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GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

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November 1, 2017

Municipality of Anchorage
3640 East Tudor Road, Warehouse No. 1
Anchorage, AK 99507

Attn: Mr. Jon Clark

RE: SEPTEMBER 2017 GROUNDWATER MONITORING, FIRE STATION NO. 4, 4350 MACINNES STREET, ANCHORAGE, ALASKA; ADEC FILE NO. 2100.26.315

This letter report documents the results of our September 2017 groundwater monitoring activities at Fire Station No. 4 located at 4350 MacInnes Street in Anchorage, Alaska. A vicinity map is included as Figure 1.

In a letter dated October 26, 2016, Mr. Joshua Barsis of the Alaska Department of Environmental Conservation (ADEC) requested that Monitoring Wells B1MW and B2MW be sampled annually. The objectives of this project were to collect and analyze groundwater samples from two of the four on-site wells, evaluate contaminant trends, and conduct product recovery if light non-aqueous phase liquid (LNAPL) was encountered at sufficient thickness.

Authorization to proceed with this project was received from the Municipality of Anchorage (MOA) on April 5, 2017 in the form of Purchase Order No. 20170413. The project tasks were conducted in general accordance with our April 19, 2017 ADEC-approved work plan.

FIELD ACIVITIES

Project activities consisted of collecting groundwater samples, laboratory analysis of groundwater samples, and managing investigation-derived waste (IDW). Analytical testing of the project samples was conducted by SGS North America Inc. (SGS) of Anchorage, Alaska. Field work was led by an ADEC-qualified Environmental Professional, as defined by 18 Alaska Administrative Code (AAC) 75.990. Field notes are provided in Attachment 1.

Groundwater Elevations and Flow Direction

Prior to initiating groundwater sampling activities, depth to groundwater was measured in the four on-site monitoring wells (Wells B1MW through B4MW) on September 27, 2017 using a

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product/water interface probe. LNAPL was not encountered in the wells. Measurements were taken with respect to the top of the well casings and depths were determined to an accuracy of 0.01 foot. The product/water interface probe was decontaminated prior to insertion in each well. The September 2017 water levels are listed in Table 1. As shown on Figure 2, the groundwater flow direction in September 2017 was towards the northeast.

Groundwater Sampling

On September 27, 2017, Wells B1MW and B2MW were purged and sampled using a submersible pump placed within 2 feet of the groundwater interface, and disposable polyethylene tubing. The pump rate was set at 0.1 to 0.3 liters per minute (L/min) with a goal of limiting the sustained water drawdown to a maximum of 0.1 meter (4 inches). Field personnel monitored drawdown, water quality parameters (pH, temperature, conductivity, and turbidity), and purge volume at 3- to 5-minute intervals. When the four water quality parameters stabilized, purging was stopped and a groundwater sample collected. The stabilization criteria consisted of three successive readings of pH within 0.1 unit, temperature within 3 percent (minimum of 0.2° Celsius), conductivity within 3 percent, and turbidity within 10 percent or three consecutive readings of less than 10 Napthelometric Turbidity Units (NTU). Water quality measurements stabilized in each well prior to sampling.

The analytical samples were collected by transferring water directly from the pump tubing into laboratory-supplied containers. A field duplicate sample (Sample B11MW) was collected from Well B1MW and submitted blind to SGS. The samples were placed into a chilled cooler for transport to SGS. The purge water was contained in one 5-gallon bucket and stored onsite pending disposal.

Laboratory Analysis

The September 2017 groundwater samples were delivered to SGS using chain-of-custody procedures. The three groundwater samples, including one duplicate, were analyzed for gasoline range organics (GRO) by Alaska Method (AK) 101; diesel range organics (DRO) by AK 102; and benzene, ethylbenzene, toluene, and xylenes (BTEX) by Environmental Protection Agency (EPA) Method 8021B. A water trip blank accompanied the sample cooler and was analyzed for GRO by AK 101 and BTEX by EPA Method 8021B.

DISCUSSION OF RESULTS

The analytical groundwater results were compared to the ADEC cleanup levels listed in the July 2017 18 AAC 75 regulations (Table C, 18 AAC 75.345). The cleanup levels and analytical

results for the September 2017 groundwater samples are provided in Table 2, and the laboratory report and completed ADEC Laboratory Data Review Checklist (LDRC) are included in Attachment 2. Historical results are summarized on Table 3.

Project Samples

Duplicate Samples B1MW/B11MW contained a maximum of 86.0 milligrams per liter (mg/L) GRO, 13.8 mg/L DRO, 10.4 mg/L benzene, 23.4 mg/L toluene, 2.65 mg/L ethylbenzene, and 15.9 mg/L xylenes, which exceed the ADEC Table C cleanup levels of 2.2 mg/L, 1.5 mg/L, 0.0046 mg/L, 1.1 mg/L, 0.015 mg/L, and 0.19 mg/L respectively.

The groundwater sample collected from Well B2MW contained an estimated (J-flagged) concentration of benzene (0.000390 mg/L) less than the ADEC cleanup level. The remaining target analytes were not detected.

Quality Assurance Samples

The project laboratories implement on-going quality assurance/quality control procedures to evaluate conformance to ADEC data quality objectives (DQO). Internal laboratory controls to assess data quality for this project include surrogates, method blanks, and laboratory control sample/laboratory control sample duplicates (LCS/LCSD) to determine precision, accuracy, and matrix bias. If a DQO was not met, the project laboratory provides a brief narrative concerning the problem in the case narrative of their laboratory report (See Attachment 2).

One groundwater field duplicate set (Samples B1MW and B11MW) was collected during the September 2017 sampling event to assess precision of the sampling and analysis process using the calculated relative percent difference (RPD). The RPDs are within the ADEC DQO of 30 percent for groundwater.

One laboratory-supplied trip blank accompanied the sample containers during transport to and from the project during the September 2017 sampling event. Toluene and xylenes were detected in the trip blank at an estimated (J-flagged) concentrations of 0.000410 mg/L and 0.000620 mg/L, respectively. DRO was detected in the method blank at an estimated concentration of 0.225 mg/L. Similar estimated concentrations of toluene, xylenes, and DRO were detected in Sample B2MW. As a result, the DRO, toluene, and xylene results for B2MW are reported as non-detect at the limit of quantitation and qualified (B-flagged) in Table 2.

Shannon & Wilson reviewed the SGS deliverables and completed the ADEC's Laboratory Data Review Checklist (LDRC) for the data package which is included in Attachment 2. Quality control discrepancies and the impact to data quality/usability are described in further detail in the

LDRC. No non-conformances that would adversely impact data usability for the objectives of this project were noted.

INVESTIGATION DERIVED WASTE

IDW for this project consisted of one 5-gallon bucket of purge water. With approval from the ADEC, the purge water bucket was collected by NRC on October 12, 2017 and disposed of at their Anchorage facility. Copies of the completed ADEC *Transport, Treatment, & Disposal Approval Form for Contaminated Media* and the non-hazardous waste manifest are included in Attachment 3.

SUMMARY

Project activities at Fire Station No. 4 consisted of collecting analytical groundwater samples from two on-site wells in September 2017, laboratory testing of the groundwater samples, and IDW disposal. GRO, DRO and BTEX were detected in the project samples collected from Well B1MW at concentrations greater than the ADEC Table C cleanup levels. Although LNAPL was not detected in Well B1MW, the concentrations of GRO and DRO detected are indicative of LNAPL, which is typical for this well. The sample collected from Well B2MW contained an estimated (J-flagged) concentration of benzene at a level less than the applicable ADEC cleanup level. Samples collected from Well B2MW have not contained contaminants exceeding ADEC cleanup levels since 2013.

