Scan
C3-Phenanthrenes/Anthracenes	30	ND		156 abs diff <RL				GC/MS Scan
C4-Chrysenes/Benz(a)anthracenes	30	ND		ND				GC/MS Scan
C4-Naphthalenes	30	ND		ND				GC/MS Scan
C4-Phenanthrenes/Anthracenes	30	ND		ND				GC/MS Scan
2-Methylnaphthalene	30	ND		ND				GC/MS Scan
2,6-Dimethylnaphthalene	30	ND		ND				GC/MS Scan
1,6,7-Trimethylnaphthalene	30	ND		ND				GC/MS Scan
Fluorene	30	ND		ND				GC/MS Scan
1-Methylphenanthrene	30	ND		ND				GC/MS Scan
Pyrene NTA	30	405		685		51	*	GC/MS Scan
Chrysene NTA	30	287		583		68	*	GC/MS Scan

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

GC/MS Scan

5237-160328-DC-SED087

Laboratory:	Apex Laboratories	SDG:	A6C1076
Client:	Hahn and Associates	Project:	Siltronic RI-Doane Creek
Matrix:	Sediment		
Batch:	6040004	Laboratory ID:	6040004-MS2
Preparation:	EPA 3546	Initial/Final:	15.5 g / 2 mL

Source Sample Name: 5237-160328-DC-SED087

COMPOUND	SPIKE ADDED (ug/kg dry)	SAMPLE CONCENTRATION (ug/kg dry)	MS CONCENTRATION (ug/kg dry)	MS % REC. (*=Out)	QC LIMITS REC.
2-Methylnaphthalene	667	ND	1140	171 *	38 - 122
2,6-Dimethylnaphthalene	667	ND	1010	151 *	40 - 125
1,6,7-Trimethylnaphthalene	667	49.9	1160	166 *	45 - 125
Fluorene	667	543	2630	313 *	43 - 125
1-Methylphenanthrene	667	133	2130	299 *	45 - 125
Pyrene	667	2550 >4X spike amount	23900	3200 *	47 - 127
Chrysene	667	293	9030	1310 *	50 - 124

Hahn Level III NWTPH-GX Worksheet

SDG: A6C1076	Matrix: Sediment	Lab Sample IDs: A6C1076-01, -03, -05, -07, -09, -11, -13, -15, -17, -19, -21
Method/Batch #s: 6030957		

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

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

Comments: HTs OK. MB, LCS, -01dup
Lab used avg RFs; RSD <15%. ICV/CV surrogates checked as %Rs. All OK.

Hahn Level III NWTPH-DX Worksheet

SDG: A6C1076	Matrix: Sediment	Lab Sample IDs: A6C1076-02, -04, -06, -08, -10, -12, -14, -16, -18, -20, -22
Method/Batch #s: 6031009		

Analyte (outliers)	Calibration			Method Blank	5X Blank	LCS %R	MS %R	MSD %R	MS/D RPD	Lab DUP RPD (-02)	Lab DUP RPD (-22)
	r^2 ≥0.990 ±20%	ICV/CCV %D ±15%	RT Windows								
Diesel	✓	✓	NA	✓	NA	✓	NA	NA	NA	48	✓
Oil	✓	✓	NA	✓	NA	NA	NA	NA	NA	50	✓

Surrogate Outliers *(50-150%)*

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

Comments: HTs OK. MB, LCS, -02DUP, -22DUP
Lab use avg RFs; all RSDs <15%. ICV/CV surrogates checked as %Rs. All OK.
Sample -12 diluted 2X

Hahn Level III Metals Worksheet

SDG: A6C1076	Matrix: Sediment	Lab Sample IDs: A6C1076-02, -04, -06, -08, -10, -12, -14, -16, -18, -20, -22
Method: 6020	Batch #s: 6040194	

