SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

SEATTLE
RICHLAND
PORTLAND
FAIRBANKS
ANCHORAGE
DENVER
SAINT LOUIS

December 7, 2007

BLM-AK Alaska State Office
222 West 7th Avenue #13
Anchorage, Alaska 99513-7599

Attn: Mr. Wayne Svejnoha

RE: GROUNDWATER MONITORING, RED DEVIL MINE, RED DEVIL, ALASKA

This report presents the results of our September 5, 2007 groundwater sampling conducted at the Red Devil Mine (RDM) in Red Devil, Alaska. The site is administered by the Bureau of Land Management (BLM). The project site is located approximately 2 miles southeast of Red Devil, near the Kuskokwim River. The project purpose was to evaluate the current metals and petroleum hydrocarbon concentrations in the site's groundwater.

The work was conducted under Shannon & Wilson's BLM Contract Number NAC040272. BLM authorization to proceed was issued on May 9, 2007 via an Order for Services, Order Number LAD072006. The project tasks were conducted in general accordance with Shannon & Wilson's August 23, 2007 BLM-approved work plan.

SITE BACKGROUND

The RDM site is an abandoned cinnabar mine and mercury retorting site next to the Kuskokwim River, approximately 250 miles west of Anchorage. The RDM location is shown in Figure 1. BLM has been conducting cleanup of this site since the late 1980's. Five (5) groundwater monitoring wells have been installed at the site (see Photo 1, Attachment 1). Groundwater is being sampled annually to test for mercury, arsenic, lead, and antimony.

A former above-ground storage tank (AST), AST #5, was located as shown in Photo 2. There was a release of diesel fuel from AST #5. The site's ASTs were removed in 2003. In 2006, the soil beneath former AST #5 was excavated and stockpiled on site. Free hydrocarbon was observed on the surface of water that seeped into, and pooled within the excavation. The water infiltrating the excavation was believed to be from precipitation that had percolated to the sub-surface, following significant rainfall that had been occurring during the excavation activities. It could not be determined if groundwater had been impacted by the hydrocarbon contamination. Testing for hydrocarbon constituents was planned for 2007 to help evaluate

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907·561·2120 FAX 907·561·4483

potential impact to groundwater, downgradient of the former release location.

WATER SAMPLING

September 2007 water sampling activities consisted of collecting groundwater samples from the five on-site monitoring wells. Prior to the collection of the groundwater samples, the depth to groundwater and to the well bottom was measured, and the well volume calculated. At least three well volumes were removed from each well except for MW-7, which was purged dry. The wells were purged and sampled using dedicated disposable bailers. Purge water generated from the wells was discharged to the ground surface. Purging continued until the water quality parameters pH, electrical conductivity, and temperature stabilized within 10 percent over three consecutive measurements. Parameters were measured using a Hanna meter every 3 to 5 minutes. Water level measurements, purging information, and the final water quality parameter measurements are presented in Table 1.

LABORATORY ANALYSES

The seven water samples, including one field duplicate and one trip blank, were submitted to SGS Environmental Services Inc. (SGS) of Anchorage, Alaska using chain-of-custody procedures. A sample from each well was analyzed for antinomy (Sb), arsenic (As), lead (Pb), and mercury (Hg). Antimony, arsenic, and lead were analyzed by Environmental Protection Agency (EPA) Method 6020, and mercury was analyzed by EPA 7470A/E245.1.

Samples from two wells, MW-3 and MW-6, were also analyzed for GRO by Alaska Method (AK) 101; DRO by AK 102, RRO by AK 103; and BTEX by EPA 8021B. The 2007 sampling event was the first time these wells had been sampled for hydrocarbon analyses. The trip blank was tested for GRO and BTEX. A copy of the laboratory reports is included in Attachment 2, and the analytical results are summarized in Table 2.

DISCUSSION OF RESULTS

The reported contaminants in the water samples are compared to the cleanup levels listed in the Oil and Other Hazardous Substances Pollution Control Regulations of 18 AAC 75, Table C. This year's sampling results were also compared to historical data. Historical data are presented in Table 3.

Antimony concentrations exceed the cleanup levels in each of the five wells. Arsenic and

lead concentrations exceed cleanup levels in samples from each well except MW-4. The mercury cleanup level was exceeded only in the sample from well MW-6. There does not appear to be a trend in historical results either increasing or decreasing. There have also been significant historical fluctuations in concentrations of analytes.

Samples from wells MW-3 and MW-6 were tested for potential hydrocarbon impact for the first time in 2007. The groundwater samples from those wells did not contain detectable concentrations of GRO, DRO, and BTEX.

QUALITY ASSURANCE SUMMARY

The project laboratory follows on-going quality assurance/quality control procedures to meet applicable ADEC data quality objectives (DQO). Internal laboratory controls included surrogate spikes, method blanks, matrix spike/matrix spike duplicates (MS/MSD), and laboratory control sample/laboratory control sample duplicates (LCS/LCSD) to evaluate analytical precision and accuracy. If a DQO was not met, the project laboratory provides a brief narrative concerning the problem in the Case Narrative of their Laboratory Analysis Report (See Attachment 2). Shannon & Wilson reviewed the SGS data deliverables and completed the ADEC's Laboratory Data Review Checklist, which is included in Attachment 2.

The laboratory case narrative states that sample RDM22B from Monitoring Well MW-6, tested for BTEX and GRO, had a pH greater than 2. However, this did not affect the quality of the results.

External quality controls include field records, field duplicate sample, and a trip blank. Data validation was performed to assess the field records and analytical test results. Field logs and records were checked for completeness, accuracy, and adherence to field procedures established in ADEC's guidance documents. Discrepancies were not identified in the field records that would impact the data usability.

The analytical data evaluation included a review of laboratory results for one field duplicate set and one trip blank. Sample RDM55B, collected from Monitoring Well MW-3, was a field duplicate of Sample RDM33B. Neither sample contained detectable concentrations of GRO or BTEX; therefore, precision was not calculated for the parameters. GRO or BTEX were not detected in the trip blank, indicating that contamination of the sample containers or samples did not occur during transport or handling of the project samples.

Based on this quality assurance summary, we find the project data to be useable for the intended uses.

CONCLUSIONS

Antimony, arsenic, and lead were measured in concentrations exceeding ADEC cleanup levels. Mercury was of concern because of mercury retorting operations at the site; however, mercury concentrations exceed the cleanup level in only one well, MW-6.

The two wells tested for petroleum hydrocarbons, MW-3 and MW-6, did not contain detectable GRO or BTEX. We recommend continued monitoring for petroleum hydrocarbon constituents in well MW-3 only, because it is closest to the potential source (former AST), and eventual testing of groundwater closer to the former AST location. If groundwater has been impacted by hydrocarbon release, it is not likely to reach MW-6, because that well is across Red Devil Creek from the release site. Unless groundwater levels fall below the creek elevation and the creek runs dry, it is unlikely that impacted groundwater will be detected in MW-6.

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 within this report are based on the limited research, sampling, and analyses that we conducted at this site. They should not be construed as definite conclusions regarding the site's groundwater quality. As a result, the analysis and sampling 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 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 will not disclose the results of this study, except with your permission or as required by law.

Shannon & Wilson has prepared the information in Attachment 3 "Important Information About Your Geotechnical/Environmental Report" to assist you and others in understanding the use and limitations of our reports.

We appreciate the opportunity to perform these services. Please call Matthew Hemry, P.E. or the undersigned at (907) 561-2120 if you have questions regarding the contents of this report.

Sincerely,

SHANNON & WILSON, INC.

Nicholas E. Protos

Senior Environmental Engineer

Enc: Tables 1, 2, and 3
Figure 1
Attachments 1, 2, and 3

TABLE 1 - WELL SAMPLING LOG

WATER LEVEL MEASUREMENT DATA

PURGING DATA

Well Number	MW-1	MW-3	MW-4	MW-6	MW-7
Date Sampled	9/5/2007	9/5/2007	9/5/2007	9/5/2007	9/5/2007
Time Sampled	13:15	14:40	12:25	15:30	14:00
Measured Depth to Water (ft below MP)	19.87	20.68	26.78	18.63	20.42
Total Depth of Well (ft below MP)	29.71	27.79	33.58	26.1	23.61
Water Column in Well (ft)	9.84	7.11	6.80	7.47	3.19
Gallons per Foot	0.16	0.16	0.16	0.16	0.16
Water Column Volume (gallons)	1.57	1.14	1.09	1.20	0.51
Total Volume Pumped/Bailed (gallons)	4.5	4.00	4	5	0.75
Development Method	Bailer	Bailer	Bailer	Bailer	Bailer
Purging/Sampling Method	Bailer	Bailer	Bailer	Bailer	Bailer
Diameter of Well Casing	2-inch	2-inch	2-inch	2-inch	2-inch
Remarks					Purged Dry

WATER QUALITY DATA

WELL NUMBER	MW-1	MW-3	MW-4	MW-6	MW-7
Temperature (^{o}C)	4.5	4.9	4.9	3.6	9.5
Specific Conductance (µS/cm)	284	301	389	365	369
pH (Standard Units)	6.40	6.31	6.05	6.78	6.75

Note: Water quality parameters were measured with a Hanna Meter

KEY	DESCRIPTION
^{o}C	Degrees Celsius
ft	Feet
µS/cm	Microsiemens per Centimeter
MP	Measuring Point

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS

			Sample ID Number, Well Number, and Water Depth in Feet (See Table 1, Figure 1, and Attachment 2)						
			RDM1WM	RDM3WM RDM15B RDM33B	RDM55B†	RDM4WM	RDM5WM RDM13B RDM22B	RDM6WM	Trip Blank
			MW-1	MW-3	MW-3	MW-4	MW-6	MW-7	
Parameter Tested	**Method***	**Cleanup Level****	19.87	20.68	20.68	26.78	18.63	26.78	-
Metals									
Antimony - mg/L	EPA6020	0.006	**0.0156**	**0.819**	-	**0.0371**	**0.0968**	**0.0384**	-
Arsenic - mg/L	EPA6020	0.05	**0.0927**	**0.416**	-	0.0495	**0.354**	**0.237**	-
Lead - mg/L	EPA6020	0.015	**0.0191**	**0.0197**	-	0.00338	**0.0556**	**0.227**	-
Mercury - mg/L	EPA7470A/E245.1	0.002	<0.0002	0.000259	-	0.00125	**0.0436**	<0.0002	-
Gasoline Range Organics (GRO) - mg/L	AK 101	1.3	-	<0.1000	<0.1000	-	<0.1000	-	<0.1000
Diesel Range Organics (DRO) - mg/L	AK 102	1.5	-	<0.313	-	-	<0.3130	-	-
Residual Range Organics (RRO) - mg/L	AK 103	1.1	-	<0.521			<0.5210		
Aromatic Volatile Organics (BTEX)									
Benzene - mg/L	EPA 8021B	0.005	-	<0.0005	<0.0005	-	<0.0005	-	<0.0005
Toluene - mg/L	EPA 8021B	1.0	-	<0.0020	<0.0020	-	<0.0020	-	<0.0020
Ethylbenzene - mg/L	EPA 8021B	0.7	-	<0.0020	<0.0020	-	<0.0020	-	<0.0020
Xylenes - mg/L	EPA 8021B	10.0	-	<0.0020	<0.0020	-	<0.0020	-	<0.0020

KEY	DESCRIPTION
*	See Attachment 2 for compounds tested, methods, and laboratory reporting limits
**	Groundwater cleanup levels are listed in Table C, 18 AAC 75.345 (Decebmer 2006)
†	Sample is duplicate of preceding sample
<0.100	Analyte not detected; laboratory reporting limit of 0.100 mg/L
-	Not applicable or sample not tested for this analyte
mg/L	Milligrams per Liter
0.00635	Reported concentration exceeds the regulated cleanup level

TABLE 3 - HISTORICAL GROUNDWATER DATA

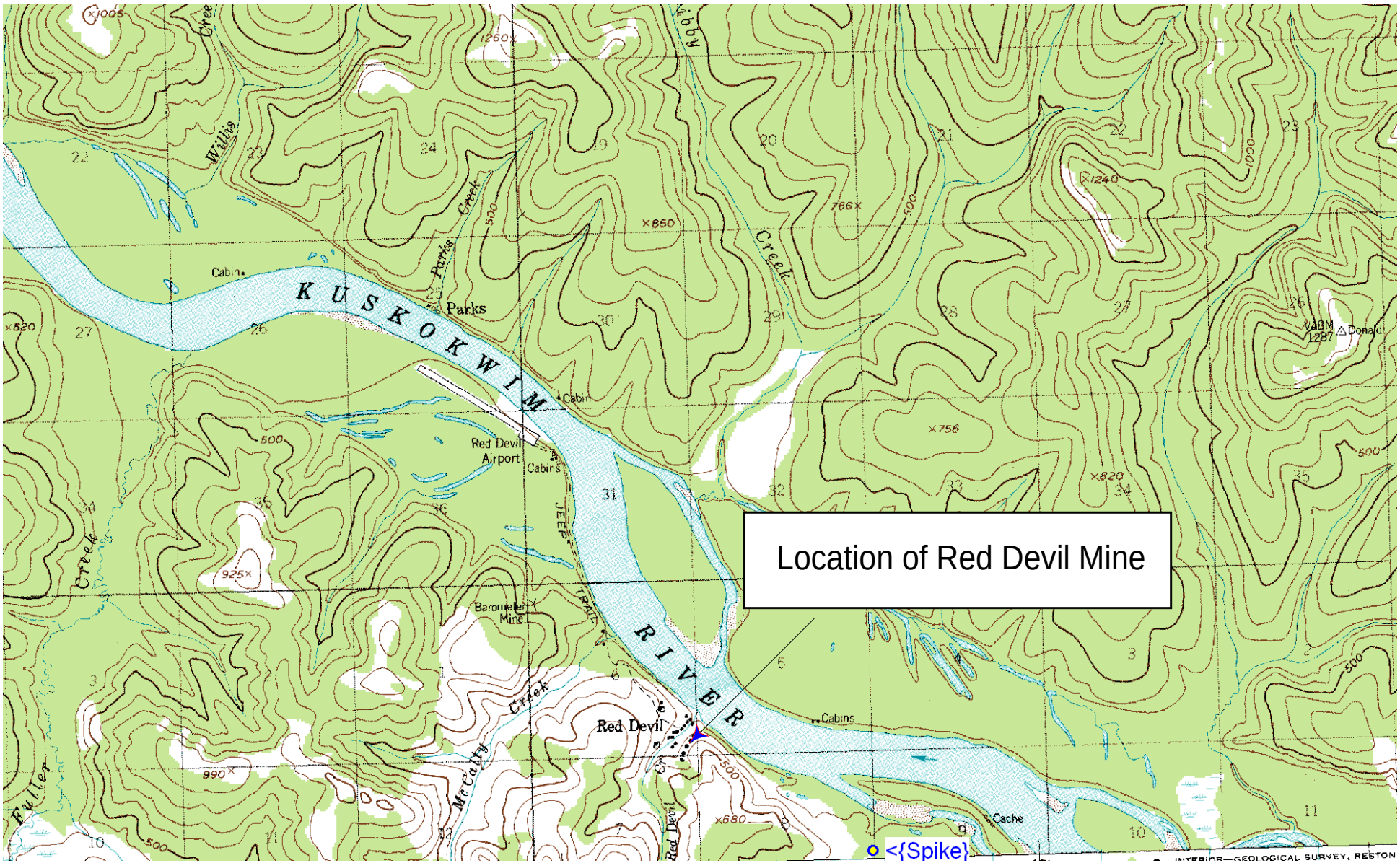
		Mercury	Arsenic	Antimony	Lead	GRO	BTEX	DRO	RRO
Monitoring Well	**Yr**	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
ADEC Cleanup Level		0.002	0.05	0.006	0.015	1.3	-	1.5	1.1
MW-1	2000	28.60	58.20	52.80	ND	-	-	-	-
	2003	ND	33.00	8.00	-	-	-	-	-
	2005	0.81	57.10	29.90	-	-	-	-	-
	2006	ND	150.00	40.30	-	-	-	-	-
	2007	ND	92.70	15.60	19.10	-	-	-	-
MW-3	2000	5.31	129.00	1010.00	ND	-	-	-	-
	2003	1.00	148.00	751.00	-	-	-	-	-
	2005	29.00	515.00	982.00	-	-	-	-	-
	2006	3.50	288.00	1250.00	-	-	-	-	-
	2007	0.26	416.00	819.00	19.70	ND	ND	ND	ND
MW-4	2000	0.83	52.30	90.30	ND	-	-	-	-
	2003	ND	20.90	43.50	-	-	-	-	-
	2005	ND	245.00	101.00	-	-	-	-	-
	2006	2.00	124.00	61.40	-	-	-	-	-
	2007	1.25	49.50	37.10	3.38	-	-	-	-
MW-6	2000	ND	25.40	103.00	ND	-	-	-	-
	2003	ND	36.00	15.00	-	-	-	-	-
	2005	49.60	446.00	250.00	-	-	-	-	-
	2006	2.38	512.00	150.00	-	-	-	-	-
	2007	43.60	354.00	96.80	55.60	ND	ND	ND	ND
MW-7	2000	5.48	114.00	ND	205.00	-	-	-	-
	2003	11.00	ND	ND	-	-	-	-	-
	2005	1.06	23.90	20.20	-	-	-	-	-
	2006	ND	310.00	2.84	-	-	-	-	-
	2007	ND	237.00	38.40	227.00	-	-	-	-

Notes:

MW-03 & 06 Sampled for GRO/BTEX/DRO/RRO for first time in 2007

Year **2000** is Baseline - Pre Monofill Construction

Key	**Description**
ND	Not detected above the laboratory reporting limit
(µg/L)	Micrograms per liter
-	Not applicable or sample not tested for this analyte



From USGS Quadrangle: Sleetmute (D-4), Alaska

Red Devil Mine	
VICINITY MAP	
December 2007	32-1-17124
SHANNON & WILSON, INC. Geotechnical & Environmental Consultants	**Fig. 1**

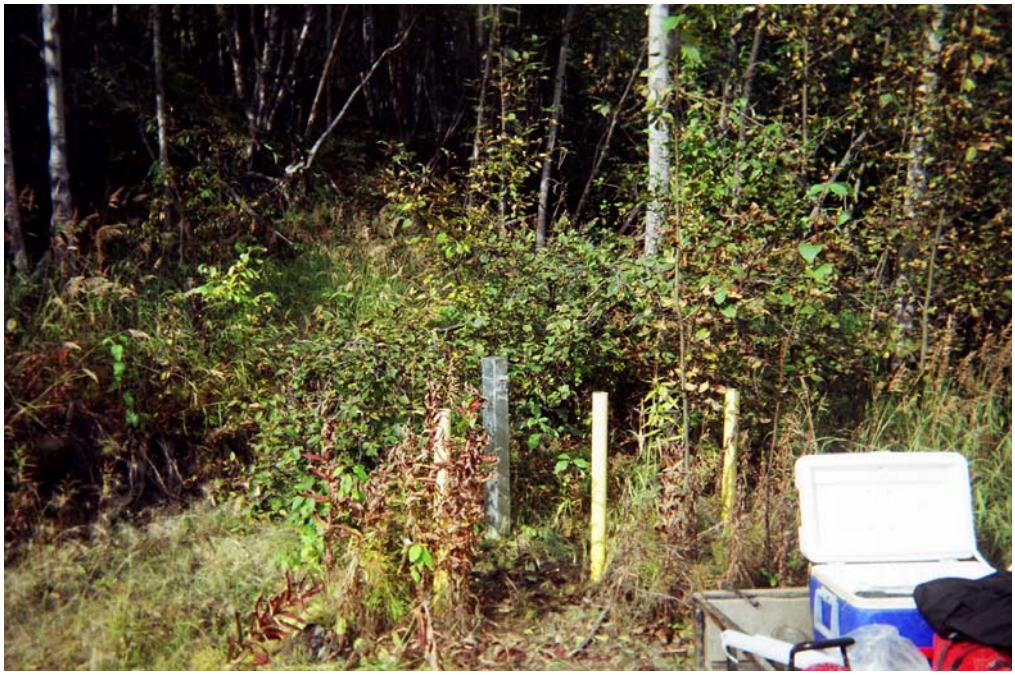
ATTACHMENT 1

SITE PHOTOGRAPHS

Photograph 1. Aerial view of site looking south, showing locations of monitoring wells. Photograph provided by BLM.

Photograph 2. Former AST and hydrocarbon release location shown in center of photo. Facing south. Photograph provided by BLM.

Photograph 3. Monitoring Well MW-4. View is to the northeast.



Photograph 4. Monitoring Well MW-6. View is to the west.

ATTACHMENT 2

RESULTS OF ANALYTICAL TESTING BY
SGS ENVIRONMENTAL SERVICES
OF ANCHORAGE, ALASKA

AND

ADEC LABORATORY DATA REVIEW CHECKLIST

SGS Environmental Services
Alaska Division
Level II Laboratory Data Report

Project:	RDM
Client:	Shannon & Wilson Inc.
SGS Work Order:	1074592

Released by:

Contents:

Note:
Unless otherwise noted, all quality assurance/quality control criteria is in compliance with the standards set forth by the proper regulatory authority, the SGS Quality Assurance Program Plan, and the National Environmental Accreditation Conference.

Case Narrative

Client	SHANNOT	Shannon & Wilson Inc.	**Printed Date/Time**	9/20/2007	9:04
Workorder	1074592	RDM			

Sample ID	Client Sample ID

Refer to the sample receipt form for information on sample condition.

1074592008 **PS** **RDM 22 B**

8021B - Sample has a pH greater than two.

790860 **MS** **07KS3ZSWPD-115WG(1074718002MS**

6020 -MS/MSD recoveries for Sb, As, Ba, Cd, Cr, Fe, and Pb were outside of acceptance criteria. Post digestion spike was successful.

790861 **MSD** **07KS3ZSWPD-1...(1074718002MSD**

6020 -MS/MSD recoveries for Sb, As, Ba, Cd, Cr, Fe, and Pb were outside of acceptance criteria. Post digestion spike was successful.

Laboratory Analysis Report

200 W. Potter Drive
Anchorage, AK 99518-1605
Tel: (907) 562-2343
Fax: (907) 561-5301
Web: http://www.us.sgs.com

Nick Protos
Shannon & Wilson Inc.
5430 Fairbanks Street
Suite 3
Anchorage, AK 99518

Work Order:	1074592	
	RDM	**Released by:**
Client:	Shannon & Wilson Inc.	
Report Date:	September 20, 2007	

Enclosed are the analytical results associated with the above workorder.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintained by SGS. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request.

The laboratory certification numbers are AK971-05 (DW), UST-005 (CS) and AK00971 (Micro) for ADEC and 001828 for NELAP (RCRA methods: 1010/1020, 1311, 6000/7000, 9040/9045, 9056, 9060, 9065, 8015B, 8021B, 8081A/8082, 8260B, 8270C).

Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP, the National Environmental Laboratory Accreditation Program and, when applicable, other regulatory authorities.

If you have any questions regarding this report or if we can be of any other assistance, please contact your SGS Project Manager at 907-562-2343.

The following descriptors may be found on your report which will serve to further qualify the data.

PQL	Practical Quantitation Limit (reporting limit).
U	Indicates the analyte was analyzed for but not detected.
F	Indicates value that is greater than or equal to the MDL.
J	The quantitation is an estimation.
ND	Indicates the analyte is not detected.
B	Indicates the analyte is found in a blank associated with the sample.
*	The analyte has exceeded allowable regulatory or control limits.
GT	Greater Than
D	The analyte concentration is the result of a dilution.
LT	Less Than
!	Surrogate out of control limits.
Q	QC parameter out of acceptance range.
M	A matrix effect was present.
JL	The analyte was positively identified, but the quantitation is a low estimation.
E	The analyte result is above the calibrated range.

Note: Soil samples are reported on a dry weight basis unless otherwise specified.

SGS

SGS Ref.#	1074592001
Client Name	Shannon & Wilson Inc.
Project Name/#	RDM
Client Sample ID	RDM 1 WM
Matrix	Water (Surface, Eff., Ground)

All Dates/Times are Alaska Standard Time

Printed Date/Time	09/20/2007 9:04
Collected Date/Time	09/05/2007 13:45
Received Date/Time	09/06/2007 8:30
Technical Director	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Metals Department									
Mercury	ND	0.200	ug/L	SW7470A/E245.1	A		09/19/07	09/19/07	AFH
Metals by ICP/MS									
Antimony	15.6	1.00	ug/L	SW6020	A		09/14/07	09/17/07	TK
Arsenic	92.7	10.0	ug/L	SW6020	A		09/14/07	09/17/07	TK
Lead	19.1	1.00	ug/L	SW6020	A		09/14/07	09/17/07	TK

SGS

SGS Ref.#	1074592002
Client Name	Shannon & Wilson Inc.
Project Name/#	RDM
Client Sample ID	RDM 3 WM
Matrix	Water (Surface, Eff., Ground)

All Dates/Times are Alaska Standard Time

Printed Date/Time	09/20/2007 9:04
Collected Date/Time	09/05/2007 15:07
Received Date/Time	09/06/2007 8:30
Technical Director	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Metals Department									
Mercury	0.259	0.200	ug/L	SW7470A/E245.1	A		09/19/07	09/19/07	AFH
Metals by ICP/MS									
Antimony	819	1.00	ug/L	SW6020	A		09/14/07	09/17/07	TK
Arsenic	416	10.0	ug/L	SW6020	A		09/14/07	09/17/07	TK
Lead	19.7	1.00	ug/L	SW6020	A		09/14/07	09/17/07	TK

SGS Ref.#	1074592003	**All Dates/Times are Alaska Standard Time**	
Client Name	Shannon & Wilson Inc.	**Printed Date/Time**	09/20/2007 9:04
Project Name/#	RDM	**Collected Date/Time**	09/05/2007 13:03
Client Sample ID	RDM 4 WM	**Received Date/Time**	09/06/2007 8:30
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Metals Department									
Mercury	1.25	0.200	ug/L	SW7470A/E245.1	A		09/19/07	09/19/07	AFH
Metals by ICP/MS									
Antimony	37.1	1.00	ug/L	SW6020	A		09/14/07	09/17/07	TK
Arsenic	49.5	10.0	ug/L	SW6020	A		09/14/07	09/17/07	TK
Lead	3.38	1.00	ug/L	SW6020	A		09/14/07	09/17/07	TK

SGS

SGS Ref.#	1074592004
Client Name	Shannon & Wilson Inc.
Project Name/#	RDM
Client Sample ID	RDM 5 WM
Matrix	Water (Surface, Eff., Ground)

All Dates/Times are Alaska Standard Time

Printed Date/Time	09/20/2007 9:04
Collected Date/Time	09/05/2007 16:00
Received Date/Time	09/06/2007 8:30
Technical Director	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Metals Department									
Mercury	43.6	0.800	ug/L	SW7470A/E245.1	A		09/19/07	09/19/07	AFH
Metals by ICP/MS									
Antimony	96.8	1.00	ug/L	SW6020	A		09/14/07	09/17/07	TK
Arsenic	354	10.0	ug/L	SW6020	A		09/14/07	09/17/07	TK
Lead	55.6	1.00	ug/L	SW6020	A		09/14/07	09/17/07	TK

SGS Ref.#	1074592005	**All Dates/Times are Alaska Standard Time**	
Client Name	Shannon & Wilson Inc.	**Printed Date/Time**	09/20/2007 9:04
Project Name/#	RDM	**Collected Date/Time**	09/05/2007 14:14
Client Sample ID	RDM 6 WM	**Received Date/Time**	09/06/2007 8:30
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Metals Department									
Mercury	ND	0.200	ug/L	SW7470A/E245.1	A		09/19/07	09/19/07	AFH
Metals by ICP/MS									
Antimony	38.4	1.00	ug/L	SW6020	A		09/14/07	09/17/07	TK
Arsenic	237	10.0	ug/L	SW6020	A		09/14/07	09/17/07	TK
Lead	227	1.00	ug/L	SW6020	A		09/14/07	09/17/07	TK

SGS Ref.#	1074592006	**All Dates/Times are Alaska Standard Time**	
Client Name	Shannon & Wilson Inc.	**Printed Date/Time**	09/20/2007 9:04
Project Name/#	RDM	**Collected Date/Time**	09/05/2007 15:50
Client Sample ID	RDM 15 B	**Received Date/Time**	09/06/2007 8:30
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Semivolatile Organic Fuels Department									
Diesel Range Organics	ND	0.313	mg/L	AK102	A		09/15/07	09/18/07	HKG
Residual Range Organics	ND	0.521	mg/L	AK103	A		09/15/07	09/18/07	HKG
Surrogates									
5a Androstane <surr>	87.8		%	AK102	A	50-150	09/15/07	09/18/07	HKG
n-Triacontane-d62 <surr>	101		%	AK103	A	50-150	09/15/07	09/18/07	HKG

SGS Ref.#	1074592007
Client Name	Shannon & Wilson Inc.
Project Name/#	RDM
Client Sample ID	RDM 13 B
Matrix	Water (Surface, Eff., Ground)

All Dates/Times are Alaska Standard Time

Printed Date/Time	09/20/2007 9:04
Collected Date/Time	09/05/2007 15:08
Received Date/Time	09/06/2007 8:30
Technical Director	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Semivolatile Organic Fuels Department									
Diesel Range Organics	ND	0.313	mg/L	AK102	A		09/15/07	09/18/07	HKG
Residual Range Organics	ND	0.521	mg/L	AK103	A		09/15/07	09/18/07	HKG
Surrogates									
5a Androstane <surr>	86.1		%	AK102	A	50-150	09/15/07	09/18/07	HKG
n-Triacontane-d62 <surr>	90.3		%	AK103	A	50-150	09/15/07	09/18/07	HKG

SGS

SGS Ref.#	1074592008
Client Name	Shannon & Wilson Inc.
Project Name/#	RDM
Client Sample ID	RDM 22 B
Matrix	Water (Surface, Eff., Ground)

All Dates/Times are Alaska Standard Time

Printed Date/Time	09/20/2007 9:04
Collected Date/Time	09/05/2007 16:44
Received Date/Time	09/06/2007 8:30
Technical Director	**Stephen C. Ede**

Sample Remarks:

8021B - Sample has a pH greater than two.

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Gasoline Range Organics	ND	0.100	mg/L	AK101	A		09/08/07	09/08/07	KAR
Benzene	ND	0.500	ug/L	SW8021B	B		09/09/07	09/09/07	NHN
Toluene	ND	2.00	ug/L	SW8021B	B		09/09/07	09/09/07	NHN
Ethylbenzene	ND	2.00	ug/L	SW8021B	B		09/09/07	09/09/07	NHN
P & M -Xylene	ND	2.00	ug/L	SW8021B	B		09/09/07	09/09/07	NHN
o-Xylene	ND	2.00	ug/L	SW8021B	B		09/09/07	09/09/07	NHN
Surrogates									
4-Bromofluorobenzene <surr>	88		%	AK101	A	50-150	09/08/07	09/08/07	KAR
1,4-Difluorobenzene <surr>	87.9		%	SW8021B	B	80-120	09/09/07	09/09/07	NHN

SGS

SGS Ref.#	1074592009
Client Name	Shannon & Wilson Inc.
Project Name/#	RDM
Client Sample ID	RDM 33 B
Matrix	Water (Surface, Eff., Ground)

All Dates/Times are Alaska Standard Time

Printed Date/Time	09/20/2007 9:04
Collected Date/Time	09/05/2007 16:23
Received Date/Time	09/06/2007 8:30
Technical Director	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Gasoline Range Organics	ND	0.100	mg/L	AK101	A		09/08/07	09/08/07	KAR
Benzene	ND	0.500	ug/L	SW8021B	B		09/09/07	09/09/07	NHN
Toluene	ND	2.00	ug/L	SW8021B	B		09/09/07	09/09/07	NHN
Ethylbenzene	ND	2.00	ug/L	SW8021B	B		09/09/07	09/09/07	NHN
P & M -Xylene	ND	2.00	ug/L	SW8021B	B		09/09/07	09/09/07	NHN
o-Xylene	ND	2.00	ug/L	SW8021B	B		09/09/07	09/09/07	NHN
Surrogates									
4-Bromofluorobenzene <surr>	65.1		%	AK101	A	50-150	09/08/07	09/08/07	KAR
1,4-Difluorobenzene <surr>	87.8		%	SW8021B	B	80-120	09/09/07	09/09/07	NHN

SGS

SGS Ref.#	1074592010
Client Name	Shannon & Wilson Inc.
Project Name/#	RDM
Client Sample ID	RDM 55 B
Matrix	Water (Surface, Eff., Ground)

All Dates/Times are Alaska Standard Time

Printed Date/Time	09/20/2007 9:04
Collected Date/Time	09/05/2007 16:24
Received Date/Time	09/06/2007 8:30
Technical Director	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Gasoline Range Organics	ND	0.100	mg/L	AK101	A		09/08/07	09/08/07	KAR
Benzene	ND	0.500	ug/L	SW8021B	B		09/09/07	09/09/07	NHN
Toluene	ND	2.00	ug/L	SW8021B	B		09/09/07	09/09/07	NHN
Ethylbenzene	ND	2.00	ug/L	SW8021B	B		09/09/07	09/09/07	NHN
P & M -Xylene	ND	2.00	ug/L	SW8021B	B		09/09/07	09/09/07	NHN
o-Xylene	ND	2.00	ug/L	SW8021B	B		09/09/07	09/09/07	NHN
Surrogates									
4-Bromofluorobenzene <surr>	94.8		%	AK101	A	50-150	09/08/07	09/08/07	KAR
1,4-Difluorobenzene <surr>	87.8		%	SW8021B	B	80-120	09/09/07	09/09/07	NHN

SGS

SGS Ref.#	1074592011
Client Name	Shannon & Wilson Inc.
Project Name/#	RDM
Client Sample ID	Trip Blank
Matrix	Water (Surface, Eff., Ground)

All Dates/Times are Alaska Standard Time

Printed Date/Time	09/20/2007 9:04
Collected Date/Time	09/05/2007 16:24
Received Date/Time	09/06/2007 8:30
Technical Director	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Gasoline Range Organics	ND	0.100	mg/L	AK101	A		09/08/07	09/08/07	KAR
Benzene	ND	0.500	ug/L	SW8021B	A		09/09/07	09/09/07	NHN
Toluene	ND	2.00	ug/L	SW8021B	A		09/09/07	09/09/07	NHN
Ethylbenzene	ND	2.00	ug/L	SW8021B	A		09/09/07	09/09/07	NHN
P & M -Xylene	ND	2.00	ug/L	SW8021B	A		09/09/07	09/09/07	NHN
o-Xylene	ND	2.00	ug/L	SW8021B	A		09/09/07	09/09/07	NHN
Surrogates									
4-Bromofluorobenzene <surr>	60.4		%	AK101	A	50-150	09/08/07	09/08/07	KAR
1,4-Difluorobenzene <surr>	88.2		%	SW8021B	A	80-120	09/09/07	09/09/07	NHN

SGS Ref.#	789119	Method Blank	**Printed Date/Time**	09/20/2007	9:04
Client Name	Shannon & Wilson Inc.		**Prep Batch**	VXX17264	
Project Name/#	RDM		**Method**	SW5030B	
Matrix	Water (Surface, Eff., Ground)		**Date**	09/08/2007	

QC results affect the following production samples:

1074592008, 1074592009, 1074592010, 1074592011

Parameter	Results	Reporting/Control Limit	MDL	Units	Analysis Date
Volatile Fuels Department					
Gasoline Range Organics	ND	0.100	0.0100	mg/L	09/08/07
Surrogates					
4-Bromofluorobenzene <surr>	101	50-150		%	09/08/07

Batch VFC8590
Method AK101
Instrument HP 5890 Series II PID+FID VCA

SGS Ref.#	789251 Method Blank	**Printed Date/Time**		09/20/2007 9:04
Client Name	Shannon & Wilson Inc.	**Prep**	**Batch**	VXX17268
Project Name/#	RDM		**Method**	SW5030B
Matrix	Water (Surface, Eff., Ground)		**Date**	09/09/2007

QC results affect the following production samples:

1074592008, 1074592009, 1074592010, 1074592011

Parameter	Results	Reporting/Control Limit	MDL	Units	Analysis Date
Volatile Fuels Department					
Benzene	ND	0.500	0.150	ug/L	09/09/07
Toluene	ND	2.00	0.620	ug/L	09/09/07
Ethylbenzene	ND	2.00	0.620	ug/L	09/09/07
P & M -Xylene	ND	2.00	0.620	ug/L	09/09/07
o-Xylene	ND	2.00	0.620	ug/L	09/09/07
Surrogates					
1,4-Difluorobenzene <surr>	87.8	80-120		%	09/09/07

Batch VFC8593
Method SW8021B
Instrument HP 5890 Series II PID+FID VCA

SGS Ref.#	790858 Method Blank	**Printed Date/Time**		09/20/2007 9:04
Client Name	Shannon & Wilson Inc.	**Prep**	**Batch**	MXX19491
Project Name/#	RDM		**Method**	SW3010A
Matrix	Water (Surface, Eff., Ground)		**Date**	09/14/2007

QC results affect the following production samples:

1074592001, 1074592002, 1074592003, 1074592004, 1074592005

Parameter	Results	Reporting/Control Limit	MDL	Units	Analysis Date
Metals by ICP/MS					
Antimony	ND	1.00	0.310	ug/L	09/17/07
Arsenic	ND	10.0	5.00	ug/L	09/17/07
Lead	ND	1.00	0.310	ug/L	09/17/07

Batch MMS5085
Method SW6020
Instrument Perkin Elmer Sciex ICP-MS P3

SGS Ref.#	790936 Method Blank	**Printed Date/Time**	09/20/2007 9:04	
Client Name	Shannon & Wilson Inc.	**Prep**	**Batch**	XXX18576
Project Name/#	RDM		**Method**	SW3520C
Matrix	Water (Surface, Eff., Ground)		**Date**	09/15/2007

QC results affect the following production samples:

1074592006, 1074592007

Parameter	Results	Reporting/Control Limit	MDL	Units	Analysis Date
Semivolatile Organic Fuels Department					
Diesel Range Organics	ND	0.300	0.0600	mg/L	09/18/07
Surrogates					
5a Androstane <surr>	92	60-120		%	09/18/07
Batch XFC7592					
Method AK102					
Instrument HP 5890 Series II FID SV D F					
Residual Range Organics	0.163 J	0.500	0.100	mg/L	09/18/07
Surrogates					
n-Triacontane-d62 <surr>	107	60-120		%	09/18/07
Batch XFC7592					
Method AK103					
Instrument HP 5890 Series II FID SV D F					

SGS Ref.#	792211	Method Blank	**Printed Date/Time**	09/20/2007 9:04
Client Name	Shannon & Wilson Inc.		**Prep Batch**	MXX19516
Project Name/#	RDM		**Method**	METHOD
Matrix	Water (Surface, Eff., Ground)		**Date**	09/19/2007

QC results affect the following production samples:

1074592001, 1074592002, 1074592003, 1074592004, 1074592005

Parameter	Results	Reporting/Control Limit	MDL	Units	Analysis Date
Metals Department					
Mercury	ND	0.200	0.0620	ug/L	09/19/07
Batch MCV3719					
Method SW7470A/E245.1					
Instrument PSA Millennium mercury AA					

SGS Ref.#	789120	Lab Control Sample	**Printed Date/Time**	09/20/2007	9:04
	789121	Lab Control Sample Duplicate	**Prep Batch**	VXX17264	
Client Name	Shannon & Wilson Inc.		**Method**	SW5030B	
Project Name/#	RDM		**Date**	09/08/2007	
Matrix	Water (Surface, Eff., Ground)				

QC results affect the following production samples:

1074592008, 1074592009, 1074592010, 1074592011

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Volatile Fuels Department								
Gasoline Range Organics	LCS	0.173	87	(60-120)			0.200 mg/L	09/08/2007
	LCSD	0.172	77		1	(< 20)	0.225 mg/L	09/08/2007
Surrogates								
4-Bromofluorobenzene <surr>	LCS		97	(50-150)				09/08/2007
	LCSD		98		1			09/08/2007

Batch VFC8590
Method AK101
Instrument HP 5890 Series II PID+FID VCA

SGS

SGS Ref.#	789252	Lab Control Sample	**Printed Date/Time**	09/20/2007	9:04
	789253	Lab Control Sample Duplicate	**Prep Batch**	VXX17268	
Client Name	Shannon & Wilson Inc.		**Method**	SW5030B	
Project Name/#	RDM		**Date**	09/09/2007	
Matrix	Water (Surface, Eff., Ground)				

QC results affect the following production samples:

1074592008, 1074592009, 1074592010, 1074592011

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Volatile Fuels Department								
Benzene	LCS	111	111	(80-120)			100 ug/L	09/09/2007
	LCSD	104	104		6	(< 20)	100 ug/L	09/09/2007
Toluene	LCS	108	108	(80-120)			100 ug/L	09/09/2007
	LCSD	104	104		4	(< 20)	100 ug/L	09/09/2007
Ethylbenzene	LCS	109	109	(87-125)			100 ug/L	09/09/2007
	LCSD	104	104		4	(< 20)	100 ug/L	09/09/2007
P & M -Xylene	LCS	214	107	(87-125)			200 ug/L	09/09/2007
	LCSD	206	103		4	(< 20)	200 ug/L	09/09/2007
o-Xylene	LCS	107	107	(85-120)			100 ug/L	09/09/2007
	LCSD	103	103		4	(< 20)	100 ug/L	09/09/2007
Surrogates								
1,4-Difluorobenzene <surr>	LCS		90	(80-120)				09/09/2007
	LCSD		90		1			09/09/2007

Batch	VFC8593
Method	SW8021B
Instrument	HP 5890 Series II PID+FID VCA

SGS

SGS Ref.#	790859	Lab Control Sample	**Printed Date/Time**	09/20/2007	9:04
			Prep Batch	MXX19491	
Client Name	Shannon & Wilson Inc.		**Method**	SW3010A	
Project Name/#	RDM		**Date**	09/14/2007	
Matrix	Water (Surface, Eff., Ground)				

QC results affect the following production samples:

1074592001, 1074592002, 1074592003, 1074592004, 1074592005

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Metals by ICP/MS								
Antimony	LCS	1040	104	(80-120)			1000 ug/L	09/17/2007
Arsenic	LCS	1060	106	(80-120)			1000 ug/L	09/17/2007
Lead	LCS	970	97	(80-120)			1000 ug/L	09/17/2007

Batch MMS5085
Method SW6020
Instrument Perkin Elmer Sciex ICP-MS P3

SGS Ref.#	790937	Lab Control Sample	**Printed Date/Time**	09/20/2007	9:04
	790938	Lab Control Sample Duplicate	**Prep Batch**	XXX18576	
Client Name	Shannon & Wilson Inc.		**Method**	SW3520C	
Project Name/#	RDM		**Date**	09/15/2007	
Matrix	Water (Surface, Eff., Ground)				

QC results affect the following production samples:

1074592006, 1074592007

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Semivolatile Organic Fuels Department								
Diesel Range Organics	LCS	0.878	88	(75-125)			1 mg/L	09/18/2007
	LCSD	1.06	106		19	(< 20)	1 mg/L	09/18/2007
Surrogates								
5a Androstane <surr>	LCS		81	(60-120)				09/18/2007
	LCSD		98		19			09/18/2007

Batch XFC7593
Method AK102
Instrument HP 5890 Series II FID SV D F

Residual Range Organics	LCS	0.976	98	(60-120)			1 mg/L	09/18/2007
	LCSD	1.16	116		18	(< 20)	1 mg/L	09/18/2007
Surrogates								
n-Triacontane-d62 <surr>	LCS		84	(60-120)				09/18/2007
	LCSD		102		20			09/18/2007

Batch XFC7593
Method AK103
Instrument HP 5890 Series II FID SV D F

SGS

SGS Ref.#	792212	Lab Control Sample	**Printed Date/Time**	09/20/2007	9:04
			Prep Batch	MXX19516	
Client Name	Shannon & Wilson Inc.		**Method**	METHOD	
Project Name/#	RDM		**Date**	09/19/2007	
Matrix	Water (Surface, Eff., Ground)				

QC results affect the following production samples:

1074592001, 1074592002, 1074592003, 1074592004, 1074592005

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Metals Department								
Mercury	LCS	4.15	104	(85-115)			4 ug/L	09/19/2007

Batch MCV3719
Method SW7470A/E245.1
Instrument PSA Millennium mercury AA

SGS

SGS Ref.#	790860	Matrix Spike	**Printed Date/Time**		09/20/2007 9:04
	790861	Matrix Spike Duplicate	**Prep**	**Batch**	MXX19491
				Method	3010 H20 Digest for Metals ICI
				Date	09/14/2007
Original	1074718002				
Matrix	Water (Surface, Eff., Ground)				

QC results affect the following production samples:

1074592001, 1074592002, 1074592003, 1074592004, 1074592005

Parameter	Qualifiers		Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
Metals by ICP/MS											
Arsenic		MS	ND	732	73*	(80-120)			1000	ug/L	09/17/2007
		MSD		718	72*		2	(< 15)	1000	ug/L	09/17/2007
Lead		MS	ND	699	70*	(80-120)			1000	ug/L	09/17/2007
		MSD		690	69*		1	(< 15)	1000	ug/L	09/17/2007

Batch MMS5085
Method SW6020
Instrument Perkin Elmer Sciex ICP-MS P3

SGS

SGS Ref.#	790862	Bench Spike DIGESTED	**Printed Date/Time**		09/20/2007 9:04
			Prep	**Batch**	MXX19491
				Method	3010 H20 Digest for Metals ICI
				Date	09/14/2007
Original	1074718002				
Matrix	Water (Surface, Eff., Ground)				

QC results affect the following production samples:

1074592001, 1074592002, 1074592003, 1074592004, 1074592005

Parameter	Qualifiers	Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
Metals by ICP/MS										
Arsenic	BND	ND	4650	93	(75-125)			5000	ug/L	09/17/2007
Lead	BND	ND	4280	86	(75-125)			5000	ug/L	09/17/2007

Batch MMS5085
Method SW6020
Instrument Perkin Elmer Sciex ICP-MS P3

SGS Ref.#	792213	Matrix Spike	**Printed Date/Time**	09/20/2007 9:04
	792214	Matrix Spike Duplicate	**Prep Batch**	MXX19516
			Method	Digestion Mercury (W)
			Date	09/19/2007
Original	1074576001			
Matrix	Water (Surface, Eff., Ground)			

QC results affect the following production samples:

1074592001, 1074592002, 1074592003, 1074592004, 1074592005

Parameter	Qualifiers	Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Metals Department									
Mercury	MS	ND	8.23	103	(85-115)			8 ug/L	09/19/2007
	MSD		8.13	102		1	(< 15)	8 ug/L	09/19/2007

Batch MCV3719
Method SW7470A/E245.1
Instrument PSA Millennium mercury AA

SGS Ref.#	792219	Matrix Spike	**Printed Date/Time**	09/20/2007 9:04
	792220	Matrix Spike Duplicate	**Prep Batch**	MXX19516
			Method	Digestion Mercury (W)
			Date	09/19/2007

Original 1074592003
Matrix Water (Surface, Eff., Ground)

QC results affect the following production samples:
1074592001, 1074592002, 1074592003, 1074592004, 1074592005

Parameter	Qualifiers		Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
Metals Department											
Mercury		MS	1.25	8.54	91	(85-115)			8	ug/L	09/19/2007
		MSD		9.81	107		14	(< 15)	8	ug/L	09/19/2007

Batch MCV3719
Method SW7470A/E245.1
Instrument PSA Millennium mercury AA

SGS Ref.#	792223	Matrix Spike	**Printed Date/Time**	09/20/2007 9:04
	792224	Matrix Spike Duplicate	**Prep Batch**	MXX19516
			Method	Digestion Mercury (W)
			Date	09/19/2007

Original 1074547001
Matrix Other Solids (Wet Weight)

QC results affect the following production samples:
1074592001, 1074592002, 1074592003, 1074592004, 1074592005

Parameter	Qualifiers		Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
Metals Department											
Mercury		MS	ND	78.9	99	(85-115)			80	ug/L	09/19/2007
		MSD		82.4	103		4	(< 15)	80	ug/L	09/19/2007

Batch MCV3719
Method SW7470A/E245.1
Instrument PSA Millennium mercury AA

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Locations Nationwide
- Alaska
- Hawaii
- Ohio
- Maryland
- New Jersey
- North Carolina
- West Virginia

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071507

(1)

CLIENT: SHANNON + WILSON
CONTACT: NICK PROTOS PHONE NO:(907) 561-2120
PROJECT: RDM SITE/PWSID# :
REPORTS TO: E-MAIL: [redacted] nep@shanwil.com
NICK PROTOS FAX NO.:( )
INVOICE TO: QUOTE #
SHANNON + WILSON P.O. NUMBER 32-1-17124

SGS Reference:

PAGE 1 OF 2

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE C=COMP G=GRAB	Preservatives Used: HNO3 HCl	Analysis Required (3): METALS: 5b, As, Pb, Hg; RRD AK101; DRO - AK102	REMARKS
(1) A	RDM 1 WM	9/5/07	13:05	W	1	G	✓	✓	EPA 6020 / 7470 FOR METALS
	~~RDM 2 WM~~				~~1~~		~~✓~~		
(2) A	RDM 3 WM		15:07		1		✓	✓	
(3)	RDM 4 WM		13:03		1		✓	✓	
(4)	RDM 5 WM		16:00		1		✓	✓	
(5)	RDM 6 WM		14:14		1		✓	✓	
(6) A, B	RDM 12B		15:50		2			✓	
(7) A, B	RDM 13B		15:08		2			✓	
	~~RDM 15B~~				~~2~~			~~✓~~	
	~~RDM 17B~~				~~2~~			~~✓~~	

(5)

Collected/Relinquished By:(1)	Date	Time	Received By:	Date	Time
NICHOLAS E PROTOS	9/6/07	8:53			
Relinquished By: (2)	Date	Time	Received By:	Date	Time
Relinquished By: (3)	Date	Time	Received By:	Date	Time
Relinquished By: (4)	Date	Time	Received By:	Date	Time
				9/6/07	0830

(4)

Shipping Carrier:
Shipping Ticket No:
Samples Received Cold? (Circle) YES NO
Temperature IC: TB = 3.3 C = 4.1 T
Special Deliverable Requirements:
Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT
Special Instructions:
Requested Turnaround Time: ☐ RUSH _____ Date Needed ☐ STD

SGS

CHAIN OF CUSTODY
SGS Environmental Se

1074592

Locations Nationwide
Alaska • Hawaii
Ohio • Maryland
New Jersey • North Carolina
West Virginia
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071508

(1)

CLIENT: SHANNON + WILSON
CONTACT: NICK PROTOS PHONE NO:(907) 561-2120
PROJECT: RDM SITE/PWSID# :
REPORTS TO: E-MAIL: nep@shannwil.com
NICK PROTOS FAX NO.:( )
INVOICE TO: QUOTE #
SHANNON + WILSON P.O. NUMBER 324-17124

SGS Reference:

PAGE 2 OF 2

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C=COMP G=GRAB)	Preservatives Used: HCl	Analysis Required (3): NWTPH-Dx/8021B GRO/BTEX	REMARKS
(8) A-C	RDM 22B	9/5/07	16:44	W	3	G	✓	✓	
(9)	RDM 33B	"	16:23	"	3	"	✓	✓	
(10)	RDM 55B	"	16:24	"	3	"	✓	✓	
	~~RDM 77B~~	"		"	3	"	✓	✓	
(11) A-C									

(5)

Collected/Relinquished By: (1)	Date	Time	Received By:	Date	Time
NICHOLAS E. PROTOS	9/6/07	5:33			
Relinquished By: (2)	Date	Time	Received By:	Date	Time
Relinquished By: (3)	Date	Time	Received By:	Date	Time
Relinquished By: (4)	Date	Time	Received By:	Date	Time
				9/6/07	0830

(4)

Shipping Carrier:
Shipping Ticket No:
Samples Received Cold? (Circle) YES NO
Temperature [C: TB= 3.3 C= 4.1]
Special Deliverable Requirements:
Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT
Special Instructions:
Requested Turnaround Time:
☐ RUSH _____ Date Needed ☐ STD

1074592

SGS

SAMPLE RECEIPT FORM

SGS WO#:

Yes	No	NA		
___	✓	___	Are samples **RUSH**, priority, or *w/n 72 hrs.* of **hold time**?	**Due Date:** 9/19/07
___	___	✓	If yes have you done *e-mail notification*?	**Received Date:** 9/6/07
___	✓	___	Are samples *within 24 hrs.* of **hold time** or **due date**?	**Received Time:** 0830
___	___	✓	If yes, have you *spoken with* Supervisor?	Is **date/time conversion** necessary? NO
___	✓	___	Archiving bottles – if req., are they properly marked?	# of hours to AK Local Time: ___
___	___	✓	Are there any **problems**? PM Notified? ___	**Thermometer ID:** ~~IR~~ 70D
___	___	✓	Were samples preserved correctly and pH verified?	

Cooler ID	Temp Blank	Cooler Temp
1	3.3 °C	4.1 °C
___	___ °C	___ °C
___	___ °C	___ °C
___	___ °C	___ °C
___	___ °C	___ °C

*Temperature readings include thermometer correction factors

___	✓	___	If this is for PWS, provide **PWSID.** ___	
___	✓	___	Will courier charges apply?	
___	___	___	Method of payment? ___	
___	✓	___	Data package required? (Level: 1 / 2 / 3 / 4)	
			Notes: ___	
___	✓	___	Is this a DoD project? (USACE, Navy, AFCEE)	

Delivery method (circle all that apply): (Client)
Alert Courier / UPS / FedEx / USPS /
AA Goldstreak / NAC / ERA / PenAir / Carlile
Lynden / SGS / Other: ___

Airbill # ___

Additional Sample Remarks: *(√ if applicable)*
___ Extra Sample Volume?
___ Limited Sample Volume?
___ Field preserved for volatiles?
___ Field-filtered for dissolved? ___
___ Lab-filtered for dissolved? ___
___ Ref Lab required? ___
___ Foreign Soil?

This section must be filled out for DoD projects (USACE, Navy, AFCEE)

Yes	No		
___	___	Is received temperature 4 ± 2°C?	
		Exceptions:	Samples/Analyses Affected:
___	___	Rad Screen performed? Result: ___	
___	___	Was there an airbill? *(Note # above in the right hand column)*	
___	___	Was cooler sealed with custody seals?	
		# / where: ___	
___	___	Were seal(s) intact upon arrival?	
___	___	Was there a COC with cooler?	
___	___	Was COC sealed in plastic bag & taped inside lid of cooler?	
___	___	Was the COC filled out properly?	
___	___	Did the COC indicate COE / AFCEE / Navy project?	
___	___	Did the COC and samples correspond?	
___	___	Were all sample packed to prevent breakage?	
		Packing material: ___	
___	___	Were all samples unbroken and clearly labeled?	
___	___	Were all samples sealed in separate plastic bags?	
___	___	Were all VOCs free of headspace and/or MeOH preserved?	
___	___	Were correct container / sample sizes submitted?	
___	___	Is sample condition good?	
___	___	Was copy of CoC, SRF, and custody seals given to PM to fax?	

This section must be filled if problems are found.

Yes No
___ ___ Was client notified of problems?

Individual contacted: ___
Via: Phone / Fax / Email (*circle one*)
Date/Time: ___
Reason for contact: ___

Change Order Required? ___
SGS Contact: ___

Notes: ___

Completed by (sign): ___ **(print):** Tor Rud.

Login proof (check one): waived ___ required ___ performed by: ___

SGS

1074592

SAMPLE RECEIPT FORM (page 2)

SGS WO#

#	Container ID	Matrix	Test	QC	TB	Container Volume: 1 L	500 mL	250 mL	125 mL	60 mL	40 mL	8oz (250 mL)	4oz (125 mL)	Other	Container Type: AG	CG	HDPE	Nalgene	Cubie	Coli	Septa	Other	Preservative: None	HCl	HNO_3	H_2SO_4	MeOH	$Na_2S_2O_3$	NaOH	Other
1-5	A	1	metals SE, As PB, Hg					5									✓								✓					
6,7	AB		DRO/RRO 102 103			4									✓									✓						
8-10	A-C		GRO/BTEX AK101 8021B								9				✓						✓			✓						
11	A-C		GRO/BTEX AK101 8021B		✓						3				✓						✓			✓						
Bottle Totals						4		5			12																			

Completed by: _____ Date: 9/6/07

\\petra\public\DOCUMENT\FORMS\approved\SRF_F004r14.doc

Form # F004r14 : 05/17/04

Laboratory Data Review Checklist

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   ☑ Yes ☐ No 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 Comments:

   NA

2. Chain of Custody (COC)

   a. COC information completed, signed, and dated (including released/received by)?

   ☑ Yes ☐ No Comments:

   b. Correct analyses requested?

   ☑ Yes ☐ No Comments:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?

   ☑ Yes ☐ No Comments:

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   ☑ Yes ☐ No Comments:

   c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

   ☐ Yes ☐ No Comments:

   NA

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

☐ Yes ☐ No Comments:

NA

e. Data quality or usability affected? Explain.

Comments:

NA

4. Case Narrative

a. Present and understandable?

☒ Yes ☐ No Comments:

b. Discrepancies, errors or QC failures identified by the lab?

☒ Yes ☐ No Comments:

c. Were all corrective actions documented?

☒ Yes ☐ No Comments:

d. What is the effect on data quality/usability according to the case narrative?

Comments:

No effect on data quality

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

☒ Yes ☐ No Comments:

b. All applicable holding times met?

☒ Yes ☐ No Comments:

c. All soils reported on a dry weight basis?

☐ Yes ☐ No Comments:

NA

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

☑ Yes ☐ No Comments:

e. Data quality or usability affected? Explain.

Comments:

NO

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

☑ Yes ☐ No Comments:

ii. All method blank results less than PQL?

☑ Yes ☐ No Comments:

iii. If above PQL, what samples are affected?

Comments:

NA

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No Comments:

NA

v. Data quality or usability affected? Explain.

Comments:

NO

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

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples?

☑ Yes ☐ No Comments:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

☑ Yes ☐ No 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 Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

☑ Yes ☐ No Comments:

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

Comments:

NA

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No Comments:

NA

vii. Data quality or usability affected? Explain.

Comments:

NA

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?

☑ Yes ☐ No 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 Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No Comments:

NA

iv. Data quality or usability affected? Explain.

Comments:

NO

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and cooler?

☑ Yes ☐ No Comments:

ii. All results less than PQL?

☑ Yes ☐ No Comments:

iii. If above PQL, what samples are affected?

Comments:

NA

iv. Data quality or usability affected? Explain.

Comments:

NO

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

☑ Yes ☐ No Comments:

ii. Submitted blind to lab?

☒ Yes ☐ No Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

☒ Yes ☐ No Comments:

No analytes detected in Sample RDM33B or its duplicate RDM55B; therefore, RPD were not calculated.

iv. Data quality or usability affected? Explain.

Comments:

NO

f. Decontamination or Equipment Blank (if applicable)

☐ Yes ☐ No ☒ Not Applicable

i. All results less than PQL?

☐ Yes ☐ No Comments:

NA

ii. If above PQL, what samples are affected?

Comments:

NA

iii. Data quality or usability affected? Explain.

Comments:

NA

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

a. Defined and appropriate?

☒ Yes ☐ No Comments:

Completed by:	Nicholas E. Protos
Title:	Sr. Environmental Engineer
Date:	September 20, 2007
CS Report Name:	2007 Groundwater Monitoring, Red Devil Mine, Red Devil, Alaska
Report Date:	November 01, 2007
Consultant Firm:	Shannon & Wilson, Inc.
Laboratory Name:	SGS Environmental Services
Laboratory Report Number:	1074592
ADEC File Number:	2442.38.001
ADEC RecKey Number:	1988250927601

ATTACHMENT 3

"IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICHAL/ENVIRONMENTAL REPORT"

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

Attachment to Report: 32-1-17124

Dated: December 2007

To: Bureau of Land Management

Re 2007 Groundwater Monitoring, Red Devil Mine, Red Devil, Alaska

Important Information About Your Environmental Site Assessment/Evaluation Report

ENVIRONMENTAL SITE ASSESSMENTS/EVALUATIONS ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

This report was prepared to meet the needs you specified with respect to your specific site and your risk management preferences. Unless indicated otherwise, we prepared your report expressly for you and for the purposes you indicated. No one other than you should use this report for any purpose without first conferring with us. No one is authorized to use this report for any purpose other than that originally contemplated without our prior written consent.

The findings and conclusions documented in this site assessment/evaluation have been prepared for specific application to this project and have been developed in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in this area. The conclusions presented are based on interpretation of information currently available to us and are made within the operational scope, budget, and schedule constraints of this project. No warranty, express or implied, is made.

OUR REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

Our environmental site assessment is based on several factors and may include (but not be limited to): reviewing public documents to chronicle site ownership for the past 30, 40, or more years; investigating the site's regulatory history to learn about permits granted or citations issued; determining prior uses of the site and those adjacent to it; reviewing available topographic and real estate maps, historical aerial photos, geologic information, and hydrologic data; reviewing readily available published information about surface and subsurface conditions; reviewing federal and state lists of known and potentially contaminated sites; evaluating the potential for naturally occurring hazards; and interviewing public officials, owners/operators, and/or adjacent owners with respect to local concerns and environmental conditions.

Except as noted within the text of the report, no sampling or quantitative laboratory testing was performed by us as part of this site assessment. Where such analyses were conducted by an outside laboratory, Shannon & Wilson relied upon the data provided and did not conduct an independent evaluation regarding the reliability of the data.

CONDITIONS CAN CHANGE.

Site conditions, both surface and subsurface, may be affected as a result of natural processes or human influence. An environmental site assessment/evaluation is based on conditions that existed at the time of the evaluation. Because so many aspects of a historical review rely on third party information, most consultants will refuse to certify (warrant) that a site is free of contaminants, as it is impossible to know with absolute certainty if such a condition exists. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas that showed no signs of contamination at the time they were studied.

Unless your consultant indicates otherwise, your report should not be construed to represent geotechnical subsurface conditions at or adjacent to the site and does not provide sufficient information for construction-related activities. Your report also should not be used following floods, earthquakes, or other acts of nature; if the size or configuration of the site is altered; if the location of the site is modified; or if there is a change of ownership and/or use of the property.

INCIDENTAL DAMAGE MAY OCCUR DURING SAMPLING ACTIVITIES.

Incidental damage to a facility may occur during sampling activities. Asbestos and lead-based paint sampling often require destructive sampling of pipe insulation, floor tile, walls, doors, ceiling tile, roofing, and other building materials. Shannon & Wilson does not provide for paint repair. Limited repair of asbestos sample locations are provided. However, Shannon & Wilson neither warranties repairs made by our field personnel, nor are we held liable for injuries or damages as a result of those repairs. If you desire a specific form of repair, such as those provided by a licensed roofing contractor, you need to request the specific repair at the time of the proposal. The owner is responsible for repair methods that are not specified in the proposal.

READ RESPONSIBILITY CLAUSES CAREFULLY.

Environmental site assessments/evaluations are less exact than other design disciplines because they are based extensively on judgment and opinion, and there may not have been any (or very limited) investigation of actual subsurface conditions. Wholly unwarranted claims have been lodged against consultants. To limit this exposure, 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 responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses may appear in this report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

Consultants cannot accept responsibility for problems that may develop if they are not consulted after factors considered in their reports have changed, or conditions at the site have changed. Therefore, it is incumbent upon you to notify your consultant of any factors that may have changed prior to submission of the final assessment/evaluation.

An assessment/evaluation of a site helps reduce your risk, but does not eliminate it. Even the most rigorous professional assessment may fail to identify all existing conditions.

ONE OF THE OBLIGATIONS OF YOUR CONSULTANT IS TO PROTECT THE SAFETY, HEALTH, PROPERTY, AND WELFARE OF THE PUBLIC.

If our environmental site assessment/evaluation discloses the existence of conditions that may endanger the safety, health, property, or welfare of the public, we may be obligated under rules of professional conduct, statutory law, or common law to notify you and others of these conditions.

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