CLOSURE/LIMITATIONS

This report was prepared for the exclusive use of our client and their representatives in the study of this site. The findings we have presented in this report are based on the limited sampling and analyses that we conducted. They should not be construed as a definite conclusion regarding the site's groundwater quality. As a result, the sampling and analyses performed can only provide you with our professional judgment as to the environmental characteristics of this site, and in no way guarantees that an agency or its staff will reach the same conclusions as Shannon & Wilson, Inc. The data presented in this report should be considered representative of the time of our site assessment. Changes in site conditions can occur over time, due to natural forces or human activity. In addition, changes in government codes, regulations, or laws may occur. Because of such changes beyond our control, our observations and interpretations for this site may need to be revised.

You are advised that various state and federal agencies (ADEC, EPA, etc.) may require the reporting of this information. Shannon & Wilson does not assume the responsibility for reporting

these findings and therefore has not, and will not, disclose the results of this study, except with your permission or as required by law.

Copies of documents that may be relied upon by our client are limited to the printed copies (also known as hard copies) that are signed or sealed by Shannon & Wilson with a wet, blue ink signature. Files provided in electronic media format are furnished solely for the convenience of the client. Any conclusion or information derived from electronic files shall be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, or you question the authenticity of the report, please contact the undersigned.

Shannon and Wilson has prepared the information in Attachment 4, "Important Information About Your Geotechnical/Environmental Report," to assist you and others in understanding the use and limitations of our reports.

We appreciate this opportunity to be of service. Please call the undersigned or Dan McMahon at 907-561-2120 with questions or comments concerning the contents of this report.

Sincerely,

SHANNON & WILSON, INC.

Jake Kesler
Environmental Scientist

Matthew Hemry, P.E.
Vice President

Enc: Tables 1 through 3; Figures 1 and 2; and Attachments 1 through 4

TABLE 1
WELL SAMPLING LOG

	Monitoring Well Number			
	B1MW	**B2MW**	**B3MW**	**B4MW**
Water Level Measurement Data				
Date Water Level Measured	9/27/2017	9/27/2017	9/27/2017	9/27/2017
Time Water Level Measured	13:45	13:40	13:30	13:15
Surveyed Measuring Point Elevation (feet)	100.47	99.16	99.65	100.42
Measured Depth to Water (feet below TOC)	10.55	9.38	10.00	10.60
Water Level Elevation (feet)	89.92	89.78	89.65	89.82
Purging/Sampling Data				
Date Sampled	9/27/2017	9/27/2017	NS	NS
Time Sampled	16:02	14:41	NS	NS
Measured Depth to Water (feet below TOC)	10.55	9.38	10.00	10.60
Total Depth of Well Below (feet below TOC)	14.47	15.20	15.28	14.89
Water Column in Well (feet)	3.92	5.82	5.28	4.29
Gallons per Foot	0.16	0.16	0.16	0.16
Water Column Volume (gallons)	0.63	0.93	0.84	0.69
Total Volume Pumped (gallons)	1.8	1.8	-	-
Purging Method	SP	SP	-	-
Sampling Method	SP	SP	-	-
Diameter of Well Casing	2-inch	2-inch	2-inch	2-inch
Water Quality Data				
Temperature, ^{o}C	13.6	13.1	-	-
Specific Conductance, µS/cm	795	445	-	-
pH, standard units	6.55	6.40	-	-
Turbidity, NTU	42.31	5.20	-	-
Remarks	Duplicate sample B11MW		Depth to water only	Depth to water only

Notes:

Survey conducted by Shannon & Wilson on August 16, 2016. Elevations are relative an to arbitrary on-site benchmark.

Water quality parameters were measured with a Hanna water quality instrument and Hach turbidimeter.

- = Not applicable or not measured
^{o}C = Degrees Celsius
µS/cm = microsiemens per centimeter
mV = Millivolts
NTU = Nephelometric Turbidity Unit
NS = Not sampled
SP = Submersible pump
TOC = Top of casing

TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Parameter Tested	Method*	Cleanup Level***	Sample ID Number^ and Water Depth in Feet BTOC or Sample Date (See Table 1 and Figure 2)			
			Monitoring Well			Trip Blank
			B1MW 10.55	B11MW~ 10.55	B2MW 9.38	TB 9/27/2017
Gasoline Range Organics (GRO) - mg/L	AK 101	2.2	**83.4**	**86.0**	<0.0500	<0.0500
Diesel Range Organics (DRO) - mg/L	AK 102	1.5	**12.8**	**13.8**	<0.577 B	-
Aromatic Volatile Organics (BTEX)						
Benzene - mg/L	EPA 8021B	0.0046	**10.4**	**10.3**	**0.000390 J**	<0.000250
Toluene - mg/L	EPA 8021B	1.1	**23.0**	**23.4**	<0.00134 B	**0.000410 J**
Ethylbenzene - mg/L	EPA 8021B	0.015	**2.64**	**2.65**	<0.000500	<0.000500
Xylenes - mg/L	EPA 8021B	0.19	**15.8**	**15.9**	<0.00300 B	**0.000620 J**

Notes:

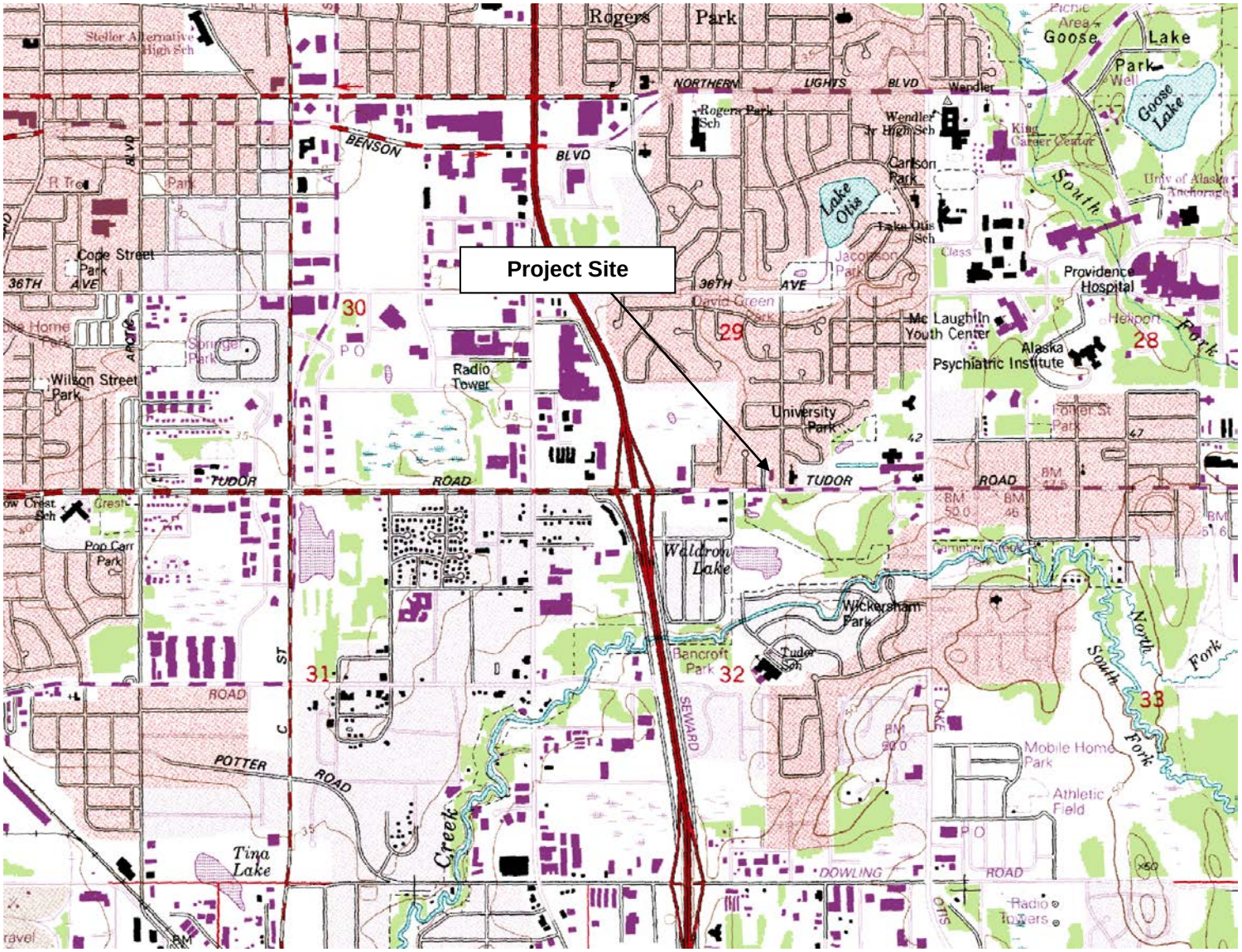
*	= See Attachment 2 for compounds tested, methods, and laboratory reporting limits
**	= Groundwater cleanup levels are listed in Table C, 18 AAC 75.345 (July 2017)
^	= Sample ID number preceded by "17628-" on the chain of custody form
~	= Field duplicate of preceding sample
-	= Not applicable or sample not tested for this analyte
mg/L	= Milligrams per liter
J	= Concentration is an estimate less than the laboratory's limit of quantitation (LOQ). See the TestAmerica laboratory report for details.
<0.0500	= Analyte not detected; laboratory limit of detection of 0.0500 mg/L
0.000390	= Analyte detected
83.4	= Reported concentration exceeds the ADEC Table C cleanup level
BTOC	= Below top of casing
B	= Analyte concentration potentially affected by trip blank or method blank concentration. See ADEC LDRC in attachment 2 for details.