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

Analyte (outliers)	*(90-110%)* **Calibration**							**ICS A** *<IDL*	**ICS AB %R** ±20%	**MB** ug/L	**10X MB** ug/L	**LCS %R**	**MS %R (-02)**	**MS %R (-22)**	**Lab Dup RPD** *≤20%*	**PS %R**	**Ser. Dil. %D** ≤10%
	r	**ICV**	**CCV**	**CRI**	**ICB**	**CCB** ug/L	**10X CCB**										
Fe	✓	✓	✓	✓	✓	✓	NA	#	#	✓	NA	✓	22*	165*	47	NA	NA
V	✓	✓	✓	✓	✓	✓	NA	#	#	✓	NA	✓	111	✓	44	NA	NA
Mn	✓	✓	✓	✓	✓	✓	NA	#	#	✓	NA	✓	-187*	774*	53	NA	NA
Al	✓	✓	✓	✓	✓	✓	NA	#	#	✓	NA	✓	139	✓	✓	NA	NA
Zn	✓	✓	✓	✓	✓	✓	NA	#	#	✓	NA	✓	128	✓	✓	NA	NA
Ba	✓	✓	✓	✓	✓	✓	NA	#	#	✓	NA	✓	✓	126*	✓	NA	NA
Se[1]	✓	✓	126	✓	✓	✓	NA	#	#	✓	NA	✓	✓	✓	✓	NA	NA
Se[2]	✓	✓	120	✓	✓	✓	NA	#	#	✓	NA	✓	✓	✓	✓	NA	NA

IS Outliers *(Samples 60-125%; CCV/CCB 80-120%)*				**IS Outliers** *(Samples 60-125%; CCV/CCB 80-120%)*			
Sample ID	**%Recovery**	**%Recovery**	**%Recovery**	**CCV/CCB ID**	**%Recovery**	**%Recovery**	**%Recovery**
-02	Sc45 131.4	--	--	**			

Comments: HTs OK. CRI at 90% of CRDL, not at 2X CRDL.

*Parent sample conc >4X spike amount.

**Several CCVs and CCBs had recoveries ,80% but ≥60%; CCVs were within acceptance criteria.

[1]Sample -02RE only; ND

[2]Samples -22RE and -22MS3 only; -22 ND.

#Samples reported from dilutions; nominals <ICS spike amounts.

-02 No associated analytes reported from low IS.

Hahn Level III Cyanide Worksheet

SDG: A6C1076	Matrix: Sediment	Lab Sample IDs: A6C1076-02, -04, -06, -08, -10, -12, -14, -16, -18, -20, -22
Method/Batch #s: 9013M/9014 (total)/6040256		

(80-120%) (75-125%) (≤20%)

Analyte (outliers)	***(85-115%)*** **Calibration**							**MB**	**5X MB**	**LCS %R**	**MS %R**	**MSD %R**	**MS/D RPD**	**DUP RPD**			
	r ≥0.995	**ICV**	**CCV**	**Dist. ICV**	**ICB**	**CCB** (ug/L)	**5X CB**										
None																	

Comments: HTs OK. MB, LCS, -02DUP, -02MS

ICAL results not on ICAL summary; results found in raw data.

Hahn Level III General Chemistry Worksheet

SDG: A6C1076	Matrix: Sediment	Lab Sample IDs: A6C1076-02, -04, -06, -08, -10, -12, -14, -16, -18, -20, -22
Method/Batch #s: 9056 (sulfate)/6040118; SM 5310B Mod (TOC)/6040120 and 6040121 (-22 only); SM4500-NHS Mod (NH3)/6040053		

(80-120%) (75-125%) ≤20%

Analyte (outliers)	*(90-110%)* **Calibration**						**Method Blank**	**5X MB**	**LCS %R**	**MS %R**	**Lab Dup RPD**						
	r ≥0.995	**ICV**	**CCV**	**ICB**	**CCB**	**5X CB**											
None																	

Comments: HTs OK.

SO4: MB, LCS, -04dup, -04MS; all ICAL standards within 10% of true value (see raw data).

TOC: MB, LCS, -04DUP, MB, LCS; No ICAL summary for TOC; results found in raw data. ICV not reported and no sequence provided for ICAL. All ICAL standards within 10% of true value except 20 ugC (see raw data), samples-14, -16, and -20 results <50ugC standard (see raw data), qualified J; all others OK.

NH3: MB, LCS, -02MS, -02 Dup; ICAL summary incomplete; Correlation Coef blacked out in raw data; ICAL calculated and all ICAL standards within 10% of true value except lowest 0.02 ppm - positive bias (see recalcs); all nominals >0.05; OK .

No dilutions