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QUARTERLY GROUNDWATER MONITORING REPORT
(March 2013 Event)

Property:

K-51 Pipeline Release
Sections 34 and 35, T26N, R6W
Rio Arriba County, New Mexico
SWG Project No. 0410003
May 20, 2013

Prepared for:
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(March 2013 Event)

K-51 Pipeline Release
Sections 34 and 35, T26N, R6W
Rio Arriba County, New Mexico

SWG Project No. 0410G003

1.0 INTRODUCTION

1.1 Site Description & Background

The K-51 pipeline release site is located at the boundary of Sections 34 and 35, Township 26 North, Range 6 West, in Rio Arriba County, New Mexico, referred to hereinafter as the "Site" or "subject Site". The Site consists of silty/sandy canyon bottomland with native grasses, and is crossed by a natural gas pipeline operated by Enterprise Field Services, LLC (Enterprise).

On April 13, 2010, approximately 10 barrels of natural gas condensate were released from the Enterprise natural gas gathering pipeline at the Site, due to internal corrosion. Subsequent to the completion of excavation and off-site disposal of petroleum hydrocarbon affected soils, confirmation soil samples were collected from the excavation by Souder, Miller and Associates (SMA). In addition, one (1) groundwater sample was collected from the groundwater which recharged into the excavation. The excavation was then backfilled with unaffected soils.

In June 2010, eight (8) soil borings (BH-1 through BH-8) were advanced on-site by LT Environmental (LTE). Subsequent to advancement, four (4) of the soil borings were converted to groundwater monitoring wells (MW-1 through MW-4) (*Subsurface Investigation Report, dated August 9, 2010 – LTE*). Based on the results of soil and groundwater sampling activities, constituent of concern (COC) concentrations were identified in soil above the New Mexico Energy, Minerals and Natural Resources Department (EMNRD), Oil Conservation Division (OCD) *Remediation Action Levels* (RALs) and in groundwater above the New Mexico Water Quality Control Commission (WQCC) *Groundwater Quality Standards (GQSs).*

During April 2011, nine (9) soil borings (SB-9, SB-10, MW-11 through MW-14, SB-15, MW-16, and MW-17) were advanced by Southwest Geoscience (SWG) in and around the former K-51 release area to further evaluate the extent of dissolved phase COCs in groundwater. Additionally, fifteen (15) injection points were installed to allow In-Situ Chemical Oxidation (ISCO) of the COCs. ISCO activities were performed during May 2011 (*Supplemental Site Investigation and Corrective Action Report, dated October 5, 2011 - SWG*).

Based on the distribution of COCs in groundwater, a former drip valve may have been a historic source of petroleum hydrocarbon impact to groundwater in the vicinity of monitoring well MW-14. During March 2012, three (3) additional soil borings (MW-18,

MW-19 and MW-20) were advanced in and around the former drip valve area to further evaluate the extent COCs in groundwater as a result of the release (*Supplemental Site Investigation & Corrective Action Work Plan, dated April 23, 2012 – SWG*). Soil boring MW-18 was advanced to the west of the former drip valve, hydrogeologically cross-gradient, and soil borings MW-19 and MW-20 were advanced to the north and northwest of the drip valve, hydrogeologically down-gradient.

The Site is subject to regulatory oversight by the New Mexico EMNRD OCD. To address activities related to condensate releases, the New Mexico OCD utilizes the *Guidelines for Remediation of Leaks, Spills and Releases* as guidance, in addition to the OCD rules, specifically NMAC 19.15.30 Remediation. These guidance documents establish investigation and abatement action requirements for sites subject to reporting and/or corrective action.

The Site location is depicted on Figure 1 of Appendix A which was reproduced from a portion of the United States Geological Survey (USGS) 7.5-minute series topographic map.

1.2 Scope of Work

The objective of the groundwater monitoring event was to further evaluate the concentrations of COCs in groundwater at the Site.

A Site Vicinity Map is included as Figure 2, and a Site Map, which indicates the approximate locations of the monitoring wells in relation to pertinent structures and general Site boundaries, is included as Figure 3 of Appendix A.

1.3 Standard of Care & Limitations

The findings and recommendations contained in this report represent SWG's professional opinions based upon information derived from on-Site activities and other services performed under this scope of work and were arrived at in accordance with currently acceptable professional standards. The findings were based upon analytical results provided by an independent laboratory. Evaluations of the geologic/hydrogeologic conditions at the Site for the purpose of this investigation are made from a limited number of available data points (i.e. soil borings and ground water samples) and site wide subsurface conditions may vary from these data points. SWG makes no warranties, express or implied, as to the services performed hereunder. Additionally, SWG does not warrant the work of third parties supplying information used in the report (e.g. laboratories, regulatory agencies, or other third parties).

This report is based upon a specific scope of work requested by Enterprise. The agreement between SWG and Enterprise outlines the scope of work, and only those tasks specifically authorized by that agreement or outlined in this report were performed. This report has been prepared for the intended use of Enterprise, and any authorization for use or reliance by any other party (except a governmental entity having jurisdiction over the Site) is prohibited without the express written authorization of Enterprise and SWG.

2.0 SAMPLING PROGRAM

A quarterly groundwater sampling event was conducted on March 25th, 2013 by Kyle Summers, a SWG environmental professional.

SWG's groundwater sampling program consisted of the following:

- Collection of one groundwater sample from each monitoring well utilizing low-flow sampling techniques. MW-20 was purged and sampled utilizing a disposable bailer because the depth to water at this location exceeds the lift capability of the peristaltic pump. MW-18 was not sampled during this event due to inadequate recovery.

Prior to sample collection, SWG gauged the depth to fluids in each monitoring well using an interface probe capable of detecting light non-aqueous phase liquids (LNAPL). LNAPL was not identified at any monitoring well locations during the March 2013 gauging activities.

Prior to sample collection, each of the monitoring wells (with the exception of monitoring well MW-20) was micro-purged utilizing low-flow sampling techniques. Low-flow refers to the velocity with which groundwater enters the pump intake and that is imparted to the formation pore water in the immediate vicinity of the well screen. It does not necessarily refer to the flow rate of water discharged at the surface which can be affected by flow regulators or restrictions. Water level drawdown provides the best indication of the stress imparted by a given flow-rate for a given hydrological situation. The objective is to pump in a manner that minimizes stress (drawdown) to the system, to the extent practical, taking into account established Site sampling objectives. Flow rates on the order of 0.1 to 0.5 L/min will be maintained during sampling activities, using dedicated sampling equipment.

The utilization of low-flow minimal drawdown techniques enables the isolation of the screened interval groundwater from the overlying stagnant casing water. The pump intake is placed within the screened interval such that the groundwater recovered is drawn in directly from the formation with little mixing of casing water or disturbance to the sampling zone.

The low-flow groundwater samples were collected from each monitoring well once produced groundwater was consistent in color, clarity, pH, DO, ORP, temperature and conductivity.

Monitoring well MW-20 was purged of three (3) casing volumes utilizing a disposable bailer, and sampled following groundwater recharge.

Groundwater samples were collected in laboratory prepared $HgCl_2$ preserved containers, sealed with custody tape and placed on ice in a cooler secured with a custody seal. The sample coolers and completed chain-of-custody forms were relinquished to Hall Environmental Analysis Laboratory (HEAL) in Albuquerque, New Mexico.

3.0 LABORATORY ANALYTICAL PROGRAM

The groundwater samples collected from the monitoring wells during the groundwater sampling event were analyzed for total petroleum hydrocarbons (TPH) gasoline range organics (GRO) and diesel range organics (DRO) utilizing EPA method SW-846#8015M, and benzene, toluene, ethylbenzene and xylenes (BTEX) utilizing EPA method SW-846 #8021B.

A summary of the analysis, sample type, number of samples and EPA-approved methods are presented on the following table:

Analysis	Sample Type	No. of Samples	Method
TPH GRO/DRO	Groundwater	12	SW-846# 8015M
BTEX	Groundwater	12	SW-846# 8021B

Laboratory results are summarized in Table 1 included in Appendix B. The executed chain-of-custody form and laboratory data sheets are provided in Appendix C.

4.0 GROUNDWATER FLOW DIRECTION

The monitoring wells have been surveyed to determine top-of-casing (TOC) elevations. Prior to sample collection, SWG gauged the depth to fluids in each monitoring well. The groundwater flow direction at the Site is generally towards the west-northwest. The observed gradient during this monitoring event was approximately 0.007 ft/ft across the Site.

Groundwater measurements collected during the most recent gauging event in March 2013 are presented with TOC elevations in Table 2, Appendix B. A groundwater gradient map depicting the most recent gauging data is included as Figure 4 (Appendix A).

5.0 DATA EVALUATION

The Site is subject to regulatory oversight by the New Mexico EMNRD OCD. To address activities related to crude oil/condensate related releases, the New Mexico EMNRD OCD utilizes the *Guidelines for Remediation of Leaks, Spills and Releases* as guidance, in addition to the EMNRD/OCD rules, specifically NMAC 19.15.30 Remediation. These guidance documents establish investigation and abatement action requirements for sites subject to reporting and/or corrective action.

5.1 Groundwater Samples

SWG compared BTEX concentrations or laboratory reporting limits (RLs) associated with the groundwater samples collected from monitoring wells during the March 2013 sampling event to the New Mexico WQCC *Groundwater Quality Standards*. The results

of the groundwater sample analyses are summarized in Table 1 of Appendix B. A Groundwater Quality Exceedance Zone map is provided as Figure 5 of Appendix A.

Benzene, Toluene, Ethylbenzene, and Xylenes

The groundwater samples collected from monitoring wells MW-2, MW-3, MW-4, MW-11, MW-12, MW-13, MW-14, MW-16, MW-17, MW-18, and MW-20 during the March 2013 sampling event did not exhibit benzene, toluene, ethylbenzene or xylenes concentrations above the respective WQCC *Groundwater Quality Standards*.

The groundwater samples collected from monitoring wells MW-1and MW-19 during the March 2013 sampling event exhibited benzene concentrations of 41 µg/L and 160 µg/L respectively, which exceed the WQCC *Groundwater Quality Standard* of 10 µg/L.

TPH GRO/DRO

The groundwater samples collected from monitoring wells MW-2, MW-3, MW-11, MW-12, MW-13, MW-14, MW-16, MW-17, and MW-20 did not exhibit TPH GRO or TPH DRO concentrations above the laboratory RLs during the March 2013 sampling event.

The groundwater samples collected from monitoring wells MW-1, MW-4, and MW-19 exhibited TPH GRO concentrations ranging from 0.27 mg/L to 1.5 mg/L. The highest GRO concentration during the March 2013 sampling event was observed in the groundwater sample from monitoring well MW-19.

TPH DRO concentrations were not identified above the laboratory RLs in any of the sampled wells except monitoring well MW-19, which exhibited a TPH DRO concentration of 1.4 mg/L.

6.0 FINDINGS

During March 2013, SWG conducted a quarterly groundwater monitoring event at the K-51 Pipeline release site. The Site is located at the boundary of Sections 34 and 35, Township 26 North, Range 6 West, in Rio Arriba County, New Mexico. The Site consists of silty/sandy canyon bottomland with native grasses, and is crossed by a natural gas pipeline operated by Enterprise. The objective of the groundwater monitoring event was to further evaluate the concentrations of COCs in groundwater at the Site.

- During the completion of the sampling event, one (1) groundwater sample was collected from each monitoring well utilizing either low-flow sampling techniques or purge and sample (disposable bailer) sampling techniques. Monitoring well MW-18 was not sampled due to inadequate recovery.

- The groundwater samples collected from monitoring wells MW-2, MW-3, MW-4, MW-11, MW-12, MW-13, MW-14, MW-16, MW-17, MW-18, and MW-20 during the March 2013 sampling event did not exhibit benzene, toluene, ethylbenzene or xylenes concentrations above the respective WQCC *Groundwater Quality Standards*.

- The groundwater samples collected from monitoring wells MW-1and MW-19

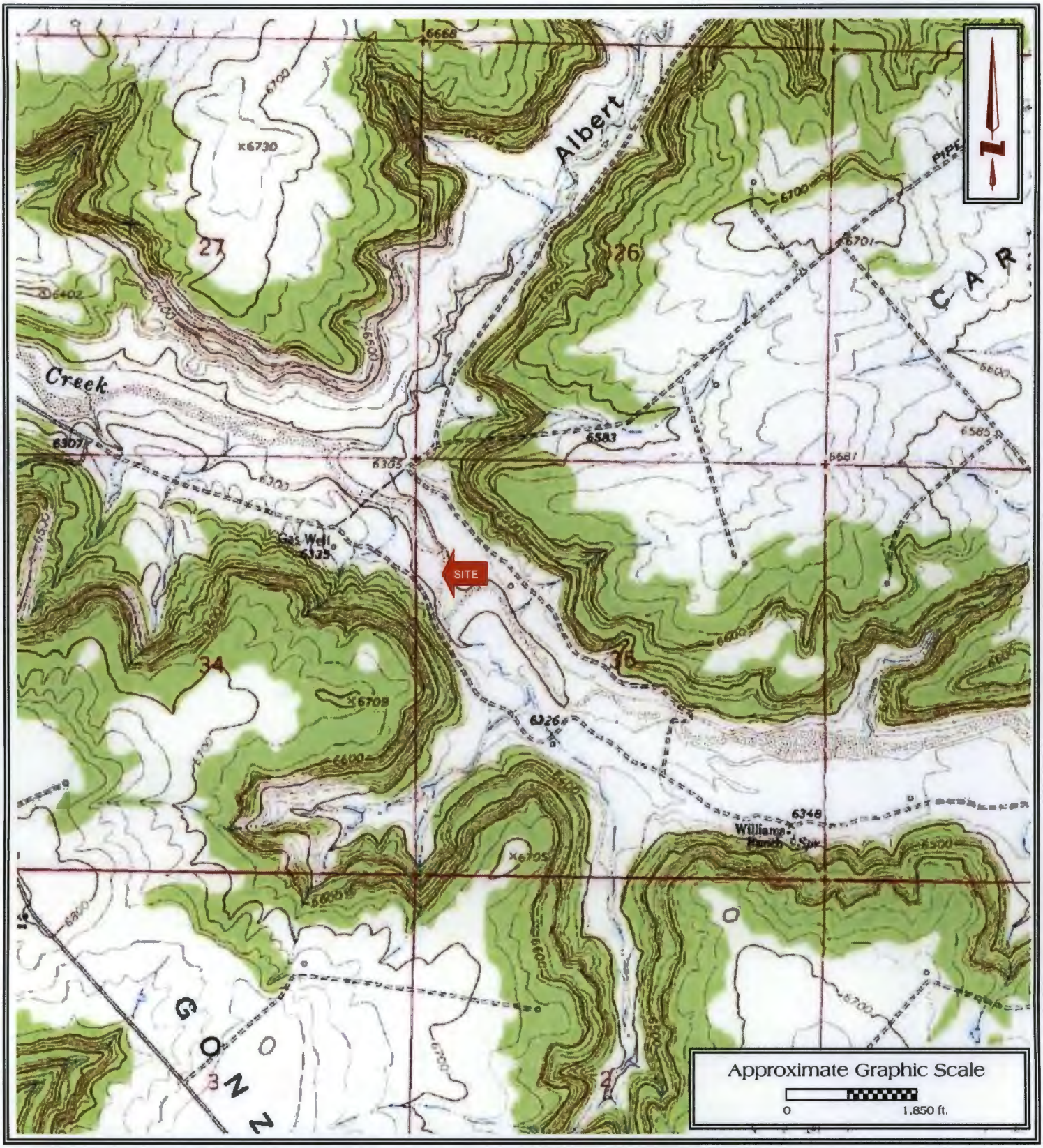
during the March 2013 sampling event exhibited benzene concentrations of 41 µg/L and 160 µg/L respectively, which exceed the WQCC ***Groundwater Quality Standard*** of 10 µg/L.

- Based on analytical results, the COCs in groundwater at the Site continue to demonstrate a generally decreasing trend in concentrations.

7.0 RECOMMENDATIONS

Based on the results of groundwater monitoring activities, SWG has the following recommendations:

- Report the groundwater monitoring results to the OCD,
- Continue monitoring groundwater at the site.



K-51 Pipeline Release
N36° 26' 47.77"; W107° 26' 46.04"
Off County Road 537
Rio Arriba, New Mexico

SWG Project No. 0410003

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FIGURE 1
Topographic Map
Gonzales Mesa, NM Quadrangle
Contour Interval - 10 Feet

K-51 Pipeline Release
N36° 26' 47.77"; W107° 26' 46.04"
Off County Road 537
Rio Arriba, New Mexico

SWG Project No. 0410003

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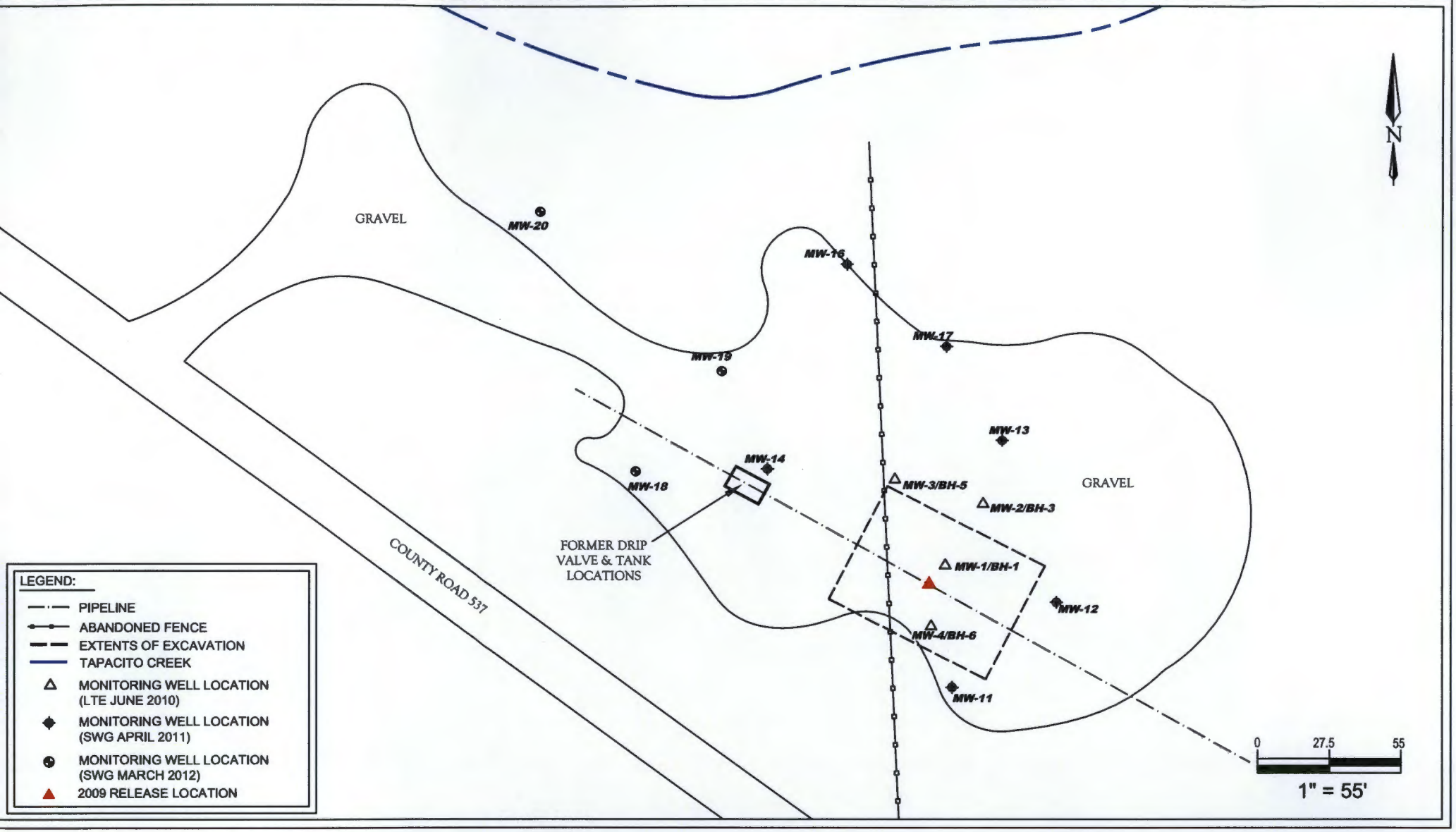
FIGURE 2
Site Vicinity Map
2012 Aerial Photograph



K-51 Pipeline Release
N36° 26' 47.77"; W107° 26' 46.04"
Off County Road 537
Rio Ariba County, New Mexico

SWG Project No. 0410003

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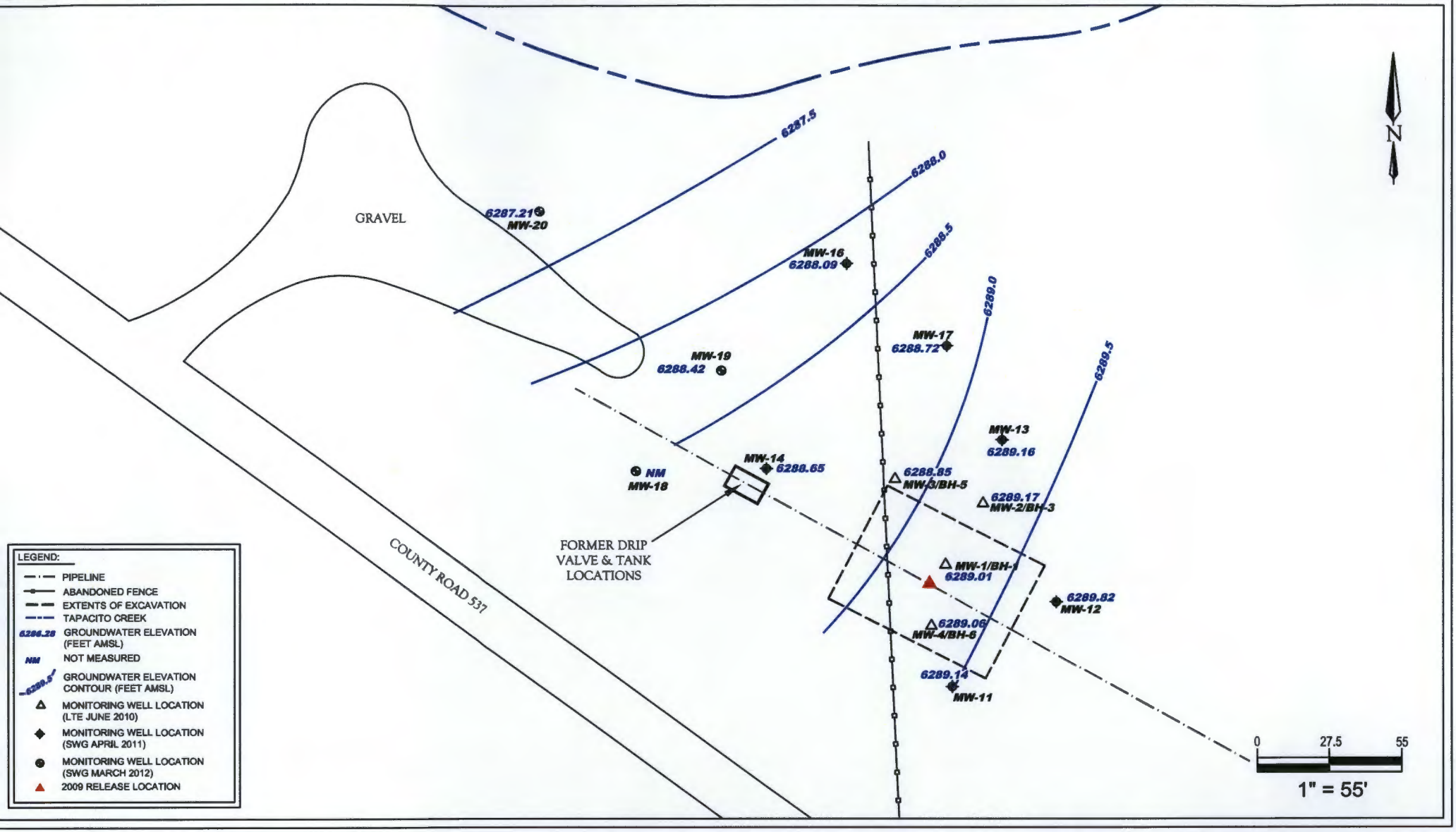
FIGURE 3

SITE MAP



K-51 Pipeline Release
N36° 26' 47.77"; W107° 26' 46.04"
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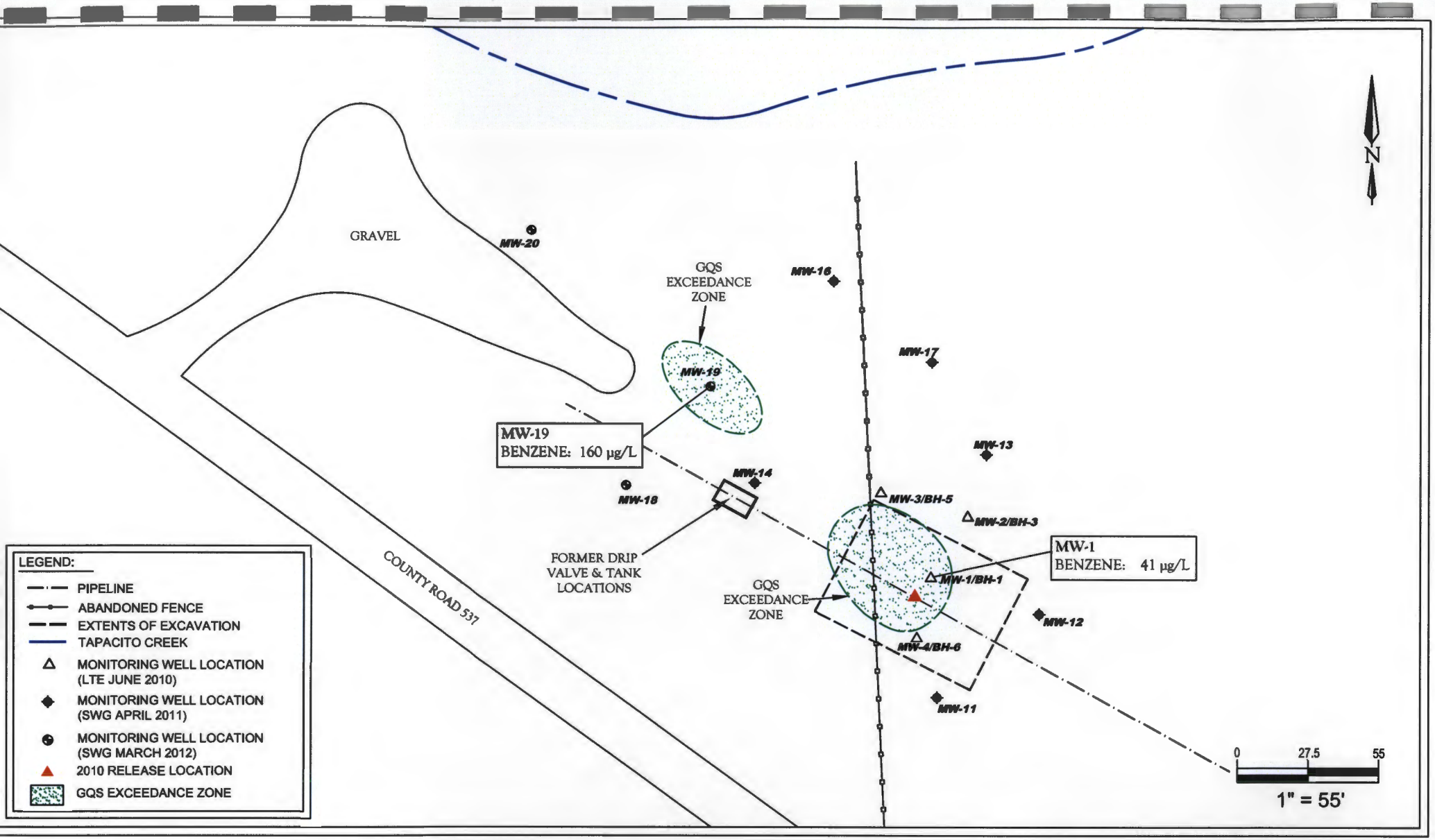
FIGURE 4

GROUNDWATER GRADIENT MAP

MARCH 2013



K-51 Pipeline Release
N36° 26' 47.77"; W107° 26' 46.04"
Off County Road 537
Rio Ariba County, New Mexico

SWG Project No. 0410003

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FIGURE 5

GROUNDWATER QUALITY STANDARD EXCEEDANCE ZONE MARCH 2013

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TABLE 1
K-51 PIPELINE RELEASE
GROUNDWATER ANALYTICAL SUMMARY

Sample I.D.	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	TPH GRO (mg/L)	TPH DRO (mg/L)
New Mexico Water Quality Control Commmission Groundwater Quality Standards		10	750	750	620	NE	NE
SMA Sample - Open Excavation							
Excavation	4.21.10	7,000	13,000	540	5,200	NA	NA
Monitoring Wells							
MW-1	6.21.10	8,400	1,300	560	4,200	NA	NA
	9.24.10	2,300	28	200	520	8.4	<1.0
	4.21.11	430	<20	120	60	2.1	<1.0
	6.21.11	820	370	33	140	5.1	130
	9.22.11	690	1,200	120	1,200	8.9	30
	12.13.11	260	250	54	650	3.4	<1.0
	3.20.12	280	230	94	550	3.5	<1.0
	6.19.12	300	<5.0	81	96	1.7	<1.0
	9.20.12*	45	3.4	15	23	0.45	<1.0
	12.17.12	34	<1.0	11	16	0.19	<1.0
	3.25.13	41	<1.0	19	32	0.27	<1.0
MW-2	6.21.10	200	53	14	96	NA	NA
	9.24.10	2.3	<1.0	<1.0	<2.0	<0.050	<1.0
	4.21.11	3.3	<1.0	<1.0	<2.0	0.065	<1.0
	6.21.11	2.2	<1.0	<1.0	<2.0	<0.050	<1.0
	9.22.11	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	12.13.11	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	3.20.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	6.19.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	9.19.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	12.17.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	3.25.13	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
MW-3	6.21.10	640	57	72	1,000	NA	NA
	9.24.10	150	<1.0	16	28	0.48	<1.0
	4.21.11	52	<1.0	17	10	0.25	<1.0
	6.21.11	62	14	13	160	0.67	<1.0
	9.22.11	3	<1.0	8.7	<2.0	0.066	<1.0
	12.13.11	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	3.20.12	1.3	<1.0	1.9	<2.0	<0.050	<1.0
	6.19.12	3.1	<1.0	1.4	<2.0	<0.050	<1.0
	9.19.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	12.17.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	3.25.13	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0

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TABLE 1
K-51 PIPELINE RELEASE
GROUNDWATER ANALYTICAL SUMMARY

Sample I.D.	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	TPH GRO (mg/L)	TPH DRO (mg/L)
New Mexico Water Quality Control Commmission Groundwater Quality Standards		10	750	750	620	NE	NE
MW-4	6.21.10	3,600	10,000	600	6,600	NA	NA
	9.24.10	870	870	260	1,600	12	1
	4.21.11	670	<20	520	790	6.3	<1.0
	6.21.11	17	22	36	77	0.64	1.1
	9.22.11	62	140	220	820	3.8	1.2
	12.13.11	84	<20	430	490	2.6	<1.0
	3.20.12	36	<20	1,100	1,400	6.5	<1.0
	6.19.12	37	<5.0	250	350	2.2	<1.0
	9.19.12	9.4	1.4	74	97	0.84	<1.0
	12.17.12	<1.0	<1.0	6.2	9.7	0.12	<1.0
	3.25.13	3.2	<1.0	51	55	1.0	<1.0
MW-11	4.21.11	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	6.21.11	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	9.22.11	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	12.13.11	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	3.20.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	6.19.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	9.19.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	12.17.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	3.25.13	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
MW-12	4.21.11	1.9	<1.0	<1.0	<2.0	<0.050	<1.0
	6.21.11	4.6	<1.0	<1.0	<2.0	0.063	<1.0
	9.22.11	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	12.13.11	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	3.20.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	6.19.12	1.7	<1.0	<1.0	<2.0	<0.050	<1.0
	9.19.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	12.17.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	3.25.13	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0

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TABLE 1
K-51 PIPELINE RELEASE
GROUNDWATER ANALYTICAL SUMMARY

Sample I.D.	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	TPH GRO (mg/L)	TPH DRO (mg/L)
New Mexico Water Quality Control Commmission Groundwater Quality Standards		10	750	750	620	NE	NE
MW-13	4.21.11	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	6.21.11	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	9.22.11	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	12.13.11	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	3.20.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	6.19.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	9.20.12	NS	NS	NS	NS	NS	NS
	12.17.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	3.25.13	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
MW-14	4.21.11	2,800	<100	280	720	8.7	<1.0
	6.21.11	470	<10	37	210	1.9	<1.0
	9.22.11	540	<10	100	36	1.7	<1.0
	12.13.11	220	<10	110	<20	1.0	<1.0
	3.20.12	660	<5.0	240	15	2.9	<1.0
	6.19.12	660	<5.0	300	100	3.4	<1.0
	9.20.12*	7.3	<1.0	<1.0	<2.0	0.1	<1.0
	12.17.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	3.25.13	<1.0	<1.0	1.6	<2.0	<0.050	<1.0
MW-16	4.21.11	4.4	<2.0	<2.0	<4.0	<0.10	<1.0
	6.21.11	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	9.22.11	<1.0	<1.0	<1.0	<2.0	0.065	<1.0
	12.13.11	<1.0	<1.0	<1.0	<2.0	0.12	<1.0
	3.20.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	6.19.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	9.19.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	12.17.12	3.1	<1.0	2.1	14	0.19	<1.0
	3.25.13	<1.0	<1.0	<1.0	<1.0	<0.050	<1.0
MW-17	4.21.11	<2.0	<2.0	<2.0	<4.0	<0.10	<1.0
	6.21.11	<2.0	<2.0	<2.0	<4.0	<0.10	<1.0
	9.22.11	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	12.13.11	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	3.20.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	6.19.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	9.19.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	12.17.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	3.25.13	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0

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TABLE 1
K-51 PIPELINE RELEASE
GROUNDWATER ANALYTICAL SUMMARY

Sample I.D.	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	TPH GRO (mg/L)	TPH DRO (mg/L)
New Mexico Water Quality Control Commmission Groundwater Quality Standards		10	750	750	620	NE	NE
MW-18	3.20.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	6.19.12	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	9.20.12*	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	12.17.12	<2.0	<2.0	<2.0	<4.0	<0.10	<1.0
	3.25.13	NS	NS	NS	NS	NS	NS
MW-19	3.20.12	**250**	56	310	**3,900**	16	5.3
	6.19.12	**NAPL**	**NAPL**	**NAPL**	**NAPL**	NA	NA
	9.19.12	**NAPL**	**NAPL**	**NAPL**	**NAPL**	NA	NA
	12.17.12	**180**	<5.0	5.4	23	2.2	2.6
	3.25.13	**160**	<5.0	17	<10	1.5	1.4
MW-20	3.20.12	**35**	<1.0	1.1	3.3	0.14	<1.0
	6.19.12	3.4	<1.0	<1.0	<2.0	<0.050	<1.0
	9.20.12*	4.7	<1.0	<1.0	<2.0	<0.050	<1.0
	12.17.12*	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0
	3.25.13	<1.0	<1.0	<1.0	<2.0	<0.050	<1.0

Note: Concentrations in **bold** and yellow exceed the applicable OCD Remediation Action Level

* = Monitoring well purged/sampled utilizing disposable bailer during this event

NA = Not Analyzed

NS = Not Sampled

NE = Not Established

NAPL = Non-aqueous phase liquid

Southwest GEOSCIENCE

TABLE 2
K-51 Pipeline Release
GROUNDWATER ELEVATIONS

Well I.D.	Date	Depth to Product (feet BTOC)	Depth to Water (feet BTOC)	Product Thickness	TOC Elevations (feet AMSL)	Groundwater Elevation* (feet AMSL)
MW-1	4.21.11	ND	11.80	ND	6300.89	6289.09
	6.21.11	ND	12.16	ND		6288.73
	9.22.11	ND	12.92	ND		6287.97
	12.13.11	ND	12.45	ND		6288.44
	3.20.12	ND	12.13	ND		6288.76
	6.19.12	ND	12.76	ND		6288.13
	9.19.12	ND	13.10	ND		6287.79
	12.17.12	ND	12.33	ND		6288.56
	3.15.13	ND	11.88	ND		6289.01
MW-2	4.21.11	ND	10.55	ND	6299.82	6289.27
	6.21.11	ND	11.87	ND		6287.95
	9.22.11	ND	11.86	ND		6287.96
	12.13.11	ND	11.38	ND		6288.44
	3.20.12	ND	10.95	ND		6288.87
	6.19.12	ND	11.64	ND		6288.18
	9.19.12	ND	12.10	ND		6287.72
	12.17.12	ND	11.23	ND		6288.59
	3.15.13	ND	10.65	ND		6289.17
MW-3	4.21.11	ND	11.30	ND	6300.22	6288.92
	6.21.11	ND	11.64	ND		6288.58
	9.22.11	ND	12.45	ND		6287.77
	12.13.11	ND	11.89	ND		6288.33
	3.20.12	ND	11.60	ND		6288.62
	6.19.12	ND	12.22	ND		6288.00
	9.19.12	ND	12.53	ND		6287.69
	12.17.12	ND	11.75	ND		6288.47
	3.15.13	ND	11.37	ND		6288.85
MW-4	4.21.11	ND	11.90	ND	6300.91	6289.01
	6.21.11	ND	12.18	ND		6288.73
	9.22.11	ND	12.90	ND		6288.01
	12.13.11	ND	12.41	ND		6288.50
	3.20.12	ND	12.45	ND		6288.46
	6.19.12	ND	12.72	ND		6288.19
	9.19.12	ND	13.09	ND		6287.82
	12.17.12	ND	12.33	ND		6288.58
	3.15.13	ND	11.85	ND		6289.06
MW-11	4.21.11	ND	11.98	ND	6301.19	6289.21
	6.21.11	ND	12.40	ND		6288.79
	9.22.11	ND	13.07	ND		6288.12
	12.13.11	ND	12.55	ND		6288.64
	3.20.12	ND	12.26	ND		6288.93
	6.19.12	ND	12.93	ND		6288.26
	9.19.12	ND	13.27	ND		6287.92
	12.17.12	ND	12.51	ND		6288.68
	3.15.13	ND	12.05	ND		6289.14
MW-12	4.21.11	ND	8.96	ND	6299.08	6290.12
	6.21.11	ND	9.42	ND		6289.66
	9.22.11	ND	10.82	ND		6288.26
	12.13.11	ND	10.13	ND		6288.95
	3.20.12	ND	9.41	ND		6289.67
	6.19.12	ND	10.09	ND		6288.99
	9.19.12	ND	11.03	ND		6288.05
	12.17.12	ND	10.21	ND		6288.87
	3.15.13	ND	9.26	ND		6289.82

Southwest GEOSCIENCE

TABLE 2
K-51 Pipeline Release
GROUNDWATER ELEVATIONS

MW-13	4.21.11	ND	9.07	ND	6298.27	6289.20
	6.21.11	ND	9.51	ND		6288.76
	9.22.11	ND	10.15	ND		6288.12
	12.13.11	ND	9.59	ND		6288.68
	3.20.12	ND	9.35	ND		6288.92
	6.19.12	ND	10.09	ND		6288.18
	9.19.12	ND	10.29	ND		6287.98
	12.17.12	ND	9.47	ND		6288.80
	3.15.13	ND	9.11	ND		6289.16
MW-14	4.21.11	ND	12.54	ND	6301.20	6288.66
	6.21.11	ND	12.88	ND		6288.32
	9.22.11	ND	13.53	ND		6287.67
	12.13.11	ND	13.11	ND		6288.09
	3.20.12	ND	12.80	ND		6288.40
	6.19.12	ND	13.42	ND		6287.78
	9.19.12	ND	13.70	ND		6287.50
	12.17.12	ND	12.93	ND		6288.27
	3.15.13	ND	12.55	ND		6288.65
MW-16	4.21.11	ND	12.06	ND	6299.89	6287.83
	6.21.11	ND	12.26	ND		6287.63
	9.22.11	ND	12.57	ND		6287.32
	12.13.11	ND	12.28	ND		6287.61
	3.20.12	ND	12.24	ND		6287.65
	6.19.12	ND	12.71	ND		6287.18
	9.19.12	ND	12.80	ND		6287.09
	12.17.12	ND	11.90	ND		6287.99
	3.15.13	ND	11.80	ND		6288.09
MW-17	4.21.11	ND	9.90	ND	6298.57	6288.67
	6.21.11	ND	9.56	ND		6289.01
	9.22.11	ND	10.83	ND		6287.74
	12.13.11	ND	10.31	ND		6288.26
	3.20.12	ND	10.12	ND		6288.45
	6.19.12	ND	10.81	ND		6287.76
	9.19.12	ND	10.95	ND		6287.62
	12.17.12	ND	10.13	ND		6288.44
	3.15.13	ND	9.85	ND		6288.72
MW-18	3.20.12	ND	16.60	ND	6304.77	6288.17
	6.19.12	ND	17.42	ND		6287.35
	9.19.12	ND	17.45	ND		6287.32
	12.17.12	ND	16.73	ND		6288.04
	3.15.13	ND	NG	ND		NG
MW-19	3.20.12	ND	15.69	ND	6303.80	6288.11
	6.19.12	16.25	16.32	0.07		6287.52
	9.19.12	16.47	16.49	0.02		6287.32
	12.17.12	ND	15.91	ND		6287.89
	3.15.13	ND	15.38	ND		6288.42
MW-20	3.20.12	ND	25.82	ND	6312.59	6286.77
	6.19.12	ND	26.30	ND		6286.29
	9.19.12	ND	26.31	ND		6286.28
	12.17.12	ND	25.42	ND		6287.17
	3.15.13	ND	25.38	ND		6287.21

BTOC - below top of casing

AMSL - aboce mean sea level

TOC - top of casing

* - corrected for presence of phase-sepated hydrocarbon using a site-specific density correction factor of 0.63

ND - Not Detected

NG - Not Gauged or Errant Gauge

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

April 03, 2013

Kyle Summers

Southwest Geoscience
606 S. Rio Grande Unit A
Aztec, NM 87410
TEL: (903) 821-5603
FAX

RE: K-51 OrderNo.: 1303B80

Dear Kyle Summers:

Hall Environmental Analysis Laboratory received 12 sample(s) on 3/29/2013 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1303B80**
Date Reported: **4/3/2013**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Client Sample ID: MW-3
Project: K-51
Collection Date: 3/25/2013 1:45:00 PM
Lab ID: 1303B80-001 **Matrix:** AQUEOUS **Received Date:** 3/29/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE						Analyst: **GSA**
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	4/1/2013 9:24:22 PM
Surr: DNOP	114	75.4-146		%REC	1	4/1/2013 9:24:22 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	3/29/2013 5:21:01 PM
Surr: BFB	74.4	51.9-148		%REC	1	3/29/2013 5:21:01 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	3/29/2013 5:21:01 PM
Toluene	ND	1.0		µg/L	1	3/29/2013 5:21:01 PM
Ethylbenzene	ND	1.0		µg/L	1	3/29/2013 5:21:01 PM
Xylenes, Total	ND	2.0		µg/L	1	3/29/2013 5:21:01 PM
Surr: 4-Bromofluorobenzene	80.2	69.4-129		%REC	1	3/29/2013 5:21:01 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Client Sample ID: MW-14
Project: K-51
Collection Date: 3/25/2013 2:20:00 PM
Lab ID: 1303B80-002 **Matrix:** AQUEOUS **Received Date:** 3/29/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE						Analyst: **GSA**
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	4/1/2013 9:51:35 PM
Surr: DNOP	121	75.4-146		%REC	1	4/1/2013 9:51:35 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	3/29/2013 6:46:56 PM
Surr: BFB	75.9	51.9-148		%REC	1	3/29/2013 6:46:56 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	3/29/2013 6:46:56 PM
Toluene	ND	1.0		µg/L	1	3/29/2013 6:46:56 PM
Ethylbenzene	1.6	1.0		µg/L	1	3/29/2013 6:46:56 PM
Xylenes, Total	ND	2.0		µg/L	1	3/29/2013 6:46:56 PM
Surr: 4-Bromofluorobenzene	82.0	69.4-129		%REC	1	3/29/2013 6:46:56 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Client Sample ID: MW-1
Project: K-51
Collection Date: 3/25/2013 3:20:00 PM
Lab ID: 1303B80-003
Matrix: AQUEOUS
Received Date: 3/29/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE						Analyst: **GSA**
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	4/1/2013 10:18:48 PM
Surr: DNOP	116	75.4-146		%REC	1	4/1/2013 10:18:48 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	0.27	0.050		mg/L	1	3/29/2013 7:15:32 PM
Surr: BFB	88.2	51.9-148		%REC	1	3/29/2013 7:15:32 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	41	1.0		µg/L	1	3/29/2013 7:15:32 PM
Toluene	ND	1.0		µg/L	1	3/29/2013 7:15:32 PM
Ethylbenzene	19	1.0		µg/L	1	3/29/2013 7:15:32 PM
Xylenes, Total	32	2.0		µg/L	1	3/29/2013 7:15:32 PM
Surr: 4-Bromofluorobenzene	84.5	69.4-129		%REC	1	3/29/2013 7:15:32 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Client Sample ID: MW-4
Project: K-51
Collection Date: 3/25/2013 4:00:00 PM
Lab ID: 1303B80-004
Matrix: AQUEOUS
Received Date: 3/29/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE						Analyst: **GSA**
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	4/1/2013 10:45:56 PM
Surr: DNOP	128	75.4-146		%REC	1	4/1/2013 10:45:56 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	1.0	0.050		mg/L	1	3/29/2013 9:38:42 PM
Surr: BFB	300	51.9-148	S	%REC	1	3/29/2013 9:38:42 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	3.2	1.0		µg/L	1	3/29/2013 9:38:42 PM
Toluene	ND	1.0		µg/L	1	3/29/2013 9:38:42 PM
Ethylbenzene	51	1.0		µg/L	1	3/29/2013 9:38:42 PM
Xylenes, Total	55	2.0		µg/L	1	3/29/2013 9:38:42 PM
Surr: 4-Bromofluorobenzene	178	69.4-129	S	%REC	1	3/29/2013 9:38:42 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Client Sample ID: MW-19
Project: K-51
Collection Date: 3/25/2013 4:40:00 PM
Lab ID: 1303B80-005 **Matrix:** AQUEOUS **Received Date:** 3/29/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE						Analyst: **GSA**
Diesel Range Organics (DRO)	1.4	1.0		mg/L	1	4/1/2013 11:13:10 PM
Surr: DNOP	126	75.4-146		%REC	1	4/1/2013 11:13:10 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	1.5	0.25		mg/L	5	3/29/2013 10:07:21 PM
Surr: BFB	99.3	51.9-148		%REC	5	3/29/2013 10:07:21 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	160	5.0		µg/L	5	3/29/2013 10:07:21 PM
Toluene	ND	5.0		µg/L	5	3/29/2013 10:07:21 PM
Ethylbenzene	17	5.0		µg/L	5	3/29/2013 10:07:21 PM
Xylenes, Total	ND	10		µg/L	5	3/29/2013 10:07:21 PM
Surr: 4-Bromofluorobenzene	85.0	69.4-129		%REC	5	3/29/2013 10:07:21 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Client Sample ID: MW-20
Project: K-51
Collection Date: 3/25/2013 5:00:00 PM
Lab ID: 1303B80-006
Matrix: AQUEOUS
Received Date: 3/29/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE						Analyst: **GSA**
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	4/1/2013 11:40:10 PM
Surr: DNOP	126	75.4-146		%REC	1	4/1/2013 11:40:10 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	3/29/2013 11:04:33 PM
Surr: BFB	83.2	51.9-148		%REC	1	3/29/2013 11:04:33 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	3/29/2013 11:04:33 PM
Toluene	ND	1.0		µg/L	1	3/29/2013 11:04:33 PM
Ethylbenzene	ND	1.0		µg/L	1	3/29/2013 11:04:33 PM
Xylenes, Total	ND	2.0		µg/L	1	3/29/2013 11:04:33 PM
Surr: 4-Bromofluorobenzene	85.0	69.4-129		%REC	1	3/29/2013 11:04:33 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Client Sample ID: MW-16
Project: K-51
Collection Date: 3/25/2013 10:00:00 AM
Lab ID: 1303B80-007
Matrix: AQUEOUS
Received Date: 3/29/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE						Analyst: **GSA**
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	4/2/2013 12:07:10 AM
Surr: DNOP	127	75.4-146		%REC	1	4/2/2013 12:07:10 AM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	3/29/2013 11:33:06 PM
Surr: BFB	74.3	51.9-148		%REC	1	3/29/2013 11:33:06 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	3/29/2013 11:33:06 PM
Toluene	ND	1.0		µg/L	1	3/29/2013 11:33:06 PM
Ethylbenzene	ND	1.0		µg/L	1	3/29/2013 11:33:06 PM
Xylenes, Total	ND	2.0		µg/L	1	3/29/2013 11:33:06 PM
Surr: 4-Bromofluorobenzene	79.2	69.4-129		%REC	1	3/29/2013 11:33:06 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Client Sample ID: MW-17
Project: K-51
Collection Date: 3/25/2013 10:45:00 AM
Lab ID: 1303B80-008 **Matrix:** AQUEOUS **Received Date:** 3/29/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE						Analyst: **GSA**
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	4/2/2013 12:34:24 AM
Surr: DNOP	139	75.4-146		%REC	1	4/2/2013 12:34:24 AM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	3/30/2013 12:01:39 AM
Surr: BFB	76.4	51.9-148		%REC	1	3/30/2013 12:01:39 AM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	3/30/2013 12:01:39 AM
Toluene	ND	1.0		µg/L	1	3/30/2013 12:01:39 AM
Ethylbenzene	ND	1.0		µg/L	1	3/30/2013 12:01:39 AM
Xylenes, Total	ND	2.0		µg/L	1	3/30/2013 12:01:39 AM
Surr: 4-Bromofluorobenzene	83.2	69.4-129		%REC	1	3/30/2013 12:01:39 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Client Sample ID: MW-13
Project: K-51
Collection Date: 3/25/2013 11:20:00 AM
Lab ID: 1303B80-009
Matrix: AQUEOUS
Received Date: 3/29/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE						Analyst: **GSA**
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	4/2/2013 1:01:37 AM
Surr: DNOP	139	75.4-146		%REC	1	4/2/2013 1:01:37 AM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	3/30/2013 12:30:21 AM
Surr: BFB	75.6	51.9-148		%REC	1	3/30/2013 12:30:21 AM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	3/30/2013 12:30:21 AM
Toluene	ND	1.0		µg/L	1	3/30/2013 12:30:21 AM
Ethylbenzene	ND	1.0		µg/L	1	3/30/2013 12:30:21 AM
Xylenes, Total	ND	2.0		µg/L	1	3/30/2013 12:30:21 AM
Surr: 4-Bromofluorobenzene	82.0	69.4-129		%REC	1	3/30/2013 12:30:21 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Client Sample ID: MW-12
Project: K-51
Collection Date: 3/25/2013 11:50:00 AM
Lab ID: 1303B80-010 **Matrix:** AQUEOUS **Received Date:** 3/29/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE						Analyst: **GSA**
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	4/2/2013 4:47:35 PM
Surr: DNOP	152	75.4-146	S	%REC	1	4/2/2013 4:47:35 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	3/30/2013 12:59:03 AM
Surr: BFB	76.7	51.9-148		%REC	1	3/30/2013 12:59:03 AM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	3/30/2013 12:59:03 AM
Toluene	ND	1.0		µg/L	1	3/30/2013 12:59:03 AM
Ethylbenzene	ND	1.0		µg/L	1	3/30/2013 12:59:03 AM
Xylenes, Total	ND	2.0		µg/L	1	3/30/2013 12:59:03 AM
Surr: 4-Bromofluorobenzene	83.2	69.4-129		%REC	1	3/30/2013 12:59:03 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Client Sample ID: MW-11
Project: K-51
Collection Date: 3/25/2013 12:25:00 PM
Lab ID: 1303B80-011
Matrix: AQUEOUS
Received Date: 3/29/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE						Analyst: **GSA**
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	4/2/2013 5:09:06 PM
Surr: DNOP	172	75.4-146	S	%REC	1	4/2/2013 5:09:06 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	3/30/2013 1:27:42 AM
Surr: BFB	75.2	51.9-148		%REC	1	3/30/2013 1:27:42 AM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	3/30/2013 1:27:42 AM
Toluene	ND	1.0		µg/L	1	3/30/2013 1:27:42 AM
Ethylbenzene	ND	1.0		µg/L	1	3/30/2013 1:27:42 AM
Xylenes, Total	ND	2.0		µg/L	1	3/30/2013 1:27:42 AM
Surr: 4-Bromofluorobenzene	80.7	69.4-129		%REC	1	3/30/2013 1:27:42 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Client Sample ID: MW-2
Project: K-51
Collection Date: 3/25/2013 1:05:00 PM
Lab ID: 1303B80-012
Matrix: AQUEOUS
Received Date: 3/29/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE						Analyst: **GSA**
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	4/2/2013 2:50:08 AM
Surr: DNOP	110	75.4-146		%REC	1	4/2/2013 2:50:08 AM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	3/30/2013 1:56:22 AM
Surr: BFB	74.8	51.9-148		%REC	1	3/30/2013 1:56:22 AM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	3/30/2013 1:56:22 AM
Toluene	ND	1.0		µg/L	1	3/30/2013 1:56:22 AM
Ethylbenzene	ND	1.0		µg/L	1	3/30/2013 1:56:22 AM
Xylenes, Total	ND	2.0		µg/L	1	3/30/2013 1:56:22 AM
Surr: 4-Bromofluorobenzene	81.1	69.4-129		%REC	1	3/30/2013 1:56:22 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1303B80**

03-Apr-13

Client: Southwest Geoscience

Project: K-51

Sample ID **MB-6755**	SampType: **MBLK**	TestCode: **EPA Method 8015B: Diesel Range**
Client ID: **PBW**	Batch ID: **6755**	RunNo: **9559**
Prep Date: **4/1/2013**	Analysis Date: **4/1/2013**	SeqNo: **272748** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	1.0								
Surr: DNOP	1.1		1.000		111	75.4	146			

Sample ID **LCS-6755**	SampType: **LCS**	TestCode: **EPA Method 8015B: Diesel Range**
Client ID: **LCSW**	Batch ID: **6755**	RunNo: **9559**
Prep Date: **4/1/2013**	Analysis Date: **4/1/2013**	SeqNo: **272749** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.7	1.0	5.000	0	115	64.4	132			
Surr: DNOP	0.57		0.5000		115	75.4	146			

Sample ID **LCSD-6755**	SampType: **LCSD**	TestCode: **EPA Method 8015B: Diesel Range**
Client ID: **LCSS02**	Batch ID: **6755**	RunNo: **9559**
Prep Date: **4/1/2013**	Analysis Date: **4/1/2013**	SeqNo: **272750** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.8	1.0	5.000	0	115	64.4	132	0.341	20	
Surr: DNOP	0.59		0.5000		117	75.4	146	0	0	

Sample ID **MB-6767**	SampType: **MBLK**	TestCode: **EPA Method 8015B: Diesel Range**
Client ID: **PBW**	Batch ID: **6767**	RunNo: **9559**
Prep Date: **4/1/2013**	Analysis Date: **4/2/2013**	SeqNo: **273216** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	1.2		1.000		120	75.4	146			

Sample ID **LCS-6767**	SampType: **LCS**	TestCode: **EPA Method 8015B: Diesel Range**
Client ID: **LCSW**	Batch ID: **6767**	RunNo: **9559**
Prep Date: **4/1/2013**	Analysis Date: **4/2/2013**	SeqNo: **273217** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	0.59		0.5000		118	75.4	146			

Sample ID **LCSD-6767**	SampType: **LCSD**	TestCode: **EPA Method 8015B: Diesel Range**
Client ID: **LCSS02**	Batch ID: **6767**	RunNo: **9559**
Prep Date: **4/1/2013**	Analysis Date: **4/2/2013**	SeqNo: **273218** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	0.61		0.5000		122	75.4	146	0	0	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH greater than 2
- RL Reporting Detection Limit
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1303B80**

03-Apr-13

Client: Southwest Geoscience

Project: K-51

Sample ID **5ML RB**	SampType: **MBLK**	TestCode: **EPA Method 8015B: Gasoline Range**
Client ID: **PBW**	Batch ID: **R9526**	RunNo: **9526**
Prep Date:	Analysis Date: **3/29/2013**	SeqNo: **271701** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	15		20.00		74.3	51.9	148			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015B: Gasoline Range**
Client ID: **LCSW**	Batch ID: **R9526**	RunNo: **9526**
Prep Date:	Analysis Date: **3/29/2013**	SeqNo: **271702** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.55	0.050	0.5000	0	111	73.2	124			
Surr: BFB	16		20.00		82.0	51.9	148			

Sample ID **1303B80-001AMS**	SampType: **MS**	TestCode: **EPA Method 8015B: Gasoline Range**
Client ID: **MW-3**	Batch ID: **R9526**	RunNo: **9526**
Prep Date:	Analysis Date: **3/29/2013**	SeqNo: **271708** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.54	0.050	0.5000	0	109	65.2	137			
Surr: BFB	16		20.00		81.7	51.9	148			

Sample ID **1303B80-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015B: Gasoline Range**
Client ID: **MW-3**	Batch ID: **R9526**	RunNo: **9526**
Prep Date:	Analysis Date: **3/29/2013**	SeqNo: **271709** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.52	0.050	0.5000	0	104	65.2	137	4.14	20	
Surr: BFB	16		20.00		82.0	51.9	148	0	0	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH greater than 2
- RL Reporting Detection Limit
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1303B80**

03-Apr-13

Client: Southwest Geoscience

Project: K-51

Sample ID **5ML RB**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBW**	Batch ID: **R9526**	RunNo: **9526**
Prep Date:	Analysis Date: **3/29/2013**	SeqNo: **271724** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	16		20.00		79.9	69.4	129			

Sample ID **100NG BTEX LCS**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSW**	Batch ID: **R9526**	RunNo: **9526**
Prep Date:	Analysis Date: **3/29/2013**	SeqNo: **271725** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	104	80	120			
Toluene	21	1.0	20.00	0	106	80	120			
Ethylbenzene	21	1.0	20.00	0	105	80	120			
Xylenes, Total	64	2.0	60.00	0	106	80	120			
Surr: 4-Bromofluorobenzene	17		20.00		85.7	69.4	129			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH greater than 2
- RL Reporting Detection Limit
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: Southwest Geoscience A Work Order Number: 1303B80 RcptNo: 1

Received by/date: AG 03/29/13

Logged By: Michelle Garcia 3/29/2013 10:00:00 AM

Completed By: Michelle Garcia 3/29/2013 12:01:06 PM

Reviewed By: 03/29/13

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Yes			

CHAIN OF CUSTODY RECORD

Southwest GEOSCIENCE
Environmental & Hydrogeologic Consultants

Office Location: Aztec
Project Manager: Summers

Laboratory: Hall
Address: ABQ, NM
Contact: Andy Freeman
Phone:
PO/SO #: 04106003

Sampler's Name: Kyle Summers
Sampler's Signature: Kyl

Proj. No.: 04106003
Project Name: K-51

Lab use only
Due Date:
Temp. of coolers when received (C°): 1.0
1 | 2 | 3 | 4 | 5
Page 1 of 2

ANALYSIS REQUESTED: TPH GRO/DRO 8015; BTEX 8021

Matrix	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	Start Depth	End Depth	No/Type of Containers: VOA	A/G 1 Lt.	250 ml	P/O			Lab Sample ID (Lab Use Only)
W	3/25/13	1345		X	MW-3			5				X	X	1303B80-001
		1420			MW-14									-002
		1520			MW-1									-003
		1600			MW-4									-004
		1640			MW-19									-005
		1700			MW-20									-006
		1000			MW-16									-007
		1045			MW-17									-008
		1120			MW-13									-009
		1150			MW-12									-010

Turn around time: ☒ Normal ☐ 25% Rush ☐ 50% Rush ☐ 100% Rush

Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	3/28/13	755	Christen Waelen	3/28/13	755
Relinquished by (Signature) Christen Waelen	3/28/13	1728		03/29/13	10:00
Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

NOTES:

Matrix: WW - Wastewater; W - Water; S - Soil; SD - Solid; L - Liquid; A - Air Bag; C - Charcoal tube; SL - sludge; O - Oil
Container: VOA - 40 ml vial; A/G - Amber / Or Glass 1 Liter; 250 ml - Glass wide mouth; P/O - Plastic or other

CHAIN OF CUSTODY RECORD

Southwest GEOSCIENCE
Environmental & Hydrogeologic Consultants

Laboratory: Hall
Address: ABQ
Contact: Andy Freeman
Phone:
PO/SO #: 04106003

Office Location: Aztec
Project Manager: Summers

Sampler's Name: Kyle Summers
Sampler's Signature:

Proj. No.: 04106003
Project Name: L-51

Lab use only
Due Date:
Temp. of coolers when received (C°): 1.0
1 | 2 | 3 | 4 | 5
Page 2 of 2

ANALYSIS REQUESTED: TPH GRO/DRO 8015 / BTEX 8021

Matrix	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	Start Depth	End Depth	No/Type of Containers: VOA	A/G 1 Lt.	250 ml	P/O	Lab Sample ID (Lab Use Only)
W	3/25/13	1225		X	MW-11			5				1303B80-011
W	3/25/13	1305		X	MW-2			5				1303B80-012

NES
1-5

Turn around time: ☒ Normal ☐ 25% Rush ☐ 50% Rush ☐ 100% Rush

Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	3/28/13	755	Christen Waston	3/28/13	755
Christen Waller	3/28/13	1728		03/29/13	1000
Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

NOTES:

Matrix: WW - Wastewater; W - Water; S - Soil; SD - Solid; L - Liquid; A - Air Bag; C - Charcoal tube; SL - sludge; O - Oil
Container: VOA - 40 ml vial; A/G - Amber / Or Glass 1 Liter; 250 ml - Glass wide mouth; P/O - Plastic or other

Enterprise Products

ENTERPRISE PRODUCTS PARTNERS L.P.
ENTERPRISE PRODUCTS HOLDINGS LLC
(General Partner)

ENTERPRISE PRODUCTS OPERATING LLC

September 18, 2012

Return Receipt Requested
7010 1870 0001 2945 2845

Mr. Glenn von Gonten, Senior Hydrologist
Environmental Bureau
ENMRD/Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: *Supplemental Environmental Site Investigation*
K-17/K-Loop Pipeline Release Site
Enterprise Field Services, LLC
Section 23, T27N, R8W
San Juan County, New Mexico

Dear Mr. von Gonten,

Enterprise Field Services, LLC (Enterprise) is submitting the enclosed report entitled: *Supplemental Site Investigation,* dated August 21, 2012, for the above-referenced site. A condensate release occurred at a pigging station at this location during March 2010. During excavation of soils affected by this release, it was noted that deeper soils had apparently been affected by historical releases at the location. Initial investigations during 2010 indicated soil impacts to a depth of approximately 20 feet below grade.

Enterprise conducted an additional investigation during March 2012 to determine if groundwater impacts were present. A total of four soil borings and temporary monitor wells were installed during this investigation. Soil and groundwater samples obtained at one location, TSW-11, exceeded applicable OCD *Remediation Action Levels* for soils, and Water Quality Control Commission (WQCC) *Groundwater Quality Standards* for groundwater, respectively. These findings were documented in a report entitled: *Limited Site Investigation & Corrective Action Work Plan*, as submitted to the OCD in correspondence dated April 16, 2012. Due to the low concentration of dissolved-phase benzene (25 ug/L) present at one temporary well location, this report recommended obtaining additional groundwater samples from a properly constructed monitor well to verify if the applicable OCD benzene groundwater standards had been exceeded.

During July 2012, Enterprise installed a properly constructed permanent monitor well (MW-15) in the release area to verify the concentrations of groundwater constituents present. The initial sampling event indicated a groundwater benzene concentration of 76 u/L; which exceeds the WQCC standard of 10 u/L.

Enterprise will initiate routine monitoring at the site, and will proceed with corrective actions as proposed in the April 2012 *Limited Site Investigation & Corrective Action Work Plan.*

P. O. BOX 4324
HOUSTON, TX 77210-4324
713.381.6500

1100 LOUISIANA STREET
HOUSTON, TX 77002-5227
www.epplp.com

If you have any questions regarding the site, please do not hesitate to contact me at (713) 381-2286, or via email at: drsmith@eprod.com.

Sincerely,

David R. Smith, P.G.
Sr. Environmental Scientist

Rodney M. Sartor, REM
Manager, Remediation

/dep
Enclosure – *Supplemental Environmental Site Investigation*

cc: Brandon Powell, New Mexico Oil Conservation Division, Aztec, NM
Mark Kelly, Bureau of Land Management, Farmington, NM

ec: Jim Griswold – New Mexico Oil Conservation Division, Santa Fe, NM
Scott Hall – Bureau of Land Management, Farmington, NM
Chris Mitchell - Southwest Geoscience, San Antonio, TX
Kyle Summers - Southwest Geoscience, Farmington, NM

SUPPLEMENTAL ENVIRONMENTAL SITE INVESTIGATION

Property:

K-17/K-Trunk Pipeline Release
Sec 23, T27N, R8W
San Juan County, New Mexico

August 21, 2012
SWG Project No. 041015

Prepared for:

Enterprise Field Services, LLC
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Attn: Mr. David R. Smith, P.G.

Prepared by:

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SUPPLEMENTAL ENVIRONMENTAL SITE INVESTIGATION

K-17/K-Trunk Pipeline Release
Sec 23, T27N, R8W
San Juan County, New Mexico

SWG Project No. 0411015

1.0 INTRODUCTION

1.1 Site Description & Background

The Site is located in Section 23, Township 27 North, Range 8 West, in San Juan County, New Mexico. The Site consists of a pigging station utilized to collect liquids generated during pigging activities on the K-17 pipeline prior to discharge to the K-Trunk pipeline. In addition, corrosion inhibitor and methanol are injected into the K-Trunk pipeline at the Site to prevent corrosion and the freezing of liquids in the pipeline, which would limit the ability of the pig to proceed downstream during maintenance operations. Three (3) natural gas pipelines operated by Enterprise Field Services LLC (Enterprise) traverse the Site, which is surrounded by native rangeland. The objective of the supplemental site investigation activities was to further evaluate the magnitude of petroleum hydrocarbon constituents of concern (COCs) in groundwater at the Site, prior to the implementation of corrective actions.

In August 2010, LT Environmental, Inc. (LTE) advanced ten (10) soil borings (BH1 through BH10) in the vicinity of the petroleum hydrocarbon impacted soils identified during maintenance activities. The soil borings were advanced to depths ranging from 20 to 28 feet below ground surface (bgs). Based on the results of the investigation activities completed by LTE, petroleum hydrocarbon affected soils were identified in the immediate vicinity of the K-17/K-Trunk tie-in.

During March 2012, Southwest Geoscience (SWG) performed a Limited Site Investigation (LSI) at the Site (*Limited Site Investigation & Corrective Action Work Plan* – SWG. April 4, 2012). During the LSI, SWG advanced four (4) soil borings (TSW-11 through TSW-14) in the vicinity of the former pipeline release utilizing a direct push Geoprobe® drilling rig. Additionally, each of these soil borings was completed as a Temporary Sampling Well (TSW) to allow the collection of groundwater samples. Analytical results from the TSW soil samples verified that affected soils were present at the groundwater interface in the vicinity of the release, and analytical results from the groundwater samples identified groundwater impact at the source area.

A topographic map is included as Figure 1, an aerial photograph of the Site vicinity is included as Figure 2, and a Site plan is included as Figure 3 of Appendix A.

1.2 Scope of Work

The objective of the supplemental site investigation activities was to further evaluate the magnitude of petroleum hydrocarbon constituents of concern (COCs) in groundwater at the Site, prior to the implementation of corrective actions.

1.3 Standard of Care & Limitations

The findings and recommendations contained in this report represent SWG's professional opinions based upon information derived from on-Site activities and other services performed under this scope of work and were arrived at in accordance with currently acceptable professional standards. The findings were based upon analytical results provided by an independent laboratory. Evaluations of the geologic/hydrogeologic conditions at the Site for the purpose of this investigation are made from a limited number of available data points (i.e. soil borings and ground water samples) and Site wide subsurface conditions may vary from these data points. SWG makes no warranties, express or implied, as to the services performed hereunder. Additionally, SWG does not warrant the work of third parties supplying information used in the report (e.g. laboratories, regulatory agencies, or other third parties).

This report is based upon a specific scope of work requested by Enterprise Field Services, LLC. The agreement between SWG and Enterprise Field Services, LLC outlines the scope of work, and only those tasks specifically authorized by that agreement or outlined in this report were performed. This report has been prepared for the intended use of Enterprise Field Services, LLC, and any authorization for use or reliance by any other party (except a governmental entity having jurisdiction over the Site) is prohibited without the express written authorization of Enterprise Field Services, LLC. and SWG.

2.0 PERMANENT MONITORING WELL INSTALLATION

2.1 Soil Boring & Monitoring Well Installation

Prior to the implementation of corrective actions, one (1) soil boring/permanent monitoring well was advanced in the vicinity of the release source to confirm the magnitude of COCs in groundwater as proposed in the *Limited Site Investigation & Corrective Action Work Plan* (SWG. April 4, 2012). The resulting field activities were initiated on July 11, 2012 by Mr. Kyle Summers, a SWG environmental professional. One (1) soil boring (MW-15) was advanced in the vicinity of the former pipeline release, adjacent to previous soil boring TSW-11 utilizing a direct push Geoprobe® drilling rig.

Figure 3 is a Site Plan that indicates the approximate location of the soil borings in relation to pertinent land features and former soil boring/temporary sampling well locations (Appendix A).

Soil samples were collected continuously utilizing four-foot core barrel samplers to the termination depth of each soil boring. Soil samples were observed to document soil lithology, color, moisture content, and visual and olfactory evidence of petroleum hydrocarbons. Field headspace analysis was conducted by placing the portion of the soil sample designated for field screening into a plastic ziplock bag.

The plastic bag was sealed and then placed in a warm area to promote volatilization. The air above the sample, the headspace, was then evaluated using a photoionization detector (PID) capable of detecting volatile organic compounds (VOCs). The PID was calibrated utilizing an isobutylene standard prior to use in the field.

During the completion of each soil boring, an on-Site geoscientist documented the lithology encountered and constructed a continuous profile of the soil column from the surface to the boring terminus. Undisturbed soil samples from the boring location were visually inspected and logged in the field. The lithology encountered during the advancement of soil boring MW-15 included tan sandy silt from the ground surface to a depth of approximately 12 feet bgs. The sandy silt stratum was underlain by a tan silty sand to a depth of approximately 16 feet bgs. The silty sand stratum was underlain by a brown silty clay from a depth of approximately 16 to 22 feet bgs. The silty clay stratum was underlain by a tan silty clay to a depth of approximately 24 feet bgs. A tan silty sand was encountered at a depth of 24 feet bgs to the terminus of the boring at approximately 25 feet bgs. More detailed lithologic descriptions are presented on the soil boring log included in Appendix B.

Petroleum hydrocarbon odors were detected in the field in soil samples collected from soil boring MW-15. The PID readings from soil boring MW-15 ranged from below detection to 298 parts per million (ppm), with the highest reading near the groundwater interface at depths of 18 to 20 feet bgs. Due to the close proximity of former soil boring TSW-11, soil samples were not collected for laboratory analysis during the advancement of soil boring MW-15. Field screening results are presented on soil boring logs included in Appendix B.

Subsequent to advancement, the soil boring was converted to a permanent monitoring well (MW-15). The groundwater monitoring well was completed as follows:

- Installation of 10 feet of 2-inch diameter, machine slotted PVC well screen assembly with a threaded bottom plug;
- Installation of riser pipe to surface;
- Addition of graded silica sand for annular sand pack around the well screen from the bottom of the well to two feet above the top of the screen;
- Placement of hydrated bentonite pellets above the sand pack;
- Installation of a locking well cap and below-grade circular well vault.

The monitoring well was developed by surging and removing groundwater until the fluid was relatively free of fine-grained sediment.

Monitoring well construction details are presented on the soil boring/monitoring well log included in Appendix B.

2.2 Investigation Sampling Program

2.2.1 Groundwater Sampling Program

One (1) groundwater sample was collected from the permanent monitoring well. Prior to sample collection, the monitoring well was micro-purged utilizing low-flow sampling techniques. Low-flow refers to the velocity with which groundwater enters the pump intake and that is imparted to the formation pore water in the immediate

vicinity of the well screen. It does not necessarily refer to the flow rate of water discharged at the surface which can be affected by flow regulators or restrictions. Water level drawdown provides the best indication of the stress imparted by a given flow-rate for a given hydrological situation. The objective was to pump in a manner that minimizes stress (drawdown) to the system to the extent practical taking into account established Site sampling objectives. Flow rates on the order of 0.1 to 0.5 L/min were maintained during the sampling activities using dedicated sampling equipment.

The utilization of low-flow minimal drawdown techniques enables the isolation of the screened interval groundwater from the overlying stagnant casing water. The pump intake is placed within the screened interval such that the groundwater recovered is drawn in directly from the formation with little mixing of casing water or disturbance to the sampling zone.

The groundwater sample was collected once produced groundwater was consistent in color, clarity, pH, dissolved oxygen (DO), oxidation/reduction potential (ORP), temperature and conductivity.

3.0 LABORATORY ANALYTICAL PROGRAM

3.1 Laboratory Analytical Methods

The groundwater sample collected from monitoring well MW-15 was analyzed for total petroleum hydrocarbons (TPH) gasoline range organics (GRO) and diesel range organics (DRO) utilizing EPA SW-846 method #8015B and benzene, toluene, ethylbenzene and xylenes (BTEX) using EPA SW-846 method #8021B.

Laboratory results are summarized in Table 1, included in Appendix C. The executed chain-of-custody form and laboratory data sheets are provided in Appendix D.

3.2 Quality Assurance/Quality Control (QA/QC)

Non-disposable sampling equipment was cleaned using an Alconox® wash and potable water rinse prior to the beginning of the project and before the collection of each sample.

The groundwater sample was collected and placed in laboratory prepared glassware, sealed with custody tape and placed on ice in a cooler, which was secured with a custody seal. The sample cooler and completed chain-of-custody form was relinquished to Hall Environmental Analysis Laboratory (Hall) in Albuquerque, New Mexico for standard turnaround.

Hall performed the analysis of the sample under an adequate and documented quality assurance program to meet the project and data quality objectives. The laboratory's quality assurance program is generally consistent the quality standards outlined in the National Environmental Laboratory Accreditation Program, as amended. In addition, the data generated by Hall meets the intralaboratory performance standards for the selected analytical method and the performance standards are sufficient to meet the bias, precision, sensitivity, representativeness, comparability, and completeness, as specified in the project data quality objectives.

4.0 SITE CHARACTERIZATION

4.1 Geology & Hydrogeology

According to the New Mexico Bureau of Geology and Mineral Resource (Geologic Map of New Mexico 2003), the Site overlies the Nacimiento geologic formation. The Nacimiento geologic formation is a heterogeneous non-marine formation composed of sandstone, siltstone, and shale, comprised of sediment eroded from the San Juan and Brazos-Sangre de Cristo uplifts. The Paleocene-age Nacimiento Group includes the Puerco and Torrejon Formations. The lithology encountered at the Site during boring activities are composed of Quaternary alluvial deposits derived from erosion of the parent Nacimiento sandstones and siltstones which comprise the canyon walls. Based on the data collected during the completion of previous soil borings, the alluvia generally consist of brown silty sands and silty clays from the ground surface to at least 28 feet bgs.

The lithology encountered during the advancement of soil boring MW-15 included tan sandy silt from the ground surface to a depth of approximately 12 feet bgs. The sandy silt stratum was underlain by a tan silty sand with to a depth of approximately 16 feet bgs. The silty sand stratum was underlain by a brown silty clay from a depth of approximately 16 to 22 feet bgs. The silty clay stratum was underlain by a tan silty clay to a depth of approximately 24 feet bgs. A tan silty sand was encountered at a depth of 24 feet bgs to the terminus of the boring at approximately 25 feet bgs. More detailed lithologic descriptions are presented on the soil boring log included in Appendix B.

The major aquifer underlying the Site vicinity is listed as the Colorado Plateaus Aquifer, which is made up of four smaller aquifers, the Uinta-Animas, the Mesa Verde, the Dakota-Glen, and the Coconino-De Chelly. The Uinta-Animas is the shallowest of these aquifers, and is present in the San Juan Basin. The general composition of the aquifers is moderately to well-consolidated sedimentary rocks of an age ranging from Permian to Tertiary. Each aquifer is separated from the others by an impermeable confining unit. Two of the confining units are completely impermeable and cover the entire area of the aquifers. The other two confining units are less extensive and are thinner. These units allow water to flow between the principal aquifers. There are countless streams, rivers, and lakes that overlay the Colorado Plateaus Aquifers. The surface water bodies in this region provide a place for the aquifers to discharge. Some of the high altitude rivers and lakes may also provide recharge.

The initial groundwater-bearing unit (GWBU) at the Site was encountered at a depth of approximately 19 feet bgs during the investigation activities.

4.2 Site Ranking

In accordance with the New Mexico Oil Conservation Division's (OCD's) *Guidelines for Remediation of Leaks, Spills and Releases*, SWG utilized the general site characteristics to determine the appropriate "ranking" for the Site. The ranking criteria and associated scoring are provided in the table below:

Ranking Criteria			Ranking Score
Depth to Groundwater	<50 feet	20	20
	50 to 99 feet	10	
	>100 feet	0	
Wellhead Protection Area • <1,000 feet from a water source, or; <200 feet from private domestic water source.	Yes	20	0
	No	0	
Distance to Surface Water Body	<200 feet	20	10
	200 to 1,000 feet	10	
	>1,000 feet	0	
Total Ranking Score			30

Based on SWG's evaluation of the scoring criteria, the Site would have a Total Ranking Score of **30**. This ranking is based on the following:

- The depth to the initial groundwater-bearing zone is <50 feet at the Site.
- Largo wash, which is approximately 550 feet north of the Site, drains into the San Juan River and is the nearest surface water feature.

Based on a Total Ranking Score of 30, the *Remediation Action Levels* (RALs) for soil at the Site are: 10 mg/Kg for benzene, 50 mg/Kg for total BTEX and 100 mg/Kg for TPH GRO/DRO.

In addition, the Water Quality Control Commission (WQCC) *Groundwater Quality Standards* (GQSs) for groundwater are: 0.010 mg/L for benzene, 0.75 mg/L for toluene, 0.75 mg/L for ethylbenzene, and 0.62 mg/L for total xylenes.

5.0 DATA EVALUATION

The Site is subject to regulatory oversight by the New Mexico Energy, Minerals and Natural Resources Department (EMNRD) OCD. To address activities related to crude oil/condensate related releases, the New Mexico EMNRD OCD utilizes the *Guidelines for Remediation of Leaks, Spills and Releases* as guidance, in addition to the EMNRD/OCD rules, specifically New Mexico Administrative Code (NMAC) 19.15.30 Remediation. These guidance documents establish investigation and abatement action requirements for sites subject to reporting and/or corrective action.

5.1 Groundwater

SWG compared BTEX concentrations or reporting limits (RLs) associated with the groundwater sample collected from monitoring well MW-15 to the WQCC *Groundwater Quality Standards*.

The results of the groundwater sample analysis are summarized in Table 1 of Appendix C.

Total Petroleum Hydrocarbons

The groundwater sample collected from monitoring well MW-15 exhibited a TPH GRO/DRO concentration of 1.3 mg/L.

Benzene, Toluene, Ethylbenzene, and Xylenes

The groundwater sample collected from monitoring well MW-15 exhibited a benzene concentration of 76 µg/L, which exceeds the WQCC ***Groundwater Quality Standard*** of 10 µg/L.

The groundwater sample collected from monitoring well MW-15 exhibited a toluene concentration of 150 µg/L, which is below the WQCC *Groundwater Quality Standard* of 750 µg/L.

The groundwater sample collected from monitoring well MW-15 exhibited an ethylbenzene concentration of 10 µg/L, which is below the WQCC *Groundwater Quality Standard* of 750 µg/L.

The groundwater sample collected from monitoring well MW-15 exhibited a total xylenes concentration of 200 µg/L, which is below the WQCC *Groundwater Quality Standard* of 620 µg/L.

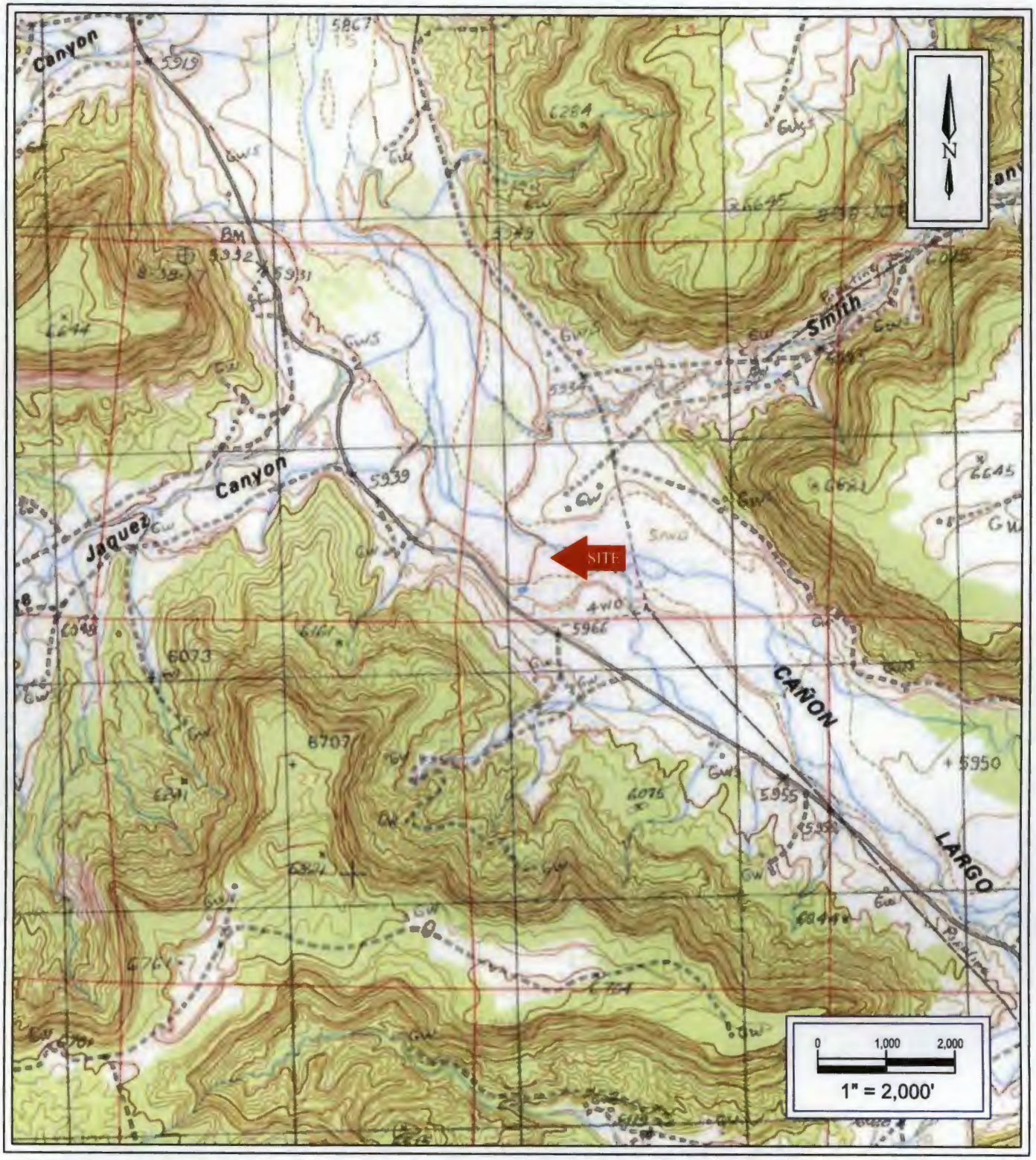
Figure 4 is a *Groundwater Quality Standard* Exceedance Zone Map that indicates the approximate distribution of benzene in relation to pertinent land features (Appendix A).

6.0 FINDINGS

The Site is located in Section 23, Township 27 North, Range 8 West, in San Juan County, New Mexico. The Site consists of a pigging station utilized to collect liquids generated during pigging activities on the K-17 pipeline prior to discharge to the K-Trunk pipeline. In addition, corrosion inhibitor and methanol are injected into the K-Trunk pipeline at the Site to prevent corrosion and the freezing of liquids in the pipeline, which would limit the ability of the pig to proceed downstream during maintenance operations. Three (3) natural gas pipelines operated by Enterprise Field Services LLC (Enterprise) traverse the Site, which is surrounded by native rangeland. The objective of the supplemental site investigation activities was to further evaluate the magnitude of petroleum hydrocarbon constituents of concern (COCs) in groundwater at the Site, prior to the implementation of corrective actions.

- Based on laboratory analysis, the groundwater sample collected from monitoring well MW-15 exhibited a benzene concentration of 76 µg/L which exceeds the WQCC *Groundwater Quality Standard* of 10 µg/L.

Based on the results of supplemental site investigation activities, the initial groundwater bearing unit does appear to be affected by a release of petroleum hydrocarbon COC above the New Mexico WQCC ***Groundwater Quality Standards***. Therefore, SWG recommends Enterprise proceed with the corrective actions described in the ***Limited Site Investigation & Corrective Action Work Plan*** – SWG April 4, 2012.



K-17/K Trunk Release
S23 T27N R8W
N36.552209°; W107.652894°
San Juan County, New Mexico

SWG Project No. 0411015

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Figure 1

USGS Topographic Map
Fresno Canyon, NM Quadrangle
Contour Interval = 20 Feet
1985

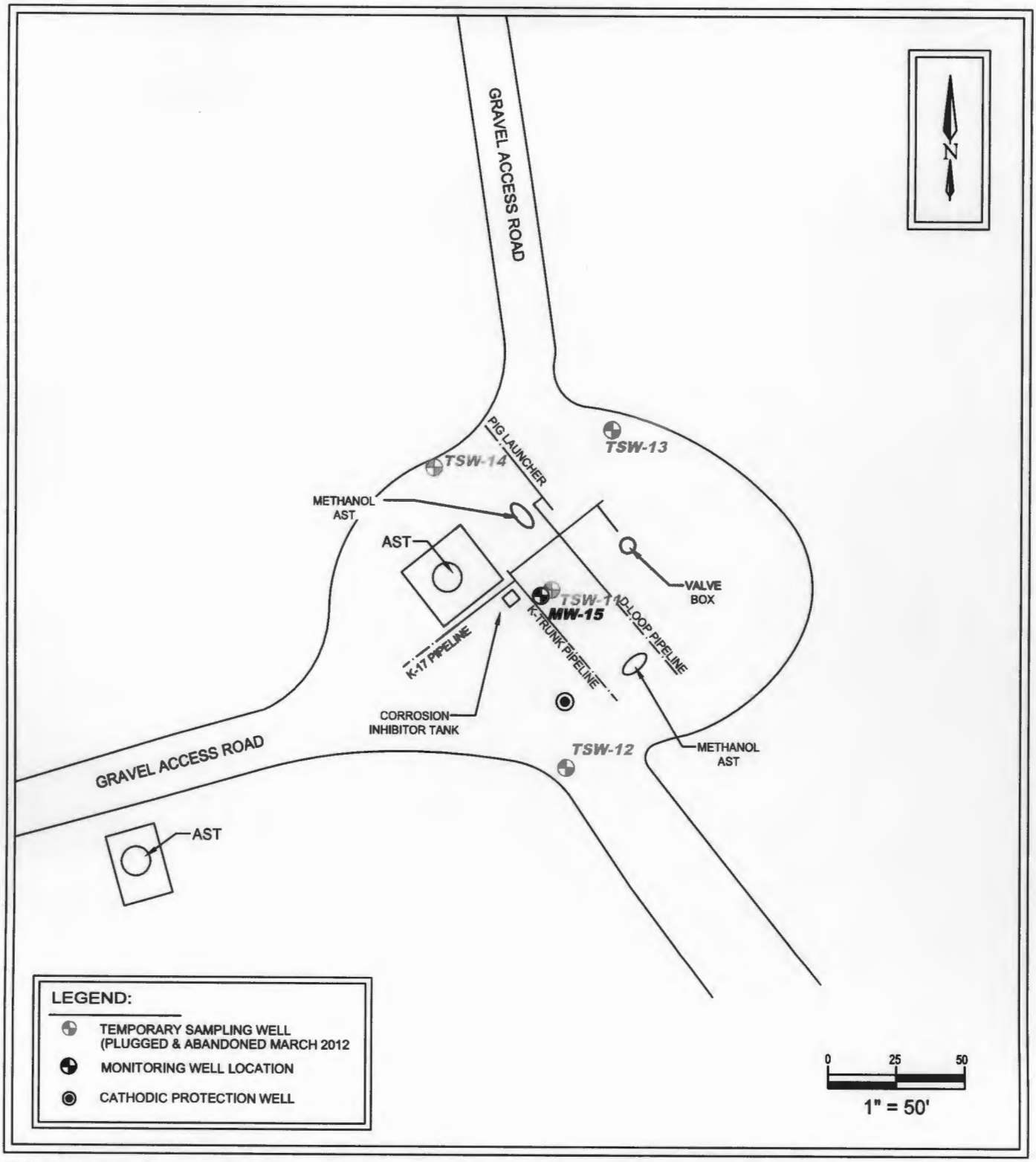
K-17/K Trunk Release
S23 T27N R8W
N36.552209°; W107.652894°
San Juan County, New Mexico

SWG Project No. 0411015

Southwest GEOSCIENCE

Figure 2

Site Vicinity Map



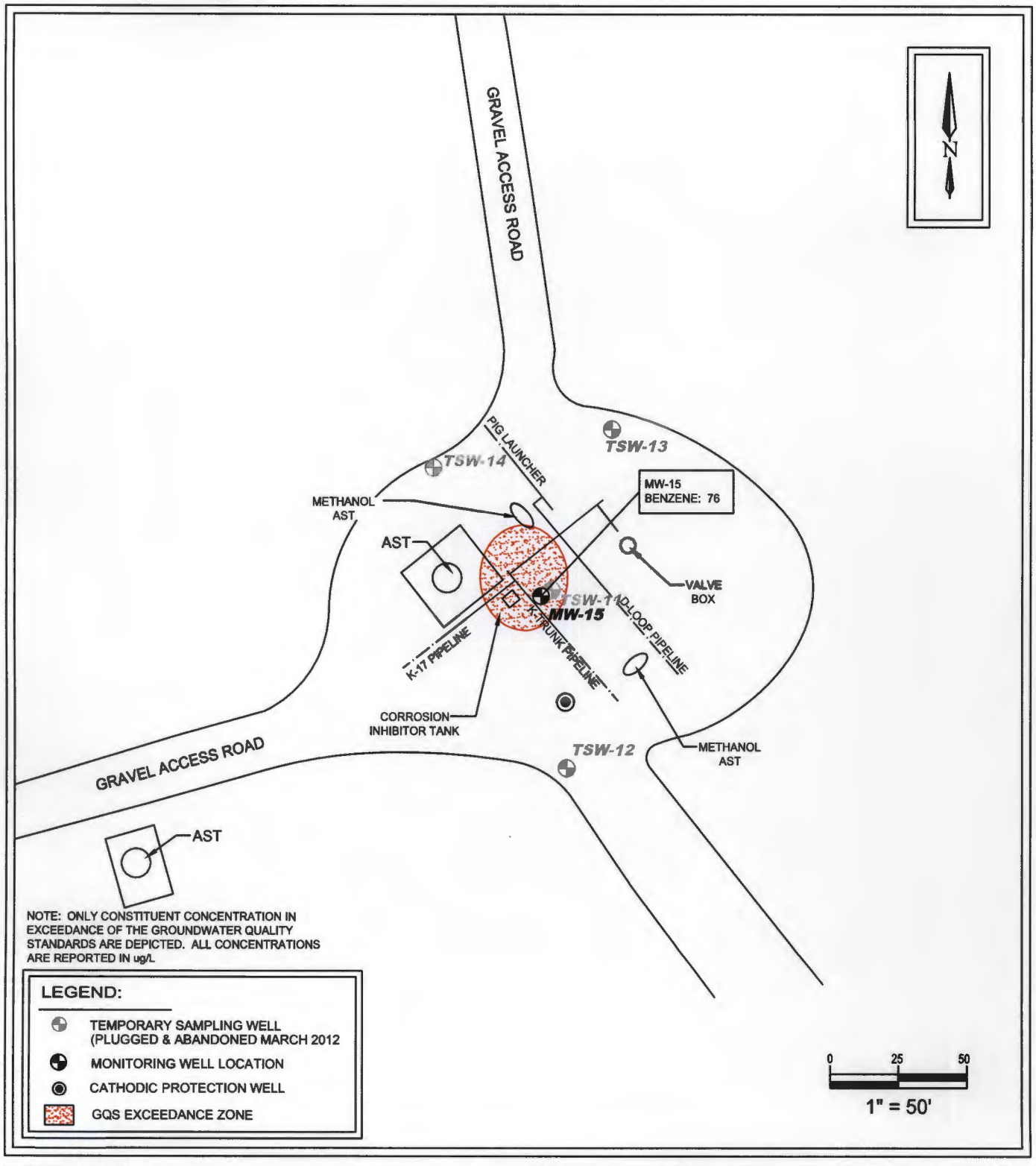
K-17/K Trunk Release
S23 T27N R8W
N36.552209°; W107.652894°
San Juan County, New Mexico

SWG Project No. 0411015

Southwest GEOSCIENCE

Figure 3

Site Map



K-17/K Trunk Release
S23 T27N R8W
N36.552209°; W107.652894°
San Juan County, New Mexico

SWG Project No. 0411015

Southwest GEOSCIENCE

Figure 4

Groundwater Quality Standard (GQS) Exceedance Zone in Groundwater

Sample Date: 7.23.2012

Client: Enterprise Field Services LLC
Project Name: K-17/K-Trunk Release
Project Location: CR 4990/379 Rio Arriba County
Project Manager: Kyle Summers

MONITORING WELL LOG

DRILLING & SAMPLING INFORMATION

Soil Boring / Monitoring Well Number: MW-15
Date Started: 7.11.12
Project #: 0411015
Date Completed: 7.11.12
Drawn By: RDH
Drilling Company: Earthworx
Approved By: KS
Driller: Louis Trujillo
Geologist: K. Summers
Well Diam: 2"
Boring Method: Geoprobe
Screen Size: 0.010"
Bore Hole Dia: 3.25"
Screen Length: 10'
Casing Length: 15'

BORING METHOD
HSA - HOLLOW STEM AUGERS
CFA - CONTINUOUS FLIGHT AUGERS
GP - GEOPROBE
AR - AIR ROTARY

SAMPLER TYPE
CB - FIVE FOOT CORE BARREL
SS - DRIVEN SPLIT SPOON
ST - PRESSED SHELBY TUBE

GROUNDWATER DEPTH
▽ AT COMPLETION
▼ AT WELL STABILIZATION

Monitor well Detail	SOIL CLASSIFICATION SURFACE ELEVATION:	Stratum Depth	Depth Scale	Sample No.	Sample Interval	% Recovery	Groundwater Depth	FID/PID Readings (ppm)	BORING AND SAMPLING NOTES
	SANDY SILT, Tan, Dry, No Odor		5			100%		2	
								2	
						100%		3	
			10					3	
						100%		2	
								2	
	SILTY SAND, Tan, Dry, No Odor					100%		2	
			15					2	
	SILTY CLAY, Brown, Dry to Moist, Hydrocarbon Odor					100%		78	
							▼	298	
			20					20	
	SILTY CLAY, Tan, Wet, Hydrocarbon Odor					100%		6	
	SILTY SAND, Tan, Wet, No Odor							4	
	Bottom of Boring @ 25 ft bgs		25						
			30						

NOTE: This log is not to be used outside of the original report.

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APPENDIX C

Table

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TABLE 1
K-17/K-TRUNK PIPELINE RELEASE
GROUNDWATER ANALYTICAL SUMMARY

Sample I.D.	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	TPH GRO (mg/L)	TPH DRO (mg/L)
New Mexico Water Quality Control Commmission Groundwater Quality Standards		10	750	750	620	NE	NE
TSW-11	3.21.12	**25**	75	11	120	0.83	<1.0
TSW-12	3.21.12	<2.0	<2.0	<2.0	<4.0	<0.10	<1.0
TSW-13	3.21.12	<2.0	<2.0	<2.0	<4.0	<0.10	<1.0
TSW-14	3.21.12	<2.0	<2.0	<2.0	<4.0	<0.10	<1.0
MW-15	7.23.12	**76**	150	10	200	1.3	<1.0

Note: Concentrations in **bold** and yellow exceed the applicable OCD Remediation Action Level

NA = Not Analyzed

NE = Not Established

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APPENDIX D

Laboratory Data Sheets & Chain of Custody Documentation

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

August 02, 2012

Kyle Summers
Southwest Geoscience
606 S. Rio Grande Unit A
Aztec, NM 87410
TEL: (214) 350-5469
FAX (214) 350-2914

RE: K-17 OrderNo.: 1207B00

Dear Kyle Summers:

Hall Environmental Analysis Laboratory received 1 sample(s) on 7/25/2012 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1207B00**
Date Reported: **8/2/2012**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Southwest Geoscience
Client Sample ID: MW-15
Project: K-17
Collection Date: 7/23/2012 2:05:00 PM
Lab ID: 1207B00-001
Matrix: AQUEOUS
Received Date: 7/25/2012 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE						Analyst: **JMP**
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	7/27/2012 9:25:54 AM
Surr: DNOP	117	79.5-166		%REC	1	7/27/2012 9:25:54 AM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	1.3	0.050		mg/L	1	7/26/2012 6:38:22 PM
Surr: BFB	113	69.8-119		%REC	1	7/26/2012 6:38:22 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	76	1.0		µg/L	1	7/26/2012 6:38:22 PM
Toluene	150	10		µg/L	10	7/27/2012 4:06:10 PM
Ethylbenzene	10	1.0		µg/L	1	7/26/2012 6:38:22 PM
Xylenes, Total	200	2.0		µg/L	1	7/26/2012 6:38:22 PM
Surr: 4-Bromofluorobenzene	105	55-140		%REC	1	7/26/2012 6:38:22 PM

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	U	Samples with CalcVal < MDL

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1207B00**

02-Aug-12

Client: Southwest Geoscience

Project: K-17

Sample ID **MB-3044**	SampType: **MBLK**	TestCode: **EPA Method 8015B: Diesel Range**
Client ID: **PBW**	Batch ID: **3044**	RunNo: **4457**
Prep Date: **7/26/2012**	Analysis Date: **7/27/2012**	SeqNo: **124543** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	1.0								
Surr: DNOP	1.1		1.000		113	79.5	166			

Sample ID **LCS-3044**	SampType: **LCS**	TestCode: **EPA Method 8015B: Diesel Range**
Client ID: **LCSW**	Batch ID: **3044**	RunNo: **4457**
Prep Date: **7/26/2012**	Analysis Date: **7/27/2012**	SeqNo: **124598** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	4.4	1.0	5.000	0	88.6	74	157			
Surr: DNOP	0.46		0.5000		91.4	79.5	166			

Sample ID **LCSD-3044**	SampType: **LCSD**	TestCode: **EPA Method 8015B: Diesel Range**
Client ID: **LCSS02**	Batch ID: **3044**	RunNo: **4457**
Prep Date: **7/26/2012**	Analysis Date: **7/27/2012**	SeqNo: **124599** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	4.3	1.0	5.000	0	85.5	74	157	3.53	23	
Surr: DNOP	0.44		0.5000		88.6	79.5	166	0	0	

Qualifiers:

- */X Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- R RPD outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1207B00**

02-Aug-12

Client: Southwest Geoscience

Project: K-17

Sample ID **5ML RB**	SampType: **MBLK**	TestCode: **EPA Method 8015B: Gasoline Range**
Client ID: **PBW**	Batch ID: **R4462**	RunNo: **4462**
Prep Date:	Analysis Date: **7/26/2012**	SeqNo: **124647** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	18		20.00		88.3	69.8	119			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015B: Gasoline Range**
Client ID: **LCSW**	Batch ID: **R4462**	RunNo: **4462**
Prep Date:	Analysis Date: **7/26/2012**	SeqNo: **124648** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.53	0.050	0.5000	0	105	75.9	119			
Surr: BFB	17		20.00		84.4	69.8	119			

Sample ID **5ML RB**	SampType: **MBLK**	TestCode: **EPA Method 8015B: Gasoline Range**
Client ID: **PBW**	Batch ID: **R4480**	RunNo: **4480**
Prep Date:	Analysis Date: **7/27/2012**	SeqNo: **125476** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	19		20.00		95.1	69.8	119			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015B: Gasoline Range**
Client ID: **LCSW**	Batch ID: **R4480**	RunNo: **4480**
Prep Date:	Analysis Date: **7/27/2012**	SeqNo: **125477** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	24		20.00		122	69.8	119			S

Sample ID **1207B00-001AMS**	SampType: **MS**	TestCode: **EPA Method 8015B: Gasoline Range**
Client ID: **MW-15**	Batch ID: **R4480**	RunNo: **4480**
Prep Date:	Analysis Date: **7/27/2012**	SeqNo: **125480** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	24		20.00		118	69.8	119			

Sample ID **1207B00-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015B: Gasoline Range**
Client ID: **MW-15**	Batch ID: **R4480**	RunNo: **4480**
Prep Date:	Analysis Date: **7/27/2012**	SeqNo: **125481** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	23		20.00		116	69.8	119	0	0	

Qualifiers:

- */X Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- R RPD outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RL Reporting Detection Limit

QC SUMMARY REPORT

WO#: **1207B00**

Hall Environmental Analysis Laboratory, Inc.

02-Aug-12

Client: Southwest Geoscience
Project: K-17

Sample ID **5ML RB**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBW**	Batch ID: **R4462**	RunNo: **4462**
Prep Date:	Analysis Date: **7/26/2012**	SeqNo: **124682** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	17		20.00		83.0	55	140			

Sample ID **100NG BTEX LCS**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSW**	Batch ID: **R4462**	RunNo: **4462**
Prep Date:	Analysis Date: **7/26/2012**	SeqNo: **124683** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	104	80	120			
Ethylbenzene	21	1.0	20.00	0	105	80	120			
Xylenes, Total	65	2.0	60.00	0	109	80	120			
Surr: 4-Bromofluorobenzene	18		20.00		88.0	55	140			

Sample ID **1207B39-001AMS**	SampType: **MS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **BatchQC**	Batch ID: **R4462**	RunNo: **4462**
Prep Date:	Analysis Date: **7/26/2012**	SeqNo: **124685** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	110	5.0	100.0	0	110	70.1	118			
Ethylbenzene	110	5.0	100.0	0.6900	106	73.5	117			
Xylenes, Total	330	10	300.0	0	109	73.1	119			
Surr: 4-Bromofluorobenzene	86		100.0		86.1	55	140			

Sample ID **1207B39-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **BatchQC**	Batch ID: **R4462**	RunNo: **4462**
Prep Date:	Analysis Date: **7/26/2012**	SeqNo: **124686** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	110	5.0	100.0	0	107	70.1	118	2.89	16.4	
Ethylbenzene	100	5.0	100.0	0.6900	103	73.5	117	2.93	13.5	
Xylenes, Total	320	10	300.0	0	106	73.1	119	3.50	12.9	
Surr: 4-Bromofluorobenzene	96		100.0		95.8	55	140	0	0	

Sample ID **5ML RB**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBW**	Batch ID: **R4480**	RunNo: **4480**
Prep Date:	Analysis Date: **7/27/2012**	SeqNo: **125484** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	ND	1.0								
Surr: 4-Bromofluorobenzene	18		20.00		88.5	55	140			

Qualifiers:

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- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1207B00**

02-Aug-12

Client: Southwest Geoscience

Project: K-17

Sample ID **100NG BTEX LCS**	SampType: **LCS**			TestCode: **EPA Method 8021B: Volatiles**					
Client ID: **LCSW**	Batch ID: **R4480**			RunNo: **4480**					
Prep Date:	Analysis Date: **7/27/2012**			SeqNo: **125485**		Units: **µg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	22	1.0	20.00	0	112	80	120			
Surr: 4-Bromofluorobenzene	18		20.00		88.8	55	140			

Sample ID **1207B89-001AMS**	SampType: **MS**			TestCode: **EPA Method 8021B: Volatiles**					
Client ID: **BatchQC**	Batch ID: **R4480**			RunNo: **4480**					
Prep Date:	Analysis Date: **7/27/2012**			SeqNo: **125487**		Units: **µg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	200	5.0	100.0	86.13	114	72.3	117			
Surr: 4-Bromofluorobenzene	94		100.0		93.6	55	140			

Sample ID **1207B89-001AMSD**	SampType: **MSD**			TestCode: **EPA Method 8021B: Volatiles**					
Client ID: **BatchQC**	Batch ID: **R4480**			RunNo: **4480**					
Prep Date:	Analysis Date: **7/27/2012**			SeqNo: **125488**		Units: **µg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	190	5.0	100.0	86.13	107	72.3	117	3.61	13.9	
Surr: 4-Bromofluorobenzene	91		100.0		91.2	55	140	0	0	

Qualifiers:

- */X Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- R RPD outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- RL Reporting Detection Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: **Southwest Geoscience** Work Order Number: **1207B00**

Received by/date: 07/25/12

Logged By: **Ashley Gallegos** 7/25/2012 10:00:00 AM

Completed By: **Ashley Gallegos** 7/25/2012 12:56:14 PM

Reviewed By: JB 7/25/12

Chain of Custody

1. Were seals intact?	Yes	No	Not Present ✓
2. Is Chain of Custody complete?	Yes ✓	No	Not Present
3. How was the sample delivered?	Courier		

Log In

4. Coolers are present? (see 19. for cooler specific information)	Yes ✓	No	NA
5. Was an attempt made to cool the samples?	Yes ✓	No	NA
6. Were all samples received at a temperature of >0° C to 6.0°C	Yes ✓	No	NA
7. Sample(s) in proper container(s)?	Yes ✓	No	
8. Sufficient sample volume for indicated test(s)?	Yes ✓	No	
9. Are samples (except VOA and ONG) properly preserved?	Yes ✓	No	
10. Was preservative added to bottles?	Yes	No ✓	NA
11. VOA vials have zero headspace?	Yes ✓	No	No VOA Vials
12. Were any sample containers received broken?	Yes	No ✓	
13. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ✓	No	# of preserved bottles checked for pH:
14. Are matrices correctly identified on Chain of Custody?	Yes ✓	No	(<2 or >12 unless noted)
15. Is it clear what analyses were requested?	Yes ✓	No	Adjusted?
16. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ✓	No	Checked by:

Special Handling (if applicable)

17. Was client notified of all discrepancies with this order? Yes No NA ✓

Person Notified: _____ Date: _____

By Whom: _____ Via: eMail Phone Fax In Person

Regarding: _____

Client Instructions: _____

18. Additional remarks:

19. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Yes			

CHAIN OF CUSTODY RECORD

Southwest GEOSCIENCE
Environmental & Hydrogeologic Consultants

Office Location: Aztec
Project Manager: R. Summers

Laboratory: Hall
Address: ABQ
Contact: Andy Freeman
Phone:
PO/SO #:

Sampler's Name: Kyle Summers
Sampler's Signature:

Proj. No: 04111015
Project Name: R-17

Lab use only
Due Date:

Temp. of coolers when received (C°): 1.0

1 | 2 | 3 | 4 | 5

Page 1 of 1

ANALYSIS REQUESTED: BTEX 8021; TPH GRO/DRO DRO

Matrix	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	Start Depth	End Depth	No/Type of Containers: VOA	A/G 1 Lt.	250 ml	P/O	Lab Sample ID (Lab Use Only)
W	7/23/12	1405		X	MW-15			5				1207B00[illegible]-001
								NF 5				
								K 3				

Turn around time: [X] Normal [ ] 25% Rush [ ] 50% Rush [ ] 100% Rush

Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	7/24/12	1633	Christine Walters	1633	
Christine Walters	7/24/12	1724		07/25/12	1000
Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

NOTES:

Matrix: WW - Wastewater; W - Water; S - Soil; SD - Solid; L - Liquid; A - Air Bag; C - Charcoal tube; SL - sludge; O - Oil
Container: VOA - 40 ml vial; A/G - Amber / Or Glass 1 Liter; 250 ml - Glass wide mouth; P/O - Plastic or other