TABLE 3
HISTORICAL GROUNDWATER DATA

Well No.	Sample Date	Groundwater Depth^ (feet)	Target Analyte Concentrations (mg/L)						
			GRO	DRO	RRO	Benzene	Toluene	Ethylbenzene	Xylenes
B1MW	7/16/2008	9.95	**128**	**5.75**	<0.926	**23.5**	**33.7**	**4.97**	**15.7**
	3/1/2013	11.48	Not Sampled - Contained 0.03 foot of Product			-	-	-	-
	2/26/2014	10.97	Not Sampled - Contained 0.01 foot of Product			-	-	-	-
	7/30/2014	7.70	**138**	**18.1**	-	**7.69**	**29.7**	**2.40**	**15.6**
	8/11/2016	11.29	Not Sampled - Contained 0.01 foot of Product			-	-	-	-
	9/27/2017~	10.55	**86.0**	**13.8**	-	**10.4**	**23.4**	**2.65**	**15.9**
B2MW	3/1/2013	10.23	**0.0387 J**	**1.81**	-	**0.00279**	<0.000620	**0.00321**	<0.00186
	2/26/2014	9.90	<0.100 B	<0.792 B	-	**0.000150 J**	<0.000500	<0.000500	<0.00150
	7/30/2014	6.62	<0.0500 B	<0.424 B	-	**0.000701**	<0.00383 B	<0.00100 B	<0.00316 B
	8/11/2016	9.98	<0.0500	<0.300	<0.500 B	<0.000250	<0.000500	<0.000500	<0.00150
	9/27/2017	9.38	<0.0500	<0.577 B	-	**0.000390 J**	<0.00134 B	<0.000500	<0.00300 B
B3MW	3/1/2013	10.73	<0.0620	<0.376	-	<0.000300	<0.000620	<0.000620	<0.00150
	2/26/2014	10.33	DTW Measurement Only		-	-	-	-	-
	7/30/2014	6.83	DTW Measurement Only		-	-	-	-	-
	8/11/2016	10.70	<0.0500	<0.300	<0.500 B	<0.000250	<0.000500	<0.000500	<0.00150
	9/27/2017	10.00	DTW measurement only						
B4MW	3/1/2013	11.35	<0.100 B	<0.370	-	<0.000300	<0.000620	<0.00100 B	<0.00300 B
	2/26/2014	10.98	DTW Measurement Only		-	-	-	-	-
	7/30/2014	7.88	DTW Measurement Only		-	-	-	-	-
	8/11/2016	11.40	<0.0500	<0.294	<0.490 B	<0.000250	<0.000500	<0.000500	<0.00150
	9/27/2017	10.60	DTW Measurement Only						

Notes:

-	Sample not tested for this analyte.
^	Depth of static groundwater level below the measuring point or top of casing.
<0.0500	Analyte not detected; laboratory limit of detection of 0.0500 mg/L.
0.00279	Analyte detected.
128	Analyte concentration exceeds ADEC Table C cleanup level
J	Estimated concentration detected below the reporting limit.
B	Analyte concentration potentially affected by method blank and/or trip blank concentration. See ADEC LDRC in Attachment 2 for details.
DTW	Depth to Water
mg/L	milligrams per liter
~	Maximum result of the primary sample and duplicate sample is listed.



Elevation in Meters
Contour Interval 5 Meters
Taken from Anchorage A-8 NW Quadrangle
U.S. Geological Survey (1994)

0 2,000 4,000

Approximate Scale in Feet

N

4350 MacInnes Street
Anchorage, Alaska

VICINITY MAP

November 2017 32-1-17628-003

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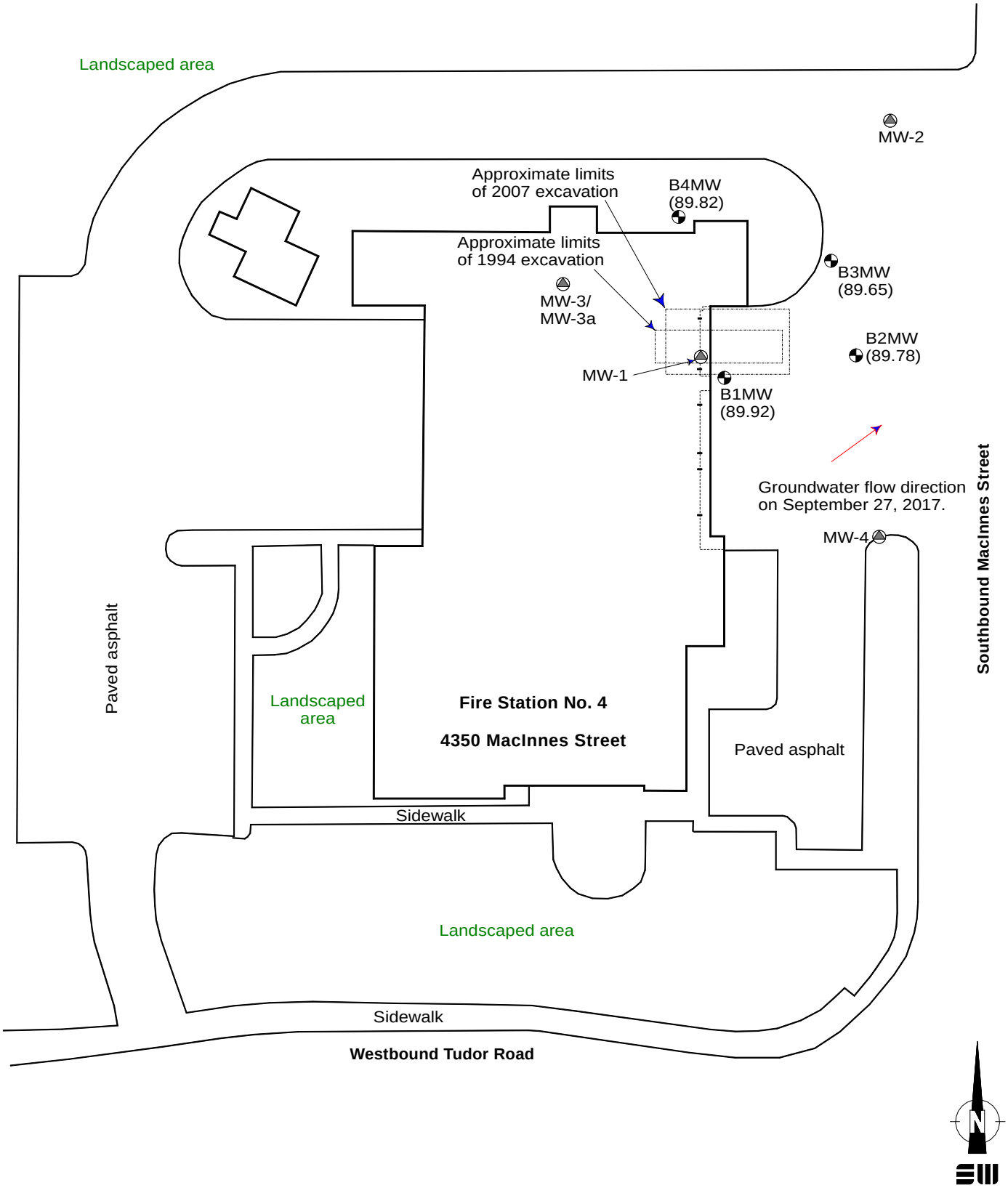
Fig. 1



LEGEND

B1MW — Approximate location of Monitoring Well B1MW. Shannon & Wilson installed Well B1MW in 2008, Wells B2MW and B3MW on February 22, 2013, and Well B4MW on April 15, 2013. Approximate groundwater elevation based on February 26, 2014 level-loop survey and September 27, 2017 water level measurements.

MW-3 — Approximate former location of Monitoring Well MW-3, installed by HartCrowser in 1994 and decommissioned in 2007.

4350 MacInnes Street
Anchorage, Alaska

SITE PLAN

November 2017

32-1-17628-003

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Fig. 2

ATTACHMENT 1

FIELD NOTES

LOW-FLOW WATER SAMPLING LOG

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Job No: 17628-003 Location: Fire Station No.4 Weather: Overcast 55°F
Well No.: BIMW
Date: 9/27/17 Time Started: 1515 Time Completed: 1630
Develop Date: — Develop End Time: — (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1345 Date of Depth Measurement: 9/27/17
Measuring Point (MP): (Top of PVC Casing) / Top of Steel Protective Casing / Other: _____
Diameter of Casing: 2" Well Screen Interval: —
Total Depth of Well Below MP: 14.47 Product Thickness, if noted: None. Strong HC odor on probe
Depth-to-Water (DTW) Below MP: 10.55
Water Column in Well: 3.92 (Total Depth of Well Below MP - DTW Below MP)
Gallons per foot: 0.16
Gallons in Well: 0.63 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 9/27/17 Time Started: 1515 Time Completed: 1600
Three Well Volumes: 1.89 (Gallons in Well x 3)
Gallons Purged: 1.8 Depth of Pump (generally 2 ft from ~~bottom~~ water): ~11.5
Max. Drawdown (generally 0.3 ft): 0.41 Pump Rate: 0.3
Well Purged Dry: Yes ☐ No ☒ (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1520	0.2	0.3	-	-	12.5	767	-	6.80	-	11.60
1525	0.4	↓	-	-	12.7	768	-	6.63	-	25.97
1530	0.6		10.76	0.21	12.9	780	-	6.55	-	19.95
1535	0.8		-	-	13.3	776	-	6.54	-	81.52
1540	1.0		-	-	13.4	799	-	6.54	-	55.77
1545	1.2		10.95	0.40	13.5	789	-	6.54	-	64.82

SAMPLING DATA

Odor: Hydrocarbon odor - Strong Color: Clear
Sample Designation: 17628-BIMW Time / Date: 1602 9/27/17
QC Sample Designation: 17628-BIIMW Time / Date: 1630 9/27/17
QA Sample Designation: — Time / Date: —

Evacuation Method: (Submersible Pump) / Other: _____
Sampling Method: (Submersible Pump) / Other: _____
Water Quality Instruments Used/Manufacturer/Model Number Hanna #3, turbidimeter #2
Calibration Info (Time, Ranges, etc) _____
Remarks: _____

Sampling Personnel: JJK

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 (2" = 0.16) 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing ~~and 2"~~ well = 0.23

LOW-FLOW WATER SAMPLING LOG

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Continued from previous page

Job No: 17628-003 Location: Fire Station No. 4 Site: _____

Well No.: B1 MW

Date: 9/27/17

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond (uS/cm)	DO (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1550	1.4	0.3	-	-	13.6	789	-	6.54	-	41.47
1555	1.6	0.3	-	-	13.5	791	-	6.54	-	40.24
1600	1.8	0.3	10.96	0.41	13.6	795	-	6.55	-	42.31

	Interval (minutes)	Pump Rate (mL/min):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
ADEC (May 2010)	3 to 5	100 to 150	<0.0328	±3% or ±0.2	±3%	±10%	±0.1	±10	±10%
EPA (Jan. 2010)	5	50	<0.3	±3%	±3%	±10%	±0.1	±10	±10% or <5 NTU

EPA guidance requires all parameters to stabilize for 3 consecutive readings before sampling. If not stable within 2 hours, collect sample.

ADEC guidance requires 3 parameters (4 if using temperature) to stabilize for 3 consecutive readings before sampling.

Shannon & Wilson, Inc.

LOW-FLOW WATER SAMPLING LOG

Job No: 17628-003 Location: Fire Station No. 4 Weather: Overcast 55°F
Well No.: B2MW
Date: 9/27/17 Time Started: 1350 Time Completed: 1450
Develop Date: — Develop End Time: — (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1340 Date of Depth Measurement: 9/27/17
Measuring Point (MP): (Top of PVC Casing) / Top of Steel Protective Casing / Other: _____
Diameter of Casing: 2" Well Screen Interval: —
Total Depth of Well Below MP: 15.20 Product Thickness, if noted: None
Depth-to-Water (DTW) Below MP: 9.38
Water Column in Well: 5.82 (Total Depth of Well Below MP - DTW Below MP)
Gallons per foot: 0.16
Gallons in Well: 0.93 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 9/27/17 Time Started: 1355 Time Completed: 1440
Three Well Volumes: 2.82 (Gallons in Well x 3)
Gallons Purged: 1.8 Depth of Pump (generally 2 ft from ~~bottom~~ water): ~10.5
Max. Drawdown (generally 0.3 ft): 0.72 Pump Rate: 0.8 - 0.4 L/min
Well Purged Dry: Yes ☐ No ☒ (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
					0.2	±3%		0.1		10%
1400	0.2	0.3	—	—	12.5	499	—	6.53	—	19.20
1405	0.4		—	—	12.5	393	—	6.47 ✓	—	19.90
1410	0.6		9.70	0.32	12.6 ✓	390 ✓	—	6.40 ✓	—	18.16
1415	0.8		—	—	12.7~~4~~	391 ✓	—	6.41 ✓	—	11.68
1420	1.0		—	—	12.9 ✓	401 ✓	—	6.41 ✓	—	8.85
1425	1.2	↓	9.70	0.32	13.0 ✓	397 ✓	—	6.39 ✓	—	6.30 ✓
~~1430~~	~~1.4~~									

SAMPLING DATA

Odor: None Color: Clear
Sample Designation: 17682 - B2MW Time / Date: * 1441 9/27/17
QC Sample Designation: — Time / Date: —
QA Sample Designation: — Time / Date: —

Evacuation Method: (Submersible Pump) / Other: _____
Sampling Method: (Submersible Pump) / Other: _____

Water Quality Instruments Used/Manufacturer/Model Number Hanna #3, Turbidimeter #2

Calibration Info (Time, Ranges, etc) _____

Remarks: Bentonite covering well cap. Had to clean out

Sampling Personnel: JCT & JJK

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 (2" = 0.16) 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

Shannon & Wilson, Inc.

LOW-FLOW WATER SAMPLING LOG

Continued from previous page

Job No: 17628-003 Location: Fire Station No. 4 Site: _____
Well No.: B2MW
Date: 9/27/17

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond (uS/cm)	DO (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1430	1.4	0.3	-	-	13.0	443	-	6.38	-	5.81 ✓
1435	1.6	↓	-	-	13.1 ✓	450	-	6.37 ✓	-	4.94 ✓
1440	1.8				13.1	445	-	6.40	-	5.20 ✓

	Interval (minutes)	Pump Rate (mL/min):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
ADEC (May 2010)	3 to 5	100 to 150	<0.0328	±3% or ±0.2	±3%	±10%	±0.1	±10	±10%
EPA (Jan. 2010)	5	50	<0.3	±3%	±3%	±10%	±0.1	±10	±10% or <5 NTU

EPA guidance requires all parameters to stabilize for 3 consecutive readings before sampling. If not stable within 2 hours, collect sample.
ADEC guidance requires 3 parameters (4 if using temperature) to stabilize for 3 consecutive readings before sampling.

LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 490-17628-003 Location: FIRE STATION No. 4 Weather: OVERCAST 55°F

Well No.: B3MW

Date: 9/27/17 Time Started: — Time Completed: —

Develop Date: — Develop End Time: — (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1330 Date of Depth Measurement: 9/27/17

Measuring Point (MP): (Top of PVC Casing) / Top of Steel Protective Casing / Other: _____

Diameter of Casing: 2" Well Screen Interval: —

Total Depth of Well Below MP: 15.28 Product Thickness, if noted: NONE

Depth-to-Water (DTW) Below MP: 10.00

Water Column in Well: _____ (Total Depth of Well Below MP - DTW Below MP)

Gallons per foot: 0.16

Gallons in Well: _____ (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: _____ Time Started: _____ Time Completed: _____

Three Well Volumes: _____ (Gallons in Well x 3)

Gallons Purged: _____ Depth of Pump (generally 2 ft from bottom): _____

Max. Drawdown (generally 0.3 ft): _____ Pump Rate: _____

Well Purged Dry: Yes ☐ No ☐ (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)

SAMPLING DATA

Odor: _____ Color: _____

Sample Designation: _____ Time / Date: _____

QC Sample Designation: _____ Time / Date: _____

QA Sample Designation: _____ Time / Date: _____

Evacuation Method: Submersible Pump / Other: _____

Sampling Method: Submersible Pump / Other: _____

Water Quality Instruments Used/Manufacturer/Model Number _____

Calibration Info (Time, Ranges, etc) _____

Remarks: DEPTH TO WATER ONLY. BENTONITE SURROUNDING WELL CAP HAD TO CLEAN OUT. ONE SCREW SOCKET BROKEN. COULD USE NEW MONUMENT.

Sampling Personnel: JLT

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65

ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 32-1-17628-003 Location: Fire Station No. 4 Weather: Overcast 55°F

Well No.: B4MW

Date: 9/27/17 Time Started: — Time Completed: —

Develop Date: — Develop End Time: — (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1315 Date of Depth Measurement: 9/27/17

Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: _____

Diameter of Casing: 2" Well Screen Interval: —

Total Depth of Well Below MP: 14.89 Product Thickness, if noted: None

Depth-to-Water (DTW) Below MP: 10.60

Water Column in Well: 4.29 (Total Depth of Well Below MP - DTW Below MP)

Gallons per foot: 0.16

Gallons in Well: 0.68 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: _____ Time Started: _____ Time Completed: _____

Three Well Volumes: _____ (Gallons in Well x 3)

Gallons Purged: _____ Depth of Pump (generally 2 ft from bottom): _____

Max. Drawdown (generally 0.3 ft): _____ Pump Rate: _____

Well Purged Dry: Yes ☐ No ☐ (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)

SAMPLING DATA

Odor: None Color: —

Sample Designation: _____ Time / Date: _____

QC Sample Designation: _____ Time / Date: _____

QA Sample Designation: _____ Time / Date: _____

Evacuation Method: Submersible Pump / Other: _____

Sampling Method: Submersible Pump / Other: _____

Water Quality Instruments Used/Manufacturer/Model Number _____

Calibration Info (Time, Ranges, etc) _____

Remarks: Depth to water only

Sampling Personnel: _____

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65

ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

ATTACHMENT 2

RESULTS OF ANALYTICAL TESTING BY

SGS NORTH AMERICA INC. OF ANCHORAGE, ALASKA

AND

ADEC LABORATORY DATA REVIEW CHECKLIST

Laboratory Report of Analysis

To: Shannon & Wilson, Inc.
5430 Fairbanks St. Suite 3
Anchorage, AK 99518
(907)561-2120

Report Number: **1176914**

Client Project: **FS No.4 17628-003**

Dear Jacob Tracy,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Victoria at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Victoria Pennick Date
Project Manager
Victoria.Pennick@sgs.com

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Case Narrative

SGS Client: **Shannon & Wilson, Inc.**
SGS Project: **1176914**
Project Name/Site: **FS No.4 17628-003**
Project Contact: **Jacob Tracy**

Refer to sample receipt form for information on sample condition.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Print Date: 10/04/2017 4:23:37PM

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) for which SGS North America Inc. is Provisionally Certified as of 9/21/2017 & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
17628-B1MW	1176914001	09/27/2017	09/27/2017	Water (Surface, Eff., Ground)
17628-B11MW	1176914002	09/27/2017	09/27/2017	Water (Surface, Eff., Ground)
17628-B2MW	1176914003	09/27/2017	09/27/2017	Water (Surface, Eff., Ground)
17628-TB	1176914004	09/27/2017	09/27/2017	Water (Surface, Eff., Ground)

Method	Method Description
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.
AK102	DRO Low Volume (W)

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Detectable Results Summary

Client Sample ID: **17628-B1MW**
Lab Sample ID: 1176914001
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	12.8	mg/L
Benzene	10400	ug/L
Ethylbenzene	2640	ug/L
Gasoline Range Organics	83.4	mg/L
o-Xylene	4010	ug/L
P & M -Xylene	11800	ug/L
Toluene	23000	ug/L

Client Sample ID: **17628-B11MW**
Lab Sample ID: 1176914002
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	13.8	mg/L
Benzene	10300	ug/L
Ethylbenzene	2650	ug/L
Gasoline Range Organics	86.0	mg/L
o-Xylene	4020	ug/L
P & M -Xylene	11900	ug/L
Toluene	23400	ug/L

Client Sample ID: **17628-B2MW**
Lab Sample ID: 1176914003
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	0.254J	mg/L
Benzene	0.390J	ug/L
o-Xylene	0.480J	ug/L
P & M -Xylene	1.11J	ug/L
Toluene	1.34	ug/L

Client Sample ID: **17628-TB**
Lab Sample ID: 1176914004
Volatile Fuels

Parameter	Result	Units
P & M -Xylene	0.620J	ug/L
Toluene	0.410J	ug/L

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Results of **17628-B1MW**

Client Sample ID: **17628-B1MW**
Client Project ID: **FS No.4 17628-003**
Lab Sample ID: 1176914001
Lab Project ID: 1176914

Collection Date: 09/27/17 16:02
Received Date: 09/27/17 17:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	12.8		0.566	0.170	mg/L	1		10/03/17 06:41
Surrogates								
5a Androstane (surr)	62.7		50-150		%	1		10/03/17 06:41

Batch Information

Analytical Batch: XFC13855
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 10/03/17 06:41
Container ID: 1176914001-D

Prep Batch: XXX38565
Prep Method: SW3520C
Prep Date/Time: 10/02/17 08:49
Prep Initial Wt./Vol.: 265 mL
Prep Extract Vol: 1 mL

Print Date: 10/04/2017 4:23:40PM

J flagging is activated

Results of **17628-B1MW**

Client Sample ID: **17628-B1MW**
Client Project ID: **FS No.4 17628-003**
Lab Sample ID: 1176914001
Lab Project ID: 1176914

Collection Date: 09/27/17 16:02
Received Date: 09/27/17 17:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	83.4		10.0	3.10	mg/L	100		09/29/17 16:20
Surrogates								
4-Bromofluorobenzene (surr)	87.8		50-150		%	100		09/29/17 16:20

Batch Information

Analytical Batch: VFC13914
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/29/17 16:20
Container ID: 1176914001-B

Prep Batch: VXX31404
Prep Method: SW5030B
Prep Date/Time: 09/29/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	10400		50.0	15.0	ug/L	100		09/29/17 16:20
Ethylbenzene	2640		100	31.0	ug/L	100		09/29/17 16:20
o-Xylene	4010		100	31.0	ug/L	100		09/29/17 16:20
P & M -Xylene	11800		200	62.0	ug/L	100		09/29/17 16:20
Toluene	23000		200	62.0	ug/L	200		10/02/17 14:46
Surrogates								
1,4-Difluorobenzene (surr)	98.5		77-115		%	100		09/29/17 16:20

Batch Information

Analytical Batch: VFC13917
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 10/02/17 14:46
Container ID: 1176914001-C

Prep Batch: VXX31416
Prep Method: SW5030B
Prep Date/Time: 10/02/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VFC13914
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/29/17 16:20
Container ID: 1176914001-B

Prep Batch: VXX31404
Prep Method: SW5030B
Prep Date/Time: 09/29/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/04/2017 4:23:40PM

J flagging is activated

Results of **17628-B11MW**

Client Sample ID: **17628-B11MW**
Client Project ID: **FS No.4 17628-003**
Lab Sample ID: 1176914002
Lab Project ID: 1176914

Collection Date: 09/27/17 16:30
Received Date: 09/27/17 17:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	13.8		0.566	0.170	mg/L	1		10/03/17 07:02
Surrogates								
5a Androstane (surr)	65.5		50-150		%	1		10/03/17 07:02

Batch Information

Analytical Batch: XFC13855
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 10/03/17 07:02
Container ID: 1176914002-D

Prep Batch: XXX38565
Prep Method: SW3520C
Prep Date/Time: 10/02/17 08:49
Prep Initial Wt./Vol.: 265 mL
Prep Extract Vol: 1 mL

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Results of **17628-B11MW**

Client Sample ID: **17628-B11MW**
Client Project ID: **FS No.4 17628-003**
Lab Sample ID: 1176914002
Lab Project ID: 1176914

Collection Date: 09/27/17 16:30
Received Date: 09/27/17 17:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	86.0		10.0	3.10	mg/L	100		09/29/17 16:39
Surrogates								
4-Bromofluorobenzene (surr)	88.3		50-150		%	100		09/29/17 16:39

Batch Information

Analytical Batch: VFC13914
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/29/17 16:39
Container ID: 1176914002-B

Prep Batch: VXX31404
Prep Method: SW5030B
Prep Date/Time: 09/29/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	10300		50.0	15.0	ug/L	100		09/29/17 16:39
Ethylbenzene	2650		100	31.0	ug/L	100		09/29/17 16:39
o-Xylene	4020		100	31.0	ug/L	100		09/29/17 16:39
P & M -Xylene	11900		200	62.0	ug/L	100		09/29/17 16:39
Toluene	23400		100	31.0	ug/L	100		09/29/17 16:39
Surrogates								
1,4-Difluorobenzene (surr)	99.9		77-115		%	100		09/29/17 16:39

Batch Information

Analytical Batch: VFC13914
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/29/17 16:39
Container ID: 1176914002-B

Prep Batch: VXX31404
Prep Method: SW5030B
Prep Date/Time: 09/29/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **17628-B2MW**

Client Sample ID: **17628-B2MW**
Client Project ID: **FS No.4 17628-003**
Lab Sample ID: 1176914003
Lab Project ID: 1176914

Collection Date: 09/27/17 14:41
Received Date: 09/27/17 17:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.254	J	0.577	0.173	mg/L	1		10/03/17 07:23
Surrogates								
5a Androstane (surr)	67.8		50-150		%	1		10/03/17 07:23

Batch Information

Analytical Batch: XFC13855
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 10/03/17 07:23
Container ID: 1176914003-D

Prep Batch: XXX38565
Prep Method: SW3520C
Prep Date/Time: 10/02/17 08:49
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Print Date: 10/04/2017 4:23:40PM

J flagging is activated

Results of **17628-B2MW**

Client Sample ID: **17628-B2MW**
Client Project ID: **FS No.4 17628-003**
Lab Sample ID: 1176914003
Lab Project ID: 1176914

Collection Date: 09/27/17 14:41
Received Date: 09/27/17 17:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500 U		0.100	0.0310	mg/L	1		09/29/17 16:58
Surrogates								
4-Bromofluorobenzene (surr)	83.6		50-150		%	1		09/29/17 16:58

Batch Information

Analytical Batch: VFC13914
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/29/17 16:58
Container ID: 1176914003-B

Prep Batch: VXX31404
Prep Method: SW5030B
Prep Date/Time: 09/29/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.390 J		0.500	0.150	ug/L	1		09/29/17 16:58
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		09/29/17 16:58
o-Xylene	0.480 J		1.00	0.310	ug/L	1		09/29/17 16:58
P & M -Xylene	1.11 J		2.00	0.620	ug/L	1		09/29/17 16:58
Toluene	1.34		1.00	0.310	ug/L	1		09/29/17 16:58
Surrogates								
1,4-Difluorobenzene (surr)	90.4		77-115		%	1		09/29/17 16:58

Batch Information

Analytical Batch: VFC13914
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/29/17 16:58
Container ID: 1176914003-B

Prep Batch: VXX31404
Prep Method: SW5030B
Prep Date/Time: 09/29/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/04/2017 4:23:40PM

J flagging is activated

Results of **17628-TB**

Client Sample ID: **17628-TB**
Client Project ID: **FS No.4 17628-003**
Lab Sample ID: 1176914004
Lab Project ID: 1176914

Collection Date: 09/27/17 12:00
Received Date: 09/27/17 17:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		09/29/17 13:28
Surrogates								
4-Bromofluorobenzene (surr)	80.8		50-150		%	1		09/29/17 13:28

Batch Information

Analytical Batch: VFC13914
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/29/17 13:28
Container ID: 1176914004-C

Prep Batch: VXX31404
Prep Method: SW5030B
Prep Date/Time: 09/29/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250	U	0.500	0.150	ug/L	1		09/29/17 13:28
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/29/17 13:28
o-Xylene	0.500	U	1.00	0.310	ug/L	1		09/29/17 13:28
P & M -Xylene	0.620	J	2.00	0.620	ug/L	1		09/29/17 13:28
Toluene	0.410	J	1.00	0.310	ug/L	1		09/29/17 13:28
Surrogates								
1,4-Difluorobenzene (surr)	90.7		77-115		%	1		09/29/17 13:28

Batch Information

Analytical Batch: VFC13914
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/29/17 13:28
Container ID: 1176914004-C

Prep Batch: VXX31404
Prep Method: SW5030B
Prep Date/Time: 09/29/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/04/2017 4:23:40PM

J flagging is activated

Method Blank

Blank ID: MB for HBN 1769376 [VXX/31404]
Blank Lab ID: 1417044

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1176914001, 1176914002, 1176914003, 1176914004

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	77.9	50-150		%

Batch Information

Analytical Batch: VFC13914
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 9/29/2017 12:12:00PM

Prep Batch: VXX31404
Prep Method: SW5030B
Prep Date/Time: 9/29/2017 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176914 [VXX31404]
Blank Spike Lab ID: 1417047
Date Analyzed: 09/29/2017 13:09

Spike Duplicate ID: LCSD for HBN 1176914 [VXX31404]
Spike Duplicate Lab ID: 1417048
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176914001, 1176914002, 1176914003, 1176914004

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	0.984	98	1.00	0.959	96	(60-120)	2.60	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	87.2	87	0.0500	88.3	88	(50-150)	1.20	

Batch Information

Analytical Batch: **VFC13914**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX31404**
Prep Method: **SW5030B**
Prep Date/Time: **09/29/2017 08:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Method Blank

Blank ID: MB for HBN 1769376 [VXX/31404]
Blank Lab ID: 1417044

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1176914001, 1176914002, 1176914003, 1176914004

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	88.3	77-115		%

Batch Information

Analytical Batch: VFC13914
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 9/29/2017 12:12:00PM

Prep Batch: VXX31404
Prep Method: SW5030B
Prep Date/Time: 9/29/2017 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176914 [VXX31404]
Blank Spike Lab ID: 1417045
Date Analyzed: 09/29/2017 12:50

Spike Duplicate ID: LCSD for HBN 1176914 [VXX31404]
Spike Duplicate Lab ID: 1417046
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176914001, 1176914002, 1176914003, 1176914004

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	97.3	97	100	104	104	(80-120)	7.00	(< 20)
Ethylbenzene	100	104	104	100	113	113	(75-125)	8.10	(< 20)
o-Xylene	100	102	102	100	113	113	(80-120)	9.60	(< 20)
P & M -Xylene	200	206	103	200	226	113	(75-130)	8.80	(< 20)
Toluene	100	104	104	100	113	113	(75-120)	8.60	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50	100	100	50	103	103	(77-115)	2.70	

Batch Information

Analytical Batch: **VFC13914**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX31404**
Prep Method: **SW5030B**
Prep Date/Time: **09/29/2017 08:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

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200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Method Blank

Blank ID: MB for HBN 1769476 [VXX/31416]
Blank Lab ID: 1417484

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1176914001

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Toluene	0.500U	1.00	0.310	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	89.6	77-115		%

Batch Information

Analytical Batch: VFC13917
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 10/2/2017 12:52:00PM

Prep Batch: VXX31416
Prep Method: SW5030B
Prep Date/Time: 10/2/2017 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176914 [VXX31416]
Blank Spike Lab ID: 1417485
Date Analyzed: 10/02/2017 13:30

Spike Duplicate ID: LCSD for HBN 1176914 [VXX31416]
Spike Duplicate Lab ID: 1417486
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176914001

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Toluene	100	99.1	99	100	104	104	(75-120)	5.10	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50	102	102	50	102	102	(77-115)	0.06	

Batch Information

Analytical Batch: **VFC13917**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX31416**
Prep Method: **SW5030B**
Prep Date/Time: **10/02/2017 08:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1769401 [XXX/38565]
Blank Lab ID: 1417161

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1176914001, 1176914002, 1176914003

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.225J	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	71	60-120		%

Batch Information

Analytical Batch: XFC13855
Analytical Method: AK102
Instrument: HP 7890A FID SV E F
Analyst: JMG
Analytical Date/Time: 10/3/2017 5:39:00AM

Prep Batch: XXX38565
Prep Method: SW3520C
Prep Date/Time: 10/2/2017 8:49:03AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176914 [XXX38565]
Blank Spike Lab ID: 1417162
Date Analyzed: 10/03/2017 06:00

Spike Duplicate ID: LCSD for HBN 1176914 [XXX38565]
Spike Duplicate Lab ID: 1417163
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176914001, 1176914002, 1176914003

Results by **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	20	15.5	77	20	15.8	79	(75-125)	2.30	(< 20)
Surrogates									
5a Androstane (surr)	0.4	73.6	74	0.4	79.5	80	(60-120)	7.70	

Batch Information

Analytical Batch: **XFC13855**
Analytical Method: **AK102**
Instrument: **HP 7890A FID SV E F**
Analyst: **JMG**

Prep Batch: **XXX38565**
Prep Method: **SW3520C**
Prep Date/Time: **10/02/2017 08:49**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

1176914

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN OF CUSTODY RECORD

Page 1 of 1

Laboratory SGS
Attn: Tom

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2043 Westport Center Drive
St. Louis, ~~MO 63146-3564~~
(314) 699-9660

2705 Saint Andrews Loop, Suite A
Pasco, WA 99301-3378
(509) 946-6309

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

3990 Collins Way, Suite 100
Lake Oswego, OR 97035
(503) 223-6147

1321 Bannock Street, Suite 200
Denver, CO 80204
(303) 825-3800

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	GRO 8015 BTEX EPA 8021B	DRO 8015					Total Number of Containers	Remarks/Matrix
17628 - B1MW	(1)A-E	1602	9/27/17		X	X	X					5	GROUNDWATER
B1MW	(2)A-E	1630			X	X	X					5	
B2MW	(3)A-E	1441			X	X	X					5	
TB	(4)A-C	1200				X						1	TRIP BLANK

Project Information	Sample Receipt
Project Number: 17628-003	Total Number of Containers
Project Name: FS No. 4	COC Seals/Intact? Y/N/NA (Hand)
Contact: JCT	Received Good Cond./Cold 13.7
Ongoing Project? Yes ☒ No ☐	Delivery Method: D41
Sampler: ~~TOT~~ JK	(attach shipping bill, if any)

Instructions
Requested Turnaround Time: STANDARD
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature:	Signature:	Signature:
Time: 5:25	Time:	Time:
Printed Name: Jake Ickles	Printed Name:	Printed Name:
Date: 9/27/17	Date:	Date:
Company:	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature:	Signature:	Signature:
Time:	Time:	Time: 1725
Printed Name:	Printed Name:	Printed Name: Anne Colip
Date:	Date:	Date: 9/27/17
Company:	Company:	Company: SGS

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

F-19-91/UR

No. 35462

e-Sample Receipt Form

SGS Workorder #: **1176914**

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		Yes — Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	Hand Delivered
COC accompanied samples?	Yes	
Yes — **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	No	Cooler ID: 1 @ 13.7 °C Therm. ID: D41
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	Yes	
If <0°C, were sample containers ice free?	N/A	
If samples received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	Yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	Yes	
**Note: If times differ <1hr, record details & login per COC.		
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	Yes	
	N/A	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	Yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	Yes	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1176914001-A	HCL to pH < 2	OK			
1176914001-B	HCL to pH < 2	OK			
1176914001-C	HCL to pH < 2	OK			
1176914001-D	HCL to pH < 2	OK			
1176914001-E	HCL to pH < 2	OK			
1176914002-A	HCL to pH < 2	OK			
1176914002-B	HCL to pH < 2	OK			
1176914002-C	HCL to pH < 2	OK			
1176914002-D	HCL to pH < 2	OK			
1176914002-E	HCL to pH < 2	OK			
1176914003-A	HCL to pH < 2	OK			
1176914003-B	HCL to pH < 2	OK			
1176914003-C	HCL to pH < 2	OK			
1176914003-D	HCL to pH < 2	OK			
1176914003-E	HCL to pH < 2	OK			
1176914004-A	HCL to pH < 2	OK			
1176914004-B	HCL to pH < 2	OK			
1176914004-C	HCL to pH < 2	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM- The container was received damaged.
FR- The container was received frozen and not usable for Bacteria or BOD analyses.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

LABORATORY DATA REVIEW CHECKLIST

Completed by: Jake Kesler
Title: Environmental Staff
Date: October 2017

CS Report Name: Groundwater Monitoring, Fire Station No. 4, 4350 MacInnes Street, Anchorage, Alaska

Laboratory Report Date: October 4, 2017

Consultant Firm: Shannon & Wilson, Inc.

Laboratory Name: SGS North America, Inc.
Laboratory Report Number: 1176914

ADEC File Number: *2100.26.315*
ADEC RecKey Number: *NA*
(**NOTE**: ***NA*** = not applicable; Text in *italics* added by Shannon & Wilson, Inc.)

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses? **Yes / No / NA** (please explain)
Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS-approved?
Yes / No / NA (please explain)
Comments:

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?
Yes / No / NA (please explain)
Comments**:**

b. Correct analyses requested? **Yes / No / NA** (please explain)
Comments**:**

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?
Yes / No / NA (please explain)
Comments: *The cooler temperature was 13.7 ° C.*

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)? **Yes / No / NA** (please explain)
Comments:

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)? **Yes / No / NA** (please explain)
Comments:

d. If there were any discrepancies, were they documented? – For example, incorrect sample containers/preservation, sample temperature outside acceptance range, insufficient or missing samples, etc.? **Yes / No / NA** (please explain)
Comments: *The laboratory noted that the temperature blank temperature was outside of QC range.*

e. Data quality or usability affected? Please explain. **NA**
Comments: *The samples were submitted to the laboratory within 3 hours of sample collection. Therefore, it is our opinion that the elevated cooler temperature does not impact data usability.*

4. Case Narrative

a. Present and understandable? **Yes / No / NA** (please explain)
Comments:

b. Discrepancies, errors, or QC failures identified by the lab? **Yes / No / NA** (please explain)
Comments: The *case narrative referred to the sample receipt form for information on sample condition.*

c. Were corrective actions documented? **Yes / No / NA** (please explain)
Comments:

d. What is the effect on data quality/usability, according to the case narrative?
Comments: *The case narrative does not comment on data quality/usability.*

5. Sample Results

a. Correct analyses performed/reported as requested on COC? **Yes / No / NA** (please explain)
Comments:

b. All applicable holding times met? **Yes / No / NA** (please explain)
Comments:

All soils reported on a dry weight basis? **Yes / No / NA** (please explain)
Comments:

c. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project? **Yes / No / NA** (please explain)
Comments:

d. Data quality or usability affected? **NA** Please explain.
Comments:

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis, and 20 samples?
Yes / No / NA (please explain)
Comments:

ii. All method blank results less than LOQ? **Yes / No / NA** (please explain)
Comments: *Although less than the LOQ, an estimated (J-flagged) concentration of DRO (0.225 J mg/L) was detected in the method blank.*

iii. If above LOQ, what samples are affected? ***NA***
Comments: Although less than the LOQ, all samples are potentially affected.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes / No / NA (please explain)
Comments: *An estimated concentration of DRO (0.254 J mg/L) was detected in Sample B2MW. Because both the B2MW and method blank results are less than the LOQ the B2MW result is reported as non-detect at the LOQ and flagged "B" in Table 2.*

v. Data quality or usability affected? Please explain.
Comments: *The affected sample result is less than the ADEC cleanup level; therefore it is our opinion that the data is acceptable for the purposes of this report.*

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

i. Organics - One LCS/LCSD reported per matrix, analysis, and 20 samples?
(LCS/LCSD required per AK methods, LCS required per SW846) **Yes / No / NA**
(please explain)
Comments:

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples? **Yes / No / NA** (please explain)
Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages) **Yes / No / NA** (please explain)
Comments:

iv. Precision – All relative percent differences (RPDs) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%, VOCs 20%; all other analyses see the laboratory QC pages) **Yes / No / NA** (please explain)
Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected? **NA**
Comments:

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined? **Yes / No / NA** (please explain)
Comments:

vii. Data quality or usability affected? Please explain. ***NA***
Comments:

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses, field, QC and laboratory samples? **Yes / No / NA** (please explain)
Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages) **Yes / No / NA** (please explain)
Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined? **Yes / No / NA** (please explain)
Comments:

iv. Data quality or usability affected? Please explain. ***NA***
Comments:

d. Trip Blank - Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.)

i. One trip blank reported per matrix, analysis and cooler? (If not, enter explanation below.) **Yes / No / NA** (please explain)
Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? **(**If not, a comment stating why must be entered below.) **Yes / No / NA** (please explain)
Comments: *Only one cooler was used to store and transport the samples.*

iii. All results less than LOQ? **Yes / No / NA** (please explain)
Comments: *Although less than the LOQ, concentrations of toluene (0.000410 J mg/L) and xylenes (0.000620 J mg/L) were detected in the trip blank. If the concentrations in both Sample B2MW and trip blank were reported at levels less than the LOQ, therefore toluene and xylenes are reported as non-detect at the LOQ and flagged 'B'.*

iv. If above LOQ, what samples are affected? ***NA***
Comments**:** *See above.*

v. Data quality or usability affected? Please explain. ***NA***
Comments: *The toluene and xylenes results in Sample B2MW are less than the ADEC cleanup levels, therefore it is our opinion that data quality is not affected.*

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples? **Yes / No NA** (please explain)
Comments: *Sample B11MW is the field duplicate of Sample B1MW.*

ii. Submitted blind to the lab? **Yes / No / NA** (please explain)
Comments:

iii. Precision – All relative percent differences (RPDs) less than specified DQOs? (Recommended: 30% for water, 50% for soil) **Yes / No / NA** (please explain)
Comments:

iv. Data quality or usability affected? Please explain. ***NA***
Comments:

f. Decontamination or Equipment Blank (if not applicable)
Yes / No / NA (please explain)
Comments: *The use of a decontamination or equipment blank was not included in our ADEC-approved work plan.*

i. All results less than LOQ? **Yes / No / NA** (please explain)
Comments:

ii. If above LOQ, what samples are affected? ***NA***
Comments:

iii. Data quality or usability affected? Please explain. ***NA***

Comments:

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab-specific, etc.)

a. Defined and appropriate? **Yes / No / NA** (please explain)
Comments: *A key is provided on page 3 of the laboratory report*.

ATTACHMENT 3

INVESTIGATION-DERRIVED WASTE DISPOSAL DOCUMENTS

*** IN CASE OF EMERGENCY CALL 1-800-899-4672 ***

118943 (RP)

NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No.	Manifest Document No. 118943	2. Page 1 of 1

GENERATOR

3. Generator's Name and Mailing Address
MOA FIRE STATION NO. 4
4350 MACINNES STREET
ANCHORAGE, AK 99508

4. Generator's Phone (907) 561-2120

5. Transporter 1 Company Name	6. US EPA ID Number	A. State Transporter's ID (907) 258-1558
NRC ALASKA LLC	AKR000004184	B. Transporter 1 Phone
7. Transporter 2 Company Name	8. US EPA ID Number	C. State Transporter's ID
		D. Transporter 2 Phone
9. Designated Facility Name and Site Address	10. US EPA ID Number	E. State Facility's ID
NRC ALASKA LLC 2020 VIKING DRIVE ANCHORAGE, AK 99501	AKR000004184	F. Facility's Phone (907) 258-1558

HM	11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a.	UN3082, Environmentally hazardous substances, liquid, n.o.s. (BENZENE), 9 , PGIII ERG#171	1	~~DM~~ DF	30	P
b.					
c.					
d.					

G. Additional Descriptions for Materials Listed Above
) EA0306 WATER CONTAMINATED WITH BENZENE

H. Handling Codes for Wastes Listed Above
D12270

15. Special Handling Instructions and Additional Information
Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation

16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name	Signature	Date Month	Day	Year
JAKE TRACY FOR MOA		10	12	17

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month	Day	Year
ROYCE TRISDALE JR		10	12	17

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month	Day	Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name	Signature	Date Month	Day	Year

NON-HAZARDOUS WASTE

ATTACHMENT 4

IMPORTANT INFORMATION ABOUT YOUR

GEOTECHNICAL/ENVIRONMENTAL REPORT

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

Attachment to and part of Report 32-1-17628-003

Date: November 2017
To: Municipality of Anchorage

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include: the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used: (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors which were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland