# 3R – 446

# 2013 AGWMR

# 05 / 06 / 2014

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May 6, 2014

**Return Receipt Requested**
**7007 0220 0000 4311 5963**

Mr. Glenn von Gonten
New Mexico Energy, Minerals & Natural Resources
Department - Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

**Re: Annual Groundwater Monitoring Report (October and December 2013 Events)**
**K-51 Pipeline Release Site**
**Off County Road 537**
**NE ¼ Section 34 & NW ¼, Sec 35, T26N, R6W**
**Rio Arriba County, New Mexico**

Dear Mr. Von Gonten:

Enterprise Field Services, LLC (Enterprise) is submitting two (2) copies and (1) electronic CD of the enclosed report entitled: *Annual Groundwater Monitoring Report (October and December 2013 Events)* for the K-51 release site. This report documents the results of the October and December 2013 groundwater monitoring events conducted at the release site. Remedial actions are being conducted at the site in response to a natural gas condensate release occurring on April 13, 2010.

During this monitoring event, dissolved-phase benzene concentrations exceeding applicable Water Quality Control Commission (WQCC) Groundwater Quality Standards were present at two monitor well locations (MW-1 and MW-19). No measurable accumulation of phase-separated hydrocarbon (PSH) was present at any monitoring location.

Groundwater constituent concentrations at this site are degrading naturally, with the exception of dissolved phase benzene concentration in monitor well MW-19. Enterprise has inspected the site to determine if an additional monitor well can be installed to delineate affected groundwater downgradient of monitor well MW-19. Site work is currently being performed to repair erosional areas over the pipeline at this location, and an access area to install an addition well will be constructed.

Enterprise will continue routine groundwater monitor events, and evaluate whether additional remedial actions are necessary to complete site closure. If you have any questions concerning the enclosed report, 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

Gregory E. Miller, P.G.
Supervisor, Environmental

/dep
Enclosures (2)

cc: Brandon Powell - New Mexico Oil Conservation Division, Aztec, NM
Bill Liess - Bureau of Land Management, Farmington, NM

ec: Jim Griswold – New Mexico Oil Conservation Division, Santa Fe, NM
Sherrie Landon – Bureau of Land Management, Farmington, NM
Liz Scaggs - Apex TITAN Inc., (formerly Southwest Geoscience), Dallas, TX
Kyle Summers – Apex TITAN Inc. (formerly Southwest Geoscience), Farmington, NM

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Sent Mr. Glenn von Gonten
Street or PO New Mexico Energy, Minerals & Natural Resources
Department - Oil Conservation Division
City, 1220 South St. Francis Drive
Santa Fe, New Mexico 87505

PS Form 3800, August 2006 See Reverse for Instructions

K-51 Pipeline Release site

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Mr. Glenn von Gonten
New Mexico Energy, Minerals & Natural Resources
Department - Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

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# ANNUAL GROUNDWATER MONITORING REPORT
(October 2013 and December 2013 Events)

Property:

K-51 Pipeline Release (3R-206)
Sections 34 and 35, T26N, R6W
Rio Arriba County, New Mexico
SWG Project No. 0410G003
February 7, 2014

Prepared for:
Enterprise Field Services, LLC
P.O. Box 4324
Houston, Texas 77210-4324
Attention: Mr. David R. Smith, P.G.


PREPARED BY:

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Manager, Four Corners Office

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# ANNUAL GROUNDWATER MONITORING REPORT
# (October 2013 and December 2013 Events)

## 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 (latitude 36.4465° North, longitude 107.4461° West), 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, tank, or pit may have been a historic source of petroleum hydrocarbon impact to groundwater (OCD reference 3R-206, El Paso Natural Gas, Final Pit Closure) 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

Quarterly groundwater sampling events were conducted during October and December of 2013 by Aaron Bryant and Joseph Doyle, SWG environmental professionals. Prior to October 2013, sampling events were reported to the OCD individually on a quarterly basis.

SWG's groundwater sampling program consisted of the following:

- Collection of one groundwater sample from each monitoring well utilizing low-flow sampling techniques.

Please note, due to the depth of groundwater at monitoring well MW-20, which exceeds the lift capability of the peristaltic pump, monitoring well MW-20 was purged and sampled utilizing a disposable bailer. In addition, due to insufficient groundwater recharge, monitoring well MW-18 was not sampled during these events. Monitoring well MW-18 is almost completely silted in.

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 October and December 2013 gauging activities.

Prior to sample collection, each of the monitoring wells (with the exception of monitoring wells MW-18 and 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. Monitoring well MW-18 was not sampled due to inadequate groundwater generation (well silted in).

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 events 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 per-event 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 the October and December 2013 monitoring events averages approximately 0.009 ft/ft across the Site.

Groundwater measurements collected during the most recent gauging events are presented with TOC elevations in Table 2, Appendix B. A groundwater gradient map depicting the most recent gauging data is included as Figures 4A and 4B (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 October 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. Groundwater Quality Exceedance Zone maps are provided as Figures 5A and 5B of Appendix A.

### October 2013:

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, and MW-20 during the October 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 October 2013 sampling event exhibited benzene concentrations of 39 µg/L and 140 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 October 2013 sampling event.

The groundwater samples collected from monitoring wells MW-1, MW-4, and MW-19 exhibited TPH GRO concentrations ranging from 0.13 mg/L to 0.51 mg/L. The highest GRO concentration during the October 2013 sampling event was observed in the groundwater sample from monitoring well MW-19.

The groundwater sample collected from monitoring well MW-19 exhibited a TPH DRO concentration of 2.1 mg/L.

### December 2013:

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, and MW-20 during the December 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 December 2013 sampling event exhibited benzene concentrations of 10 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 December 2013 sampling event.

The groundwater samples collected from monitoring wells MW-1, MW-4, and MW-19 exhibited TPH GRO concentrations ranging from 0.18 mg/L to 1.4 mg/L. The highest GRO concentration during the December 2013 sampling event was observed in the groundwater sample from monitoring well MW-19.

The groundwater sample collected from monitoring well MW-19 during the December 2013 sampling event exhibited a TPH DRO concentration of 4.2 mg/L.

## 6.0 FINDINGS

SWG conducted quarterly groundwater monitoring events at the K-51 Pipeline release site during October and December of 2013. 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 groundwater recharge (well silted in). An attempt will be made to redevelop monitoring well MW-18. Monitoring well MW-18 has not exhibited detectable concentrations of COCs in the past and is up/cross gradient to the COC plume. No recommendation will be made to replace this monitoring well if redevelopment attempts are unsuccessful.

- 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, and MW-20 during the October and December 2013 sampling events did not exhibit benzene, toluene, ethylbenzene or xylenes concentrations above the respective WQCC *Groundwater Quality Standards*.

- **The groundwater samples collected from monitoring wells MW-1 and MW-19 during the October and December 2013 sampling events exhibited benzene concentrations ranging from 10 µg/L to 160 µg/L, which exceed the WQCC *Groundwater Quality Standard* of 10 µg/L.**

- COC concentrations at monitoring well MW-14 returned to pre-June 2013 "non-detect" levels, and COC concentrations at monitoring well MW-19 returned to the pre-June concentration levels.

- **With the exception of monitoring well MW-19, sampling events at the site have exhibited steadily decreasing COC concentrations. In the source area**

of the release, concentrations have decreased by two (2) orders of magnitude, and only monitoring wells MW-19 and MW-1 continue to exhibit COC concentrations above the WQCC *Groundwater Quality Standards*.

## 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;
- Install a monitoring well down-gradient of monitoring well MW-19.
- Additional in situ chemical oxidation was previously recommended in the *Supplemental Site Investigation & Corrective Action Work Plan* (SWG-April 23, 2012). However, due to the continual decrease in COC concentrations at the Site, SWG recommends evaluating groundwater conditions after the installation of the new down-gradient monitoring well prior to performing additional remediation activities.

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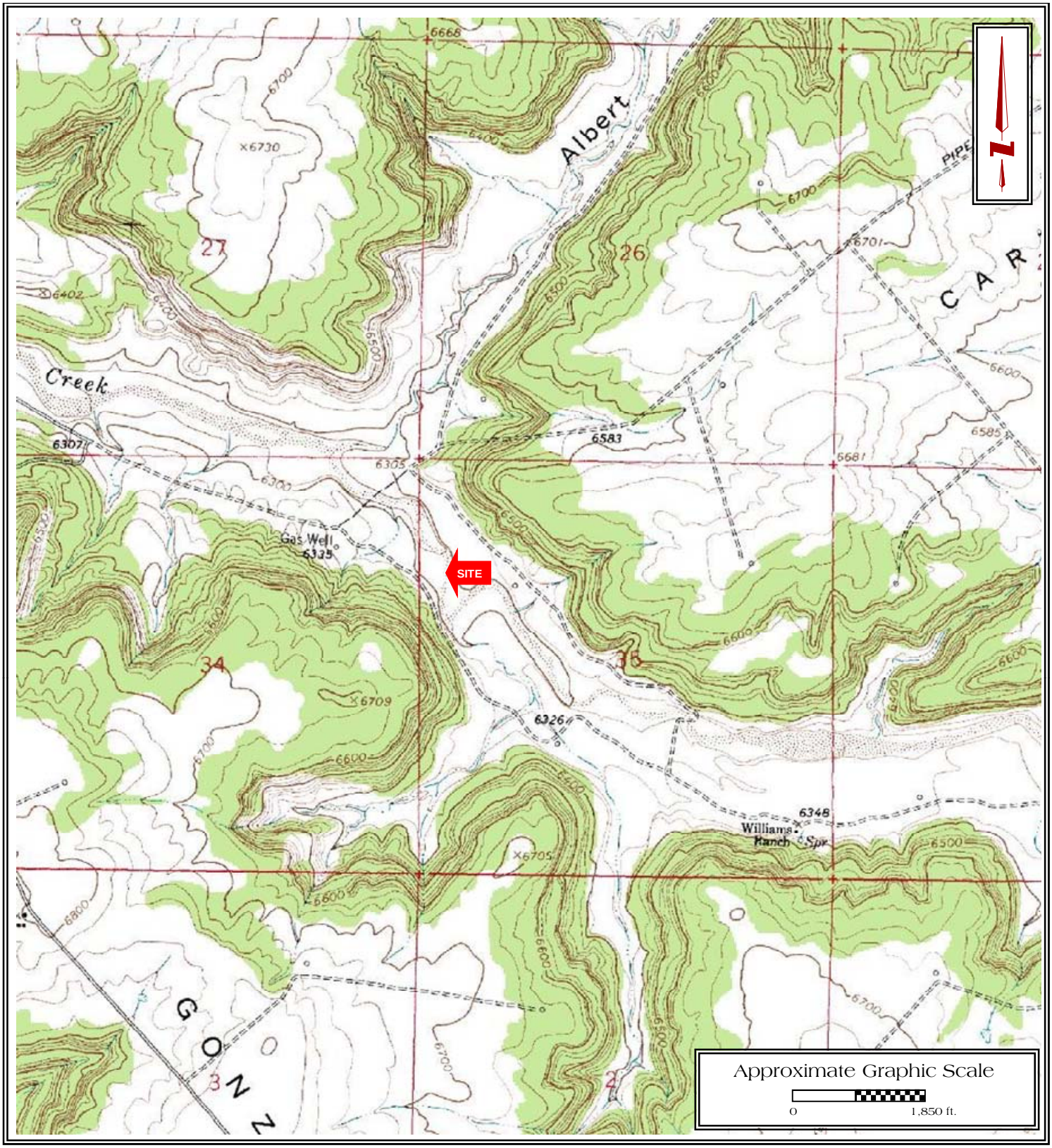
# APPENDIX A

## Figures




**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

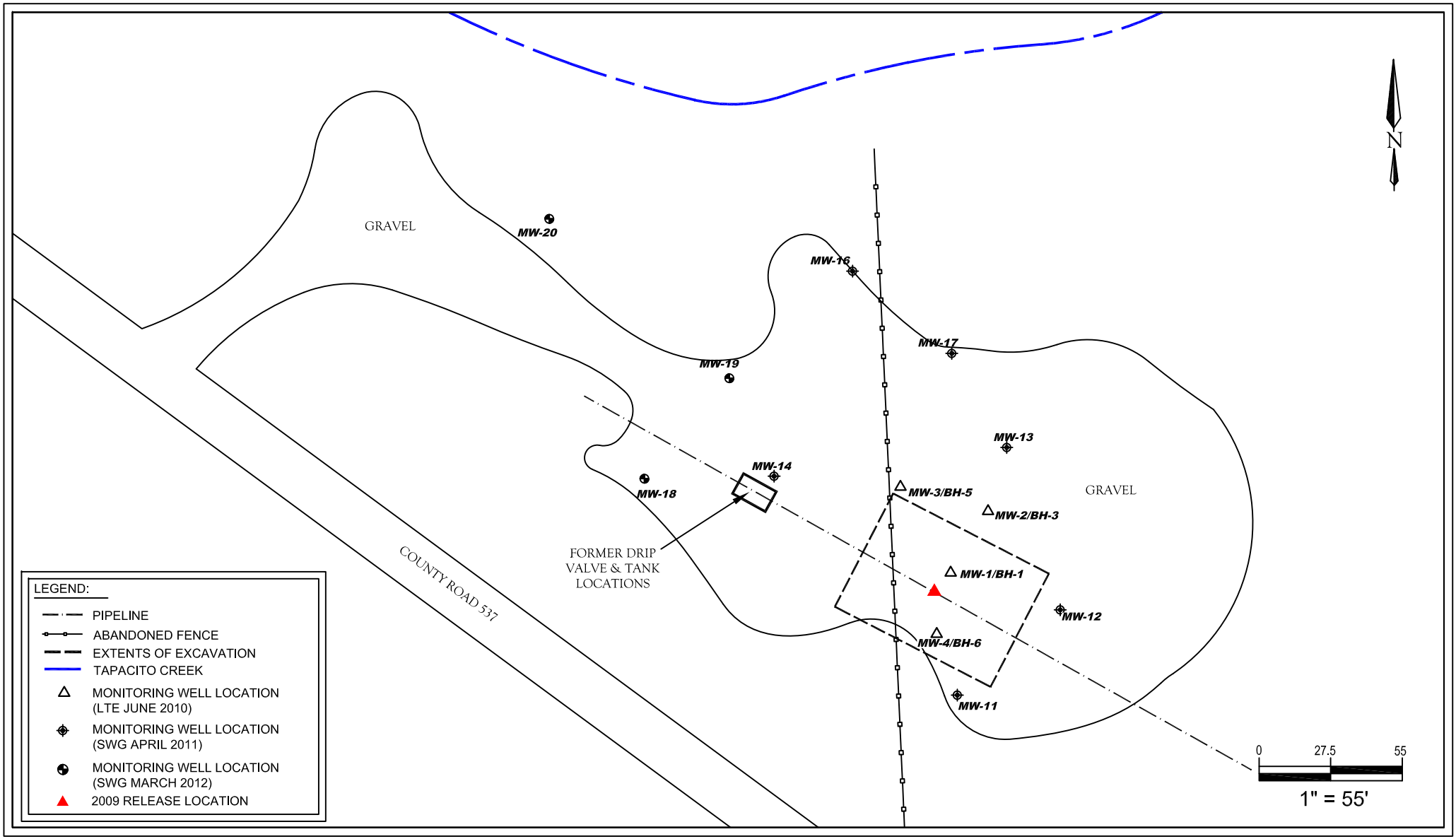


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FIGURE 3

SITE MAP

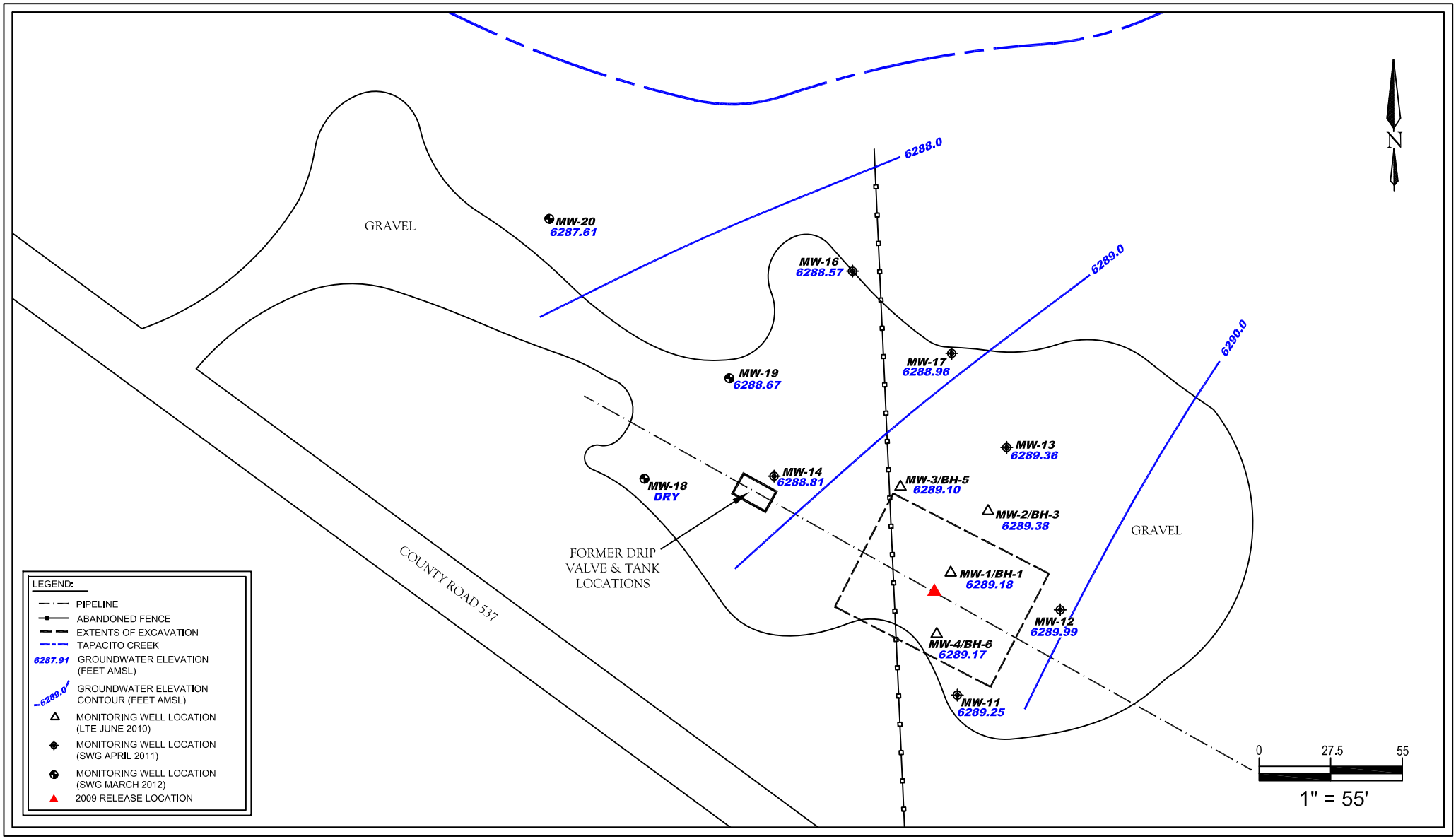


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FIGURE 4A

GROUNDWATER GRADIENT MAP

OCTOBER 2013

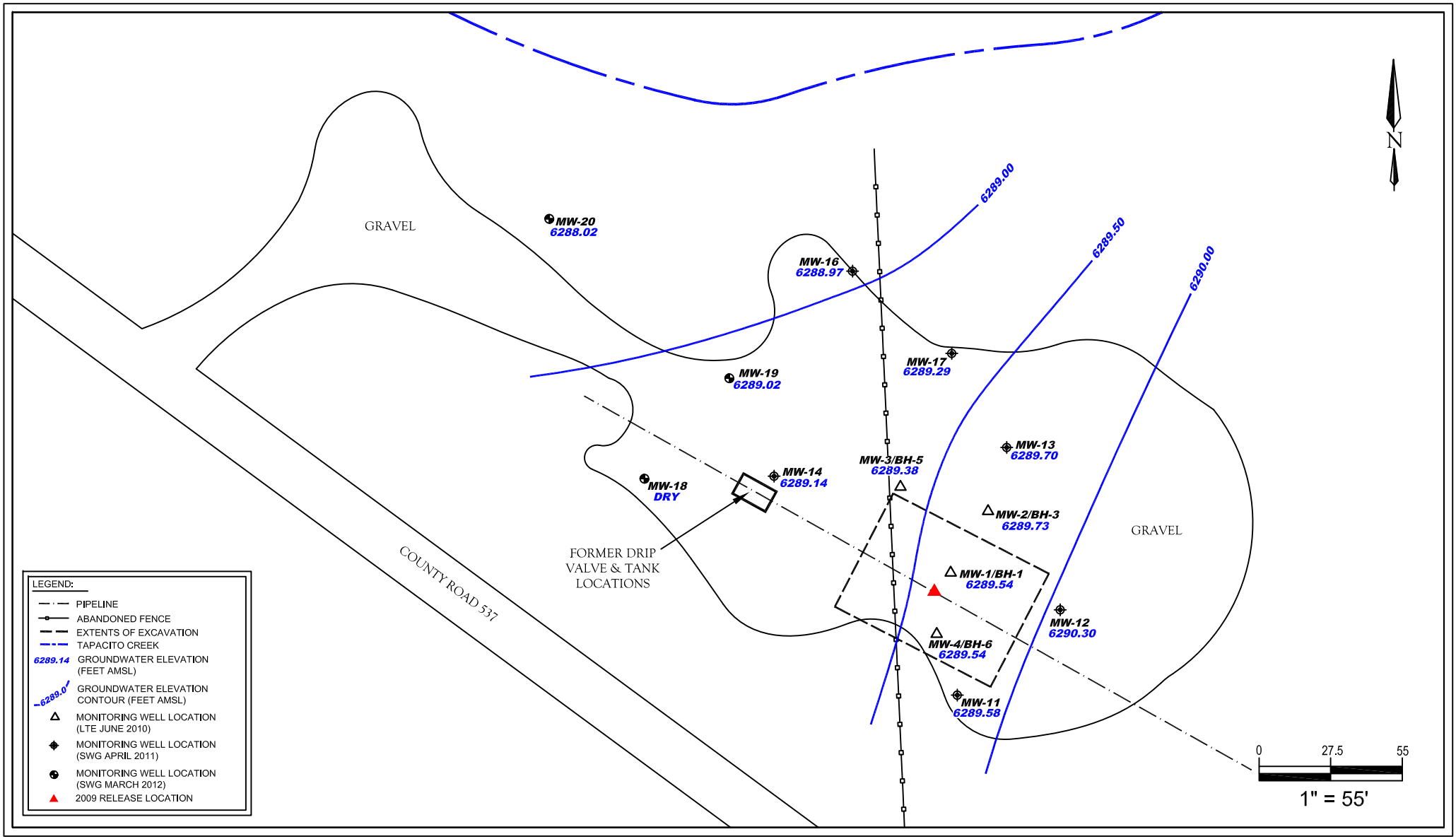


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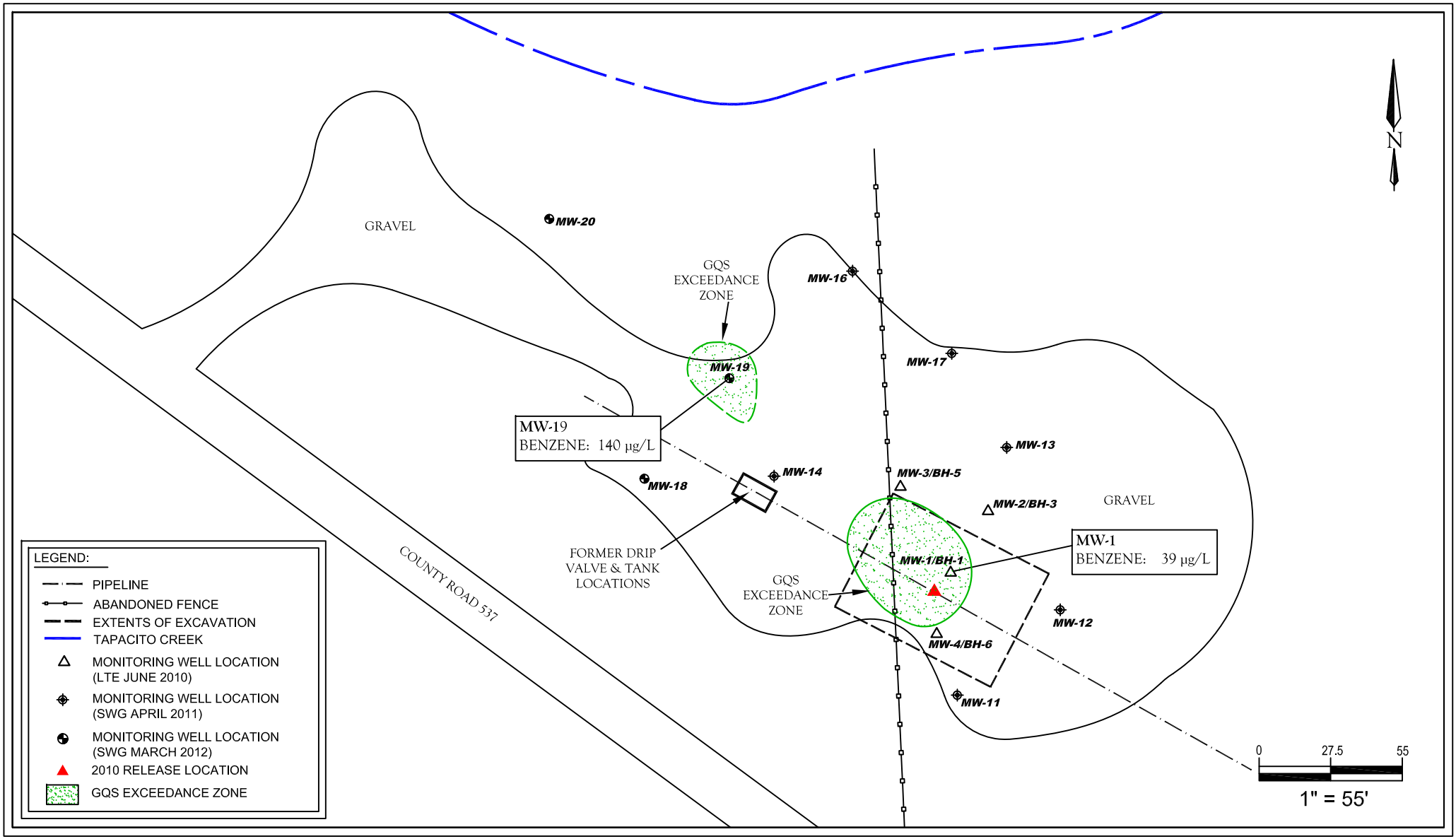
FIGURE 4B

GROUNDWATER GRADIENT MAP

DECEMBER 2013

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SWG Project No. 0410003

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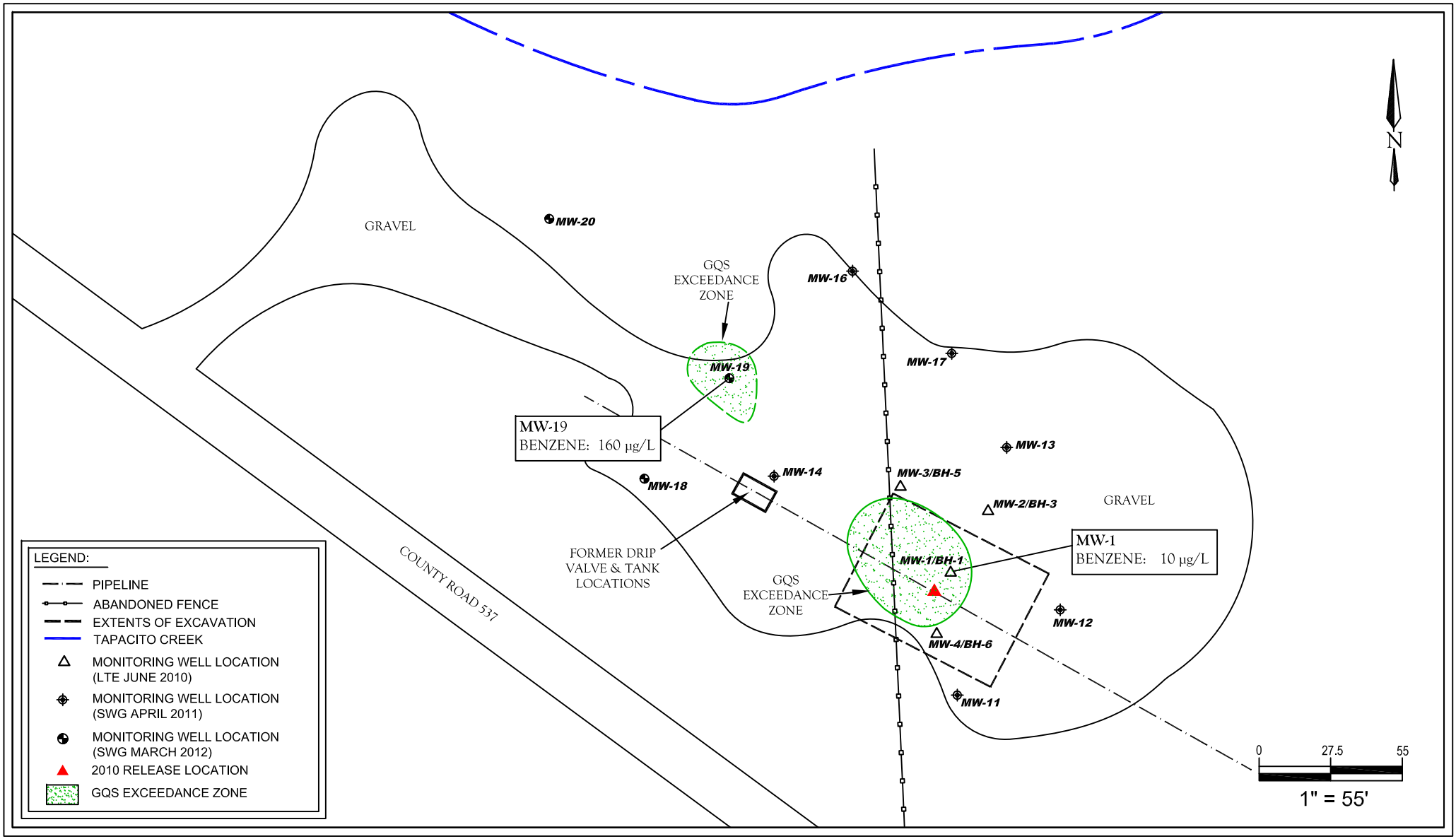
FIGURE 5A

GROUNDWATER QUALITY
STANDARD EXCEEDANCE ZONE
OCTOBER 2013




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

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FIGURE 5B

GROUNDWATER QUALITY
STANDARD EXCEEDANCE ZONE
DECEMBER 2013

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# APPENDIX B

## Tables

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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 |
| | 6.27.13 | **24** | <1.0 | <1.0 | 36 | 0.22 | <1.0 |
| | 10.22.13 | **39** | <1.0 | 24 | 13 | 0.23 | <1.0 |
| | 12.16.13 | **10** | <1.0 | 14 | 11 | 0.18 | <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 |
| | 6.27.13 | <1.0 | <1.0 | <1.0 | <2.0 | <0.050 | <1.0 |
| | 10.21.13 | <1.0 | <1.0 | <1.0 | <2.0 | <0.050 | <1.0 |
| | 12.13.13 | <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-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 |
| | 6.27.13 | <1.0 | <1.0 | <1.0 | <2.0 | <0.050 | <1.0 |
| | 10.21.13 | <1.0 | <1.0 | <1.0 | <2.0 | <0.050 | <1.0 |
| | 12.13.13 | <1.0 | <1.0 | <1.0 | <2.0 | <0.050 | <1.0 |
| 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 |
| | 6.27.13 | 3.9 | <1.0 | 61 | 60 | 1.3 | <1.0 |
| | 10.22.13 | <1.0 | <1.0 | 12 | 3.8 | 0.13 | <1.0 |
| | 12.13.13 | <1.0 | <1.0 | 16 | 6.2 | 0.4 | <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-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 |
| | 6.27.13 | <1.0 | <1.0 | <1.0 | <2.0 | <0.050 | <1.0 |
| | 10.21.13 | <1.0 | <1.0 | <1.0 | <2.0 | <0.050 | <1.0 |
| | 12.13.13 | <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 |
| | 6.27.13 | <1.0 | <1.0 | <1.0 | <2.0 | <0.050 | <1.0 |
| | 10.21.13 | <1.0 | <1.0 | <1.0 | <2.0 | <0.050 | <1.0 |
| | 12.13.13 | <1.0 | <1.0 | <1.0 | <2.0 | <0.050 | <1.0 |
| 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 |
| | 6.27.13 | <1.0 | <1.0 | <1.0 | <2.0 | <0.050 | <1.0 |
| | 10.21.13 | <1.0 | <1.0 | <1.0 | <2.0 | <0.050 | <1.0 |
| | 12.12.13 | <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-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 |
| | 6.27.13 | **34** | 4.4 | 30 | 130 | 0.56 | 1.4 |
| | 10.22.13 | <1.0 | <1.0 | <1.0 | <2.0 | <0.050 | <1.0 |
| | 12.16.13 | <1.0 | <1.0 | <1.0 | <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 |
| | 6.27.13 | <1.0 | <1.0 | <1.0 | <2.0 | <0.050 | <1.0 |
| | 10.21.13 | <1.0 | <1.0 | <1.0 | <2.0 | <0.050 | <1.0 |
| | 12.12.13 | 1 | <1.0 | <1.0 | <2.0 | <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 |
| | 6.27.13 | <1.0 | <1.0 | <1.0 | <2.0 | <0.050 | <1.0 |
| | 10.21.13 | <1.0 | <1.0 | <1.0 | <2.0 | <0.050 | <1.0 |
| | 12.12.13 | <1.0 | <1.0 | <1.0 | <2.0 | <0.050 | <1.0 |

Southwest GEOSCIENCE

# 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 |
| | 6.27.13 | NS | NS | NS | NS | NS | NS |
| | 10.21.13 | NS | NS | NS | NS | NS | NS |
| | 12.12.13 | 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 |
| | 6.27.13 | **390** | <1.0 | 79 | 66 | 2.7 | 5.9 |
| | 10.22.13 | **140** | <1.0 | <1.0 | <2.0 | 0.51 | 2.1 |
| | 12.16.13 | **160** | <1.0 | 37 | 12 | 1.4 | 4.2 |
| 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 |
| | 6.27.13 | <1.0 | <1.0 | <1.0 | <2.0 | <0.050 | <1.0 |
| | 10.22.13 | <1.0 | <1.0 | <1.0 | <2.0 | <0.050 | <1.0 |
| | 12.16.13 | <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 |
| | 6.27.13 | ND | 12.61 | ND | | 6288.28 |
| | 10.22.13 | ND | 11.71 | ND | | 6289.18 |
| | 12.12.13 | ND | 11.35 | ND | | 6289.54 |
| 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 |
| | 6.27.13 | ND | 11.44 | ND | | 6288.38 |
| | 10.21.13 | ND | 10.44 | ND | | 6289.38 |
| | 12.12.13 | ND | 10.09 | ND | | 6289.73 |
| 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 |
| | 6.27.13 | ND | 12.06 | ND | | 6288.16 |
| | 10.21.13 | ND | 11.12 | ND | | 6289.10 |
| | 12.12.13 | ND | 10.84 | ND | | 6289.38 |
| 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 |
| | 6.27.13 | ND | 12.60 | ND | | 6288.31 |
| | 10.22.13 | ND | 11.74 | ND | | 6289.17 |
| | 12.12.13 | ND | 11.37 | ND | | 6289.54 |
| 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 |
| | 6.27.13 | ND | 12.82 | ND | | 6288.37 |
| | 10.21.13 | ND | 11.94 | ND | | 6289.25 |
| | 12.12.13 | ND | 11.61 | ND | | 6289.58 |

Southwest GEOSCIENCE

# TABLE 2
## K-51 Pipeline Release
### GROUNDWATER ELEVATIONS

| | | | | | | |
|---|---|---|---|---|---|---|
| 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 |
| | 6.27.13 | ND | 9.99 | ND | | 6289.09 |
| | 10.21.13 | ND | 9.09 | ND | | 6289.99 |
| | 12.12.13 | ND | 8.78 | ND | | 6290.30 |
| 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 |
| | 6.27.13 | ND | 9.94 | ND | | 6288.33 |
| | 10.21.13 | ND | 8.91 | ND | | 6289.36 |
| | 12.12.13 | ND | 8.57 | ND | | 6289.70 |
| 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 |
| | 6.27.13 | ND | 13.26 | ND | | 6287.94 |
| | 10.22.13 | ND | 12.39 | ND | | 6288.81 |
| | 12.12.13 | ND | 12.06 | ND | | 6289.14 |
| 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 |
| | 6.27.13 | ND | 12.37 | ND | | 6287.52 |
| | 10.21.13 | ND | 11.32 | ND | | 6288.57 |
| | 12.12.13 | ND | 10.92 | ND | | 6288.97 |
| 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 |
| | 6.27.13 | ND | 10.62 | ND | | 6287.95 |
| | 10.21.13 | ND | 9.61 | ND | | 6288.96 |
| | 12.12.13 | ND | 9.28 | ND | | 6289.29 |

Southwest GEOSCIENCE

# TABLE 2
## K-51 Pipeline Release
### GROUNDWATER ELEVATIONS

| | | | | | | |
|---|---|---|---|---|---|---|
| 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 |
| | 6.27.13 | ND | 16.86 | ND | | 6287.91 |
| | 10.22.13 | ND | NG | ND | | NG |
| | 12.12.13 | 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 |
| | 6.27.13 | ND | 16.19 | ND | | 6287.61 |
| | 10.22.13 | ND | 15.13 | ND | | 6288.67 |
| | 12.12.13 | ND | 14.78 | ND | | 6289.02 |
| 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 |
| | 6.27.13 | ND | 26.11 | ND | | 6286.48 |
| | 10.22.13 | ND | 24.98 | ND | | 6287.61 |
| | 12.12.13 | ND | 24.57 | ND | | 6288.02 |

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

Southwest GEOSCIENCE

# APPENDIX C

## Laboratory Data Reports & 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*

November 01, 2013

Kyle Summers

Southwest Geoscience
606 S. Rio Grande Unit A
Aztec, NM 87410
TEL: (903) 821-5603
FAX (214) 350-2914

RE: K-51 OrderNo.: 1310C23

Dear Kyle Summers:

Hall Environmental Analysis Laboratory received 12 sample(s) on 10/24/2013 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. In order to properly interpret your results it is imperative that you review this report in its entirety. 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. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. 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.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

**Analytical Report**
Lab Order **1310C23**
Date Reported: **11/1/2013**

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** Southwest Geoscience
**Client Sample ID:** MW-16
**Project:** K-51
**Collection Date:** 10/21/2013 12:55:00 PM
**Lab ID:** 1310C23-001 **Matrix:** AQUEOUS **Received Date:** 10/24/2013 10:10:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **BCN** | |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 10/29/2013 1:49:37 AM | 10038 |
| Surr: DNOP | 112 | 70.1-140 | | %REC | 1 | 10/29/2013 1:49:37 AM | 10038 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 10/30/2013 12:46:40 PM | R14466 |
| Surr: BFB | 96.7 | 51.5-151 | | %REC | 1 | 10/30/2013 12:46:40 PM | R14466 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | ND | 1.0 | | µg/L | 1 | 10/30/2013 12:46:40 PM | R14466 |
| Toluene | ND | 1.0 | | µg/L | 1 | 10/30/2013 12:46:40 PM | R14466 |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 10/30/2013 12:46:40 PM | R14466 |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 10/30/2013 12:46:40 PM | R14466 |
| Surr: 4-Bromofluorobenzene | 115 | 85-136 | | %REC | 1 | 10/30/2013 12:46:40 PM | R14466 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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:** 10/21/2013 1:50:00 PM
**Lab ID:** 1310C23-002 **Matrix:** AQUEOUS **Received Date:** 10/24/2013 10:10:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **BCN** | |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 10/29/2013 2:11:43 AM | 10038 |
| Surr: DNOP | 116 | 70.1-140 | | %REC | 1 | 10/29/2013 2:11:43 AM | 10038 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 10/30/2013 2:12:18 PM | R14466 |
| Surr: BFB | 94.6 | 51.5-151 | | %REC | 1 | 10/30/2013 2:12:18 PM | R14466 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | ND | 1.0 | | µg/L | 1 | 10/30/2013 2:12:18 PM | R14466 |
| Toluene | ND | 1.0 | | µg/L | 1 | 10/30/2013 2:12:18 PM | R14466 |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 10/30/2013 2:12:18 PM | R14466 |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 10/30/2013 2:12:18 PM | R14466 |
| Surr: 4-Bromofluorobenzene | 113 | 85-136 | | %REC | 1 | 10/30/2013 2:12:18 PM | R14466 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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:** 10/21/2013 2:45:00 PM
**Lab ID:** 1310C23-003
**Matrix:** AQUEOUS
**Received Date:** 10/24/2013 10:10:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **BCN** | |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 10/29/2013 2:33:42 AM | 10038 |
| Surr: DNOP | 117 | 70.1-140 | | %REC | 1 | 10/29/2013 2:33:42 AM | 10038 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 10/30/2013 3:38:15 PM | R14466 |
| Surr: BFB | 99.0 | 51.5-151 | | %REC | 1 | 10/30/2013 3:38:15 PM | R14466 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | ND | 1.0 | | µg/L | 1 | 10/30/2013 3:38:15 PM | R14466 |
| Toluene | ND | 1.0 | | µg/L | 1 | 10/30/2013 3:38:15 PM | R14466 |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 10/30/2013 3:38:15 PM | R14466 |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 10/30/2013 3:38:15 PM | R14466 |
| Surr: 4-Bromofluorobenzene | 119 | 85-136 | | %REC | 1 | 10/30/2013 3:38:15 PM | R14466 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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:** 10/21/2013 3:47:00 PM
**Lab ID:** 1310C23-004
**Matrix:** AQUEOUS
**Received Date:** 10/24/2013 10:10:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **BCN** | |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 10/29/2013 2:55:47 AM | 10038 |
| Surr: DNOP | 107 | 70.1-140 | | %REC | 1 | 10/29/2013 2:55:47 AM | 10038 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 10/30/2013 4:06:52 PM | R14466 |
| Surr: BFB | 97.5 | 51.5-151 | | %REC | 1 | 10/30/2013 4:06:52 PM | R14466 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | ND | 1.0 | | µg/L | 1 | 10/30/2013 4:06:52 PM | R14466 |
| Toluene | ND | 1.0 | | µg/L | 1 | 10/30/2013 4:06:52 PM | R14466 |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 10/30/2013 4:06:52 PM | R14466 |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 10/30/2013 4:06:52 PM | R14466 |
| Surr: 4-Bromofluorobenzene | 116 | 85-136 | | %REC | 1 | 10/30/2013 4:06:52 PM | R14466 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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:** 10/21/2013 4:50:00 PM
**Lab ID:** 1310C23-005 **Matrix:** AQUEOUS **Received Date:** 10/24/2013 10:10:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **BCN** | |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 10/29/2013 3:17:44 AM | 10038 |
| Surr: DNOP | 116 | 70.1-140 | | %REC | 1 | 10/29/2013 3:17:44 AM | 10038 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 10/30/2013 4:35:32 PM | R14466 |
| Surr: BFB | 97.1 | 51.5-151 | | %REC | 1 | 10/30/2013 4:35:32 PM | R14466 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | ND | 1.0 | | µg/L | 1 | 10/30/2013 4:35:32 PM | R14466 |
| Toluene | ND | 1.0 | | µg/L | 1 | 10/30/2013 4:35:32 PM | R14466 |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 10/30/2013 4:35:32 PM | R14466 |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 10/30/2013 4:35:32 PM | R14466 |
| Surr: 4-Bromofluorobenzene | 116 | 85-136 | | %REC | 1 | 10/30/2013 4:35:32 PM | R14466 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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:** 10/21/2013 5:55:00 PM
**Lab ID:** 1310C23-006
**Matrix:** AQUEOUS
**Received Date:** 10/24/2013 10:10:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **BCN** | |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 10/29/2013 3:39:59 AM | 10038 |
| Surr: DNOP | 115 | 70.1-140 | | %REC | 1 | 10/29/2013 3:39:59 AM | 10038 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 10/30/2013 5:04:05 PM | R14466 |
| Surr: BFB | 97.7 | 51.5-151 | | %REC | 1 | 10/30/2013 5:04:05 PM | R14466 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | ND | 1.0 | | µg/L | 1 | 10/30/2013 5:04:05 PM | R14466 |
| Toluene | ND | 1.0 | | µg/L | 1 | 10/30/2013 5:04:05 PM | R14466 |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 10/30/2013 5:04:05 PM | R14466 |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 10/30/2013 5:04:05 PM | R14466 |
| Surr: 4-Bromofluorobenzene | 117 | 85-136 | | %REC | 1 | 10/30/2013 5:04:05 PM | R14466 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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-3
**Project:** K-51
**Collection Date:** 10/21/2013 6:50:00 PM
**Lab ID:** 1310C23-007
**Matrix:** AQUEOUS
**Received Date:** 10/24/2013 10:10:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **BCN** | |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 10/29/2013 4:01:54 AM | 10038 |
| Surr: DNOP | 126 | 70.1-140 | | %REC | 1 | 10/29/2013 4:01:54 AM | 10038 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 10/30/2013 5:32:39 PM | R14466 |
| Surr: BFB | 97.7 | 51.5-151 | | %REC | 1 | 10/30/2013 5:32:39 PM | R14466 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | ND | 1.0 | | µg/L | 1 | 10/30/2013 5:32:39 PM | R14466 |
| Toluene | ND | 1.0 | | µg/L | 1 | 10/30/2013 5:32:39 PM | R14466 |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 10/30/2013 5:32:39 PM | R14466 |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 10/30/2013 5:32:39 PM | R14466 |
| Surr: 4-Bromofluorobenzene | 117 | 85-136 | | %REC | 1 | 10/30/2013 5:32:39 PM | R14466 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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:** 10/22/2013 9:05:00 AM
**Lab ID:** 1310C23-008
**Matrix:** AQUEOUS
**Received Date:** 10/24/2013 10:10:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **BCN** | |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 10/29/2013 4:45:52 AM | 10038 |
| Surr: DNOP | 123 | 70.1-140 | | %REC | 1 | 10/29/2013 4:45:52 AM | 10038 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | 0.13 | 0.050 | | mg/L | 1 | 10/30/2013 6:01:10 PM | R14466 |
| Surr: BFB | 130 | 51.5-151 | | %REC | 1 | 10/30/2013 6:01:10 PM | R14466 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | ND | 1.0 | | µg/L | 1 | 10/30/2013 6:01:10 PM | R14466 |
| Toluene | ND | 1.0 | | µg/L | 1 | 10/30/2013 6:01:10 PM | R14466 |
| Ethylbenzene | 12 | 1.0 | | µg/L | 1 | 10/30/2013 6:01:10 PM | R14466 |
| Xylenes, Total | 3.8 | 2.0 | | µg/L | 1 | 10/30/2013 6:01:10 PM | R14466 |
| Surr: 4-Bromofluorobenzene | 129 | 85-136 | | %REC | 1 | 10/30/2013 6:01:10 PM | R14466 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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:** 10/22/2013 10:25:00 AM
**Lab ID:** 1310C23-009
**Matrix:** AQUEOUS
**Received Date:** 10/24/2013 10:10:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **BCN** | |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 10/29/2013 5:08:01 AM | 10038 |
| Surr: DNOP | 130 | 70.1-140 | | %REC | 1 | 10/29/2013 5:08:01 AM | 10038 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | 0.23 | 0.050 | | mg/L | 1 | 10/30/2013 6:58:20 PM | R14466 |
| Surr: BFB | 112 | 51.5-151 | | %REC | 1 | 10/30/2013 6:58:20 PM | R14466 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | 39 | 1.0 | | µg/L | 1 | 10/30/2013 6:58:20 PM | R14466 |
| Toluene | ND | 1.0 | | µg/L | 1 | 10/30/2013 6:58:20 PM | R14466 |
| Ethylbenzene | 24 | 1.0 | | µg/L | 1 | 10/30/2013 6:58:20 PM | R14466 |
| Xylenes, Total | 13 | 2.0 | | µg/L | 1 | 10/30/2013 6:58:20 PM | R14466 |
| Surr: 4-Bromofluorobenzene | 123 | 85-136 | | %REC | 1 | 10/30/2013 6:58:20 PM | R14466 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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:** 10/22/2013 11:45:00 AM
**Lab ID:** 1310C23-010 **Matrix:** AQUEOUS **Received Date:** 10/24/2013 10:10:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **BCN** | |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 10/29/2013 5:29:56 AM | 10038 |
| Surr: DNOP | 142 | 70.1-140 | S | %REC | 1 | 10/29/2013 5:29:56 AM | 10038 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 10/30/2013 7:26:53 PM | R14466 |
| Surr: BFB | 97.8 | 51.5-151 | | %REC | 1 | 10/30/2013 7:26:53 PM | R14466 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | ND | 1.0 | | µg/L | 1 | 10/30/2013 7:26:53 PM | R14466 |
| Toluene | ND | 1.0 | | µg/L | 1 | 10/30/2013 7:26:53 PM | R14466 |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 10/30/2013 7:26:53 PM | R14466 |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 10/30/2013 7:26:53 PM | R14466 |
| Surr: 4-Bromofluorobenzene | 118 | 85-136 | | %REC | 1 | 10/30/2013 7:26:53 PM | R14466 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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:** 10/22/2013 12:45:00 PM
**Lab ID:** 1310C23-011 **Matrix:** AQUEOUS **Received Date:** 10/24/2013 10:10:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **BCN** | |
| Diesel Range Organics (DRO) | 2.1 | 1.0 | | mg/L | 1 | 10/29/2013 3:11:00 PM | 10038 |
| Surr: DNOP | 118 | 70.1-140 | | %REC | 1 | 10/29/2013 3:11:00 PM | 10038 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | 0.51 | 0.050 | | mg/L | 1 | 10/30/2013 9:49:34 PM | R14466 |
| Surr: BFB | 132 | 51.5-151 | | %REC | 1 | 10/30/2013 9:49:34 PM | R14466 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | 140 | 5.0 | | µg/L | 5 | 10/31/2013 2:34:53 PM | R14497 |
| Toluene | ND | 1.0 | | µg/L | 1 | 10/30/2013 9:49:34 PM | R14466 |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 10/30/2013 9:49:34 PM | R14466 |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 10/30/2013 9:49:34 PM | R14466 |
| Surr: 4-Bromofluorobenzene | 125 | 85-136 | | %REC | 1 | 10/30/2013 9:49:34 PM | R14466 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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:** 10/22/2013 1:55:00 PM
**Lab ID:** 1310C23-012 **Matrix:** AQUEOUS **Received Date:** 10/24/2013 10:10:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **BCN** | |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 10/29/2013 6:13:57 AM | 10038 |
| Surr: DNOP | 114 | 70.1-140 | | %REC | 1 | 10/29/2013 6:13:57 AM | 10038 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 10/30/2013 10:46:33 PM | R14466 |
| Surr: BFB | 99.3 | 51.5-151 | | %REC | 1 | 10/30/2013 10:46:33 PM | R14466 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | ND | 1.0 | | µg/L | 1 | 10/30/2013 10:46:33 PM | R14466 |
| Toluene | ND | 1.0 | | µg/L | 1 | 10/30/2013 10:46:33 PM | R14466 |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 10/30/2013 10:46:33 PM | R14466 |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 10/30/2013 10:46:33 PM | R14466 |
| Surr: 4-Bromofluorobenzene | 119 | 85-136 | | %REC | 1 | 10/30/2013 10:46:33 PM | R14466 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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#: **1310C23**

***01-Nov-13***

**Client:** Southwest Geoscience

**Project:** K-51

| Sample ID **MB-10038** | SampType: **MBLK** | TestCode: **EPA Method 8015D: Diesel Range** |
|---|---|---|
| Client ID: **PBW** | Batch ID: **10038** | RunNo: **14373** |
| Prep Date: **10/28/2013** | Analysis Date: **10/28/2013** | SeqNo: **412960** 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 | 1.2 | | 1.000 | | 118 | 70.1 | 140 | | | |

| Sample ID **LCS-10038** | SampType: **LCS** | TestCode: **EPA Method 8015D: Diesel Range** |
|---|---|---|
| Client ID: **LCSW** | Batch ID: **10038** | RunNo: **14373** |
| Prep Date: **10/28/2013** | Analysis Date: **10/28/2013** | SeqNo: **412961** Units: **mg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | 5.0 | 1.0 | 5.000 | 0 | 99.1 | 73.3 | 145 | | | |
| Surr: DNOP | 0.55 | | 0.5000 | | 110 | 70.1 | 140 | | | |

| Sample ID **LCSD-10038** | SampType: **LCSD** | TestCode: **EPA Method 8015D: Diesel Range** |
|---|---|---|
| Client ID: **LCSS02** | Batch ID: **10038** | RunNo: **14373** |
| Prep Date: **10/28/2013** | Analysis Date: **10/28/2013** | SeqNo: **412962** Units: **mg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | 5.1 | 1.0 | 5.000 | 0 | 102 | 73.3 | 145 | 2.99 | 20 | |
| Surr: DNOP | 0.55 | | 0.5000 | | 111 | 70.1 | 140 | 0 | 0 | |

**Qualifiers:**

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery 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
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: **1310C23**

***01-Nov-13***

**Client:** Southwest Geoscience

**Project:** K-51

| Sample ID **5ML RB** | SampType: **MBLK** | TestCode: **EPA Method 8015D: Gasoline Range** |
|---|---|---|
| Client ID: **PBW** | Batch ID: **R14466** | RunNo: **14466** |
| Prep Date: | Analysis Date: **10/30/2013** | SeqNo: **415629** 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 | 19 | | 20.00 | | 96.5 | 51.5 | 151 | | | |

| Sample ID **2.5UG GRO LCS** | SampType: **LCS** | TestCode: **EPA Method 8015D: Gasoline Range** |
|---|---|---|
| Client ID: **LCSW** | Batch ID: **R14466** | RunNo: **14466** |
| Prep Date: | Analysis Date: **10/30/2013** | SeqNo: **415630** 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 | 105 | 80 | 120 | | | |
| Surr: BFB | 21 | | 20.00 | | 104 | 51.5 | 151 | | | |

| Sample ID **1310C23-001AMS** | SampType: **MS** | TestCode: **EPA Method 8015D: Gasoline Range** |
|---|---|---|
| Client ID: **MW-16** | Batch ID: **R14466** | RunNo: **14466** |
| Prep Date: | Analysis Date: **10/30/2013** | SeqNo: **415632** 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 | 67.7 | 128 | | | |
| Surr: BFB | 21 | | 20.00 | | 106 | 51.5 | 151 | | | |

| Sample ID **1310C23-001AMSD** | SampType: **MSD** | TestCode: **EPA Method 8015D: Gasoline Range** |
|---|---|---|
| Client ID: **MW-16** | Batch ID: **R14466** | RunNo: **14466** |
| Prep Date: | Analysis Date: **10/30/2013** | SeqNo: **415633** Units: **mg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Gasoline Range Organics (GRO) | 0.51 | 0.050 | 0.5000 | 0 | 102 | 67.7 | 128 | 2.60 | 20 | |
| Surr: BFB | 21 | | 20.00 | | 106 | 51.5 | 151 | 0 | 0 | |

| Sample ID **5ML RB** | SampType: **MBLK** | TestCode: **EPA Method 8015D: Gasoline Range** |
|---|---|---|
| Client ID: **PBW** | Batch ID: **R14497** | RunNo: **14497** |
| Prep Date: | Analysis Date: **10/31/2013** | SeqNo: **416401** Units: **%REC** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Surr: BFB | 19 | | 20.00 | | 92.8 | 51.5 | 151 | | | |

| Sample ID **2.5UG GRO LCS** | SampType: **LCS** | TestCode: **EPA Method 8015D: Gasoline Range** |
|---|---|---|
| Client ID: **LCSW** | Batch ID: **R14497** | RunNo: **14497** |
| Prep Date: | Analysis Date: **10/31/2013** | SeqNo: **416402** Units: **%REC** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Surr: BFB | 20 | | 20.00 | | 101 | 51.5 | 151 | | | |

**Qualifiers:**

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery 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
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: **1310C23**

***01-Nov-13***

**Client:** Southwest Geoscience

**Project:** K-51

| Sample ID **5ML RB** | SampType: **MBLK** | TestCode: **EPA Method 8021B: Volatiles** |
|---|---|---|
| Client ID: **PBW** | Batch ID: **R14466** | RunNo: **14466** |
| Prep Date: | Analysis Date: **10/30/2013** | SeqNo: **415656** 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 | 23 | | 20.00 | | 115 | 85 | 136 | | | |

| Sample ID **100NG BTEX LCS** | SampType: **LCS** | TestCode: **EPA Method 8021B: Volatiles** |
|---|---|---|
| Client ID: **LCSW** | Batch ID: **R14466** | RunNo: **14466** |
| Prep Date: | Analysis Date: **10/30/2013** | SeqNo: **415657** Units: **µg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 19 | 1.0 | 20.00 | 0 | 96.4 | 80 | 120 | | | |
| Toluene | 20 | 1.0 | 20.00 | 0 | 101 | 80 | 120 | | | |
| Ethylbenzene | 20 | 1.0 | 20.00 | 0 | 101 | 80 | 120 | | | |
| Xylenes, Total | 61 | 2.0 | 60.00 | 0 | 102 | 80 | 120 | | | |
| Surr: 4-Bromofluorobenzene | 24 | | 20.00 | | 122 | 85 | 136 | | | |

| Sample ID **1310C23-002AMS** | SampType: **MS** | TestCode: **EPA Method 8021B: Volatiles** |
|---|---|---|
| Client ID: **MW-17** | Batch ID: **R14466** | RunNo: **14466** |
| Prep Date: | Analysis Date: **10/30/2013** | SeqNo: **415660** Units: **µg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 15 | 1.0 | 20.00 | 0 | 74.7 | 73.4 | 119 | | | |
| Toluene | 16 | 1.0 | 20.00 | 0 | 78.3 | 80 | 120 | | | S |
| Ethylbenzene | 16 | 1.0 | 20.00 | 0 | 78.5 | 80 | 120 | | | S |
| Xylenes, Total | 48 | 2.0 | 60.00 | 0 | 80.1 | 80 | 120 | | | |
| Surr: 4-Bromofluorobenzene | 24 | | 20.00 | | 121 | 85 | 136 | | | |

| Sample ID **1310C23-002AMSD** | SampType: **MSD** | TestCode: **EPA Method 8021B: Volatiles** |
|---|---|---|
| Client ID: **MW-17** | Batch ID: **R14466** | RunNo: **14466** |
| Prep Date: | Analysis Date: **10/30/2013** | SeqNo: **415661** Units: **µg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 14 | 1.0 | 20.00 | 0 | 69.5 | 73.4 | 119 | 7.23 | 20 | S |
| Toluene | 15 | 1.0 | 20.00 | 0 | 73.5 | 80 | 120 | 6.39 | 20 | S |
| Ethylbenzene | 15 | 1.0 | 20.00 | 0 | 74.7 | 80 | 120 | 4.96 | 20 | S |
| Xylenes, Total | 45 | 2.0 | 60.00 | 0 | 75.2 | 80 | 120 | 6.31 | 20 | S |
| Surr: 4-Bromofluorobenzene | 24 | | 20.00 | | 119 | 85 | 136 | 0 | 0 | |

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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#: **1310C23**

***01-Nov-13***

**Client:** Southwest Geoscience

**Project:** K-51

| Sample ID **5ML RB** | SampType: **MBLK** | TestCode: **EPA Method 8021B: Volatiles** |
|---|---|---|
| Client ID: **PBW** | Batch ID: **R14497** | RunNo: **14497** |
| Prep Date: | Analysis Date: **10/31/2013** | SeqNo: **416431** Units: **µg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | ND | 1.0 | | | | | | | | |
| Surr: 4-Bromofluorobenzene | 20 | | 20.00 | | 102 | 85 | 136 | | | |

| Sample ID **100NG BTEX LCS** | SampType: **LCS** | TestCode: **EPA Method 8021B: Volatiles** |
|---|---|---|
| Client ID: **LCSW** | Batch ID: **R14497** | RunNo: **14497** |
| Prep Date: | Analysis Date: **10/31/2013** | SeqNo: **416432** Units: **µg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 18 | 1.0 | 20.00 | 0 | 91.2 | 80 | 120 | | | |
| Surr: 4-Bromofluorobenzene | 21 | | 20.00 | | 103 | 85 | 136 | | | |

**Qualifiers:**

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery 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
- P Sample pH greater than 2 for VOA and TOC only.
- 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: 1310C23 RcptNo: 1

Received by/date: AT 10/24/13

Logged By: **Lindsay Mangin** 10/24/2013 10:10:00 AM

Completed By: **Lindsay Mangin** 10/25/2013 8:34:33 AM

Reviewed By: IC 10/25/13

## 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 606 Rio Grande Ste. A
Aztec, NM 87410
Project Manager K. Summers

Laboratory: Hall Laboratory
Address: Albuquerque, NM
Contact:
Phone:
PO/SO #: 0410003

Lab use only
Due Date:

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

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

Page 1 of 2

Sampler's Name: Joseph Doyle
Sampler's Signature: Joseph Doyle

Proj. No.: 0410G003
Project Name: K-51

| 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 | ANALYSIS REQUESTED: BTEX 8021 | TPH 8015 GRO/DRO | Lab Sample ID (Lab Use Only) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W | 10/21/13 | 1255 | | X | MW-16 | | | 5 | | | | X | X | 1310C23-001 |
| W | 10/21/13 | 1350 | | X | MW-17 | | | 5 | | | | X | X | -002 |
| W | 10/21/13 | 1445 | | X | MW-13 | | | 5 | | | | X | X | -003 |
| W | 10/21/13 | 1547 | | X | MW-12 | | | 5 | | | | X | X | -004 |
| W | 10/21/13 | 1650 | | X | MW-11 | | | 5 | | | | X | X | -005 |
| W | 10/21/13 | 1755 | | X | MW-2 | | | 5 | | | | X | X | -006 |
| W | 10/21/13 | 1850 | | X | MW-3 | | | 5 | | | | X | X | -007 |
| W | 10/22/13 | 0905 | | X | MW-4 | | | 5 | | | | X | X | -008 |
| W | 10/22/13 | 1025 | | X | MW-1 | | | 5 | | | | X | X | -009 |
| W | 10/23/13 | 1145 | | X | MW-14 | | | 5 | | | | X | X | -010 |

Turn around time: (X) Normal ❑ 25% Rush ❑ 50% Rush ❑ 100% Rush

| Relinquished by (Signature) | Date: | Time: | Received by: (Signature) | Date: | Time: |
|---|---|---|---|---|---|
| Joseph Doyle | 10/22/13 | 1420 | | 10/22/13 | 1420 |
| | 10/23/13 | 5:30 AM | | 10/23/13 | 0530 |
| | 10/23/13 | 1240 | Christian Walden | 10/23/13 | 1240 |
| Christian Walden | 10/24/13 | 640 | | 10/24/13 | 1010 |

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

Office Location 606 Rio Grande Ste. A
Aztec, NM 87410
Project Manager K. Summers

Laboratory: Hall Laboratories
Address: Albuquerque, NM
Contact:
Phone:
PO/SO #: 04116003

Sampler's Name: Joseph Dale
Sampler's Signature: Joseph Dale

Proj. No.: 04116-003
Project Name: K-51

ANALYSIS REQUESTED: BTEX 8021; TPH 8015 GRO/DRO

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

| 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 | BTEX 8021 | TPH 8015 GRO/DRO | | | | | | | | | Lab Sample ID (Lab Use Only) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W | 10/22/13 | 1245 | | X | MW-19 | | | 5 | | | | X | X | | | | | | | | | 1310823-011 |
| W | 10/22/13 | 1335 | | X | MW-20 | | | 5 | | | | X | X | | | | | | | | | -012 |

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

| Relinquished by (Signature) | Date: | Time: | Received by: (Signature) | Date: | Time: |
|---|---|---|---|---|---|
| Joseph Dale | 10/22/13 | 1420 | | 10/22/13 | 1420 |
| | 10/23/13 | 6:00 AM | | 10/23/13 | 0600 |
| | 10/23/13 | 1240 | Christine Walters | 10/23/13 | 1240 |
| Christine Walters | 10/24/13 | 640 | | 10/24/13 | 10/0 |

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

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*

December 19, 2013

Kyle Summers

Southwest Geoscience
606 S. Rio Grande Unit A
Aztec, NM 87410
TEL: (903) 821-5603
FAX (214) 350-2914

RE: K-51 OrderNo.: 1312645

Dear Kyle Summers:

Hall Environmental Analysis Laboratory received 8 sample(s) on 12/16/2013 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. In order to properly interpret your results it is imperative that you review this report in its entirety. 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. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. 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.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

**Analytical Report**
Lab Order **1312645**
Date Reported: **12/19/2013**

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** Southwest Geoscience
**Client Sample ID:** MW-2
**Project:** K-51
**Collection Date:** 12/13/2013 11:45:00 AM
**Lab ID:** 1312645-001 **Matrix:** AQUEOUS **Received Date:** 12/16/2013 10:00:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **BCN** | |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 12/19/2013 12:09:42 AM | 10842 |
| Surr: DNOP | 109 | 70.1-140 | | %REC | 1 | 12/19/2013 12:09:42 AM | 10842 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 12/18/2013 2:17:39 PM | R15587 |
| Surr: BFB | 84.5 | 80.4-118 | | %REC | 1 | 12/18/2013 2:17:39 PM | R15587 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | ND | 1.0 | | µg/L | 1 | 12/18/2013 2:17:39 PM | R15587 |
| Toluene | ND | 1.0 | | µg/L | 1 | 12/18/2013 2:17:39 PM | R15587 |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 12/18/2013 2:17:39 PM | R15587 |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 12/18/2013 2:17:39 PM | R15587 |
| Surr: 4-Bromofluorobenzene | 93.4 | 85-136 | | %REC | 1 | 12/18/2013 2:17:39 PM | R15587 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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-3
**Project:** K-51
**Collection Date:** 12/13/2013 10:50:00 AM
**Lab ID:** 1312645-002 **Matrix:** AQUEOUS **Received Date:** 12/16/2013 10:00:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **BCN** | |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 12/19/2013 12:31:29 AM | 10842 |
| Surr: DNOP | 106 | 70.1-140 | | %REC | 1 | 12/19/2013 12:31:29 AM | 10842 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 12/18/2013 2:47:52 PM | R15587 |
| Surr: BFB | 84.3 | 80.4-118 | | %REC | 1 | 12/18/2013 2:47:52 PM | R15587 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | ND | 1.0 | | µg/L | 1 | 12/18/2013 2:47:52 PM | R15587 |
| Toluene | ND | 1.0 | | µg/L | 1 | 12/18/2013 2:47:52 PM | R15587 |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 12/18/2013 2:47:52 PM | R15587 |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 12/18/2013 2:47:52 PM | R15587 |
| Surr: 4-Bromofluorobenzene | 94.3 | 85-136 | | %REC | 1 | 12/18/2013 2:47:52 PM | R15587 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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:** 12/13/2013 1:40:00 PM
**Lab ID:** 1312645-003
**Matrix:** AQUEOUS
**Received Date:** 12/16/2013 10:00:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **BCN** | |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 12/19/2013 12:53:05 AM | 10842 |
| Surr: DNOP | 102 | 70.1-140 | | %REC | 1 | 12/19/2013 12:53:05 AM | 10842 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | 0.42 | 0.050 | | mg/L | 1 | 12/18/2013 3:18:04 PM | R15587 |
| Surr: BFB | 156 | 80.4-118 | S | %REC | 1 | 12/18/2013 3:18:04 PM | R15587 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | ND | 1.0 | | µg/L | 1 | 12/18/2013 3:18:04 PM | R15587 |
| Toluene | ND | 1.0 | | µg/L | 1 | 12/18/2013 3:18:04 PM | R15587 |
| Ethylbenzene | 16 | 1.0 | | µg/L | 1 | 12/18/2013 3:18:04 PM | R15587 |
| Xylenes, Total | 6.2 | 2.0 | | µg/L | 1 | 12/18/2013 3:18:04 PM | R15587 |
| Surr: 4-Bromofluorobenzene | 136 | 85-136 | S | %REC | 1 | 12/18/2013 3:18:04 PM | R15587 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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:** 12/13/2013 3:00:00 PM
**Lab ID:** 1312645-004 **Matrix:** AQUEOUS **Received Date:** 12/16/2013 10:00:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **BCN** | |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 12/19/2013 1:15:00 AM | 10842 |
| Surr: DNOP | 104 | 70.1-140 | | %REC | 1 | 12/19/2013 1:15:00 AM | 10842 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 12/18/2013 3:48:14 PM | R15587 |
| Surr: BFB | 84.1 | 80.4-118 | | %REC | 1 | 12/18/2013 3:48:14 PM | R15587 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | ND | 1.0 | | µg/L | 1 | 12/18/2013 3:48:14 PM | R15587 |
| Toluene | ND | 1.0 | | µg/L | 1 | 12/18/2013 3:48:14 PM | R15587 |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 12/18/2013 3:48:14 PM | R15587 |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 12/18/2013 3:48:14 PM | R15587 |
| Surr: 4-Bromofluorobenzene | 96.2 | 85-136 | | %REC | 1 | 12/18/2013 3:48:14 PM | R15587 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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:** 12/13/2013 12:45:00 PM
**Lab ID:** 1312645-005 **Matrix:** AQUEOUS **Received Date:** 12/16/2013 10:00:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **BCN** | |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 12/19/2013 1:37:00 AM | 10842 |
| Surr: DNOP | 111 | 70.1-140 | | %REC | 1 | 12/19/2013 1:37:00 AM | 10842 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 12/18/2013 5:18:38 PM | R15587 |
| Surr: BFB | 84.4 | 80.4-118 | | %REC | 1 | 12/18/2013 5:18:38 PM | R15587 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | ND | 1.0 | | µg/L | 1 | 12/18/2013 5:18:38 PM | R15587 |
| Toluene | ND | 1.0 | | µg/L | 1 | 12/18/2013 5:18:38 PM | R15587 |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 12/18/2013 5:18:38 PM | R15587 |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 12/18/2013 5:18:38 PM | R15587 |
| Surr: 4-Bromofluorobenzene | 97.8 | 85-136 | | %REC | 1 | 12/18/2013 5:18:38 PM | R15587 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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:** 12/12/2013 3:55:00 PM
**Lab ID:** 1312645-006
**Matrix:** AQUEOUS
**Received Date:** 12/16/2013 10:00:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **BCN** | |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 12/19/2013 2:01:01 AM | 10842 |
| Surr: DNOP | 102 | 70.1-140 | | %REC | 1 | 12/19/2013 2:01:01 AM | 10842 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 12/18/2013 6:49:23 PM | R15587 |
| Surr: BFB | 85.4 | 80.4-118 | | %REC | 1 | 12/18/2013 6:49:23 PM | R15587 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | ND | 1.0 | | µg/L | 1 | 12/18/2013 6:49:23 PM | R15587 |
| Toluene | ND | 1.0 | | µg/L | 1 | 12/18/2013 6:49:23 PM | R15587 |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 12/18/2013 6:49:23 PM | R15587 |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 12/18/2013 6:49:23 PM | R15587 |
| Surr: 4-Bromofluorobenzene | 101 | 85-136 | | %REC | 1 | 12/18/2013 6:49:23 PM | R15587 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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:** 12/12/2013 2:05:00 PM
**Lab ID:** 1312645-007
**Matrix:** AQUEOUS
**Received Date:** 12/16/2013 10:00:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **BCN** | |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 12/19/2013 2:22:42 AM | 10842 |
| Surr: DNOP | 122 | 70.1-140 | | %REC | 1 | 12/19/2013 2:22:42 AM | 10842 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 12/18/2013 10:20:24 PM | R15587 |
| Surr: BFB | 82.7 | 80.4-118 | | %REC | 1 | 12/18/2013 10:20:24 PM | R15587 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | 1.0 | 1.0 | | µg/L | 1 | 12/18/2013 10:20:24 PM | R15587 |
| Toluene | ND | 1.0 | | µg/L | 1 | 12/18/2013 10:20:24 PM | R15587 |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 12/18/2013 10:20:24 PM | R15587 |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 12/18/2013 10:20:24 PM | R15587 |
| Surr: 4-Bromofluorobenzene | 92.2 | 85-136 | | %REC | 1 | 12/18/2013 10:20:24 PM | R15587 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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:** 12/12/2013 3:05:00 PM
**Lab ID:** 1312645-008 **Matrix:** AQUEOUS **Received Date:** 12/16/2013 10:00:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **BCN** | |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 12/19/2013 2:44:44 AM | 10842 |
| Surr: DNOP | 116 | 70.1-140 | | %REC | 1 | 12/19/2013 2:44:44 AM | 10842 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 12/18/2013 10:50:26 PM | R15587 |
| Surr: BFB | 86.2 | 80.4-118 | | %REC | 1 | 12/18/2013 10:50:26 PM | R15587 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | ND | 1.0 | | µg/L | 1 | 12/18/2013 10:50:26 PM | R15587 |
| Toluene | ND | 1.0 | | µg/L | 1 | 12/18/2013 10:50:26 PM | R15587 |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 12/18/2013 10:50:26 PM | R15587 |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 12/18/2013 10:50:26 PM | R15587 |
| Surr: 4-Bromofluorobenzene | 95.4 | 85-136 | | %REC | 1 | 12/18/2013 10:50:26 PM | R15587 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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#: **1312645**

***19-Dec-13***

**Client:** Southwest Geoscience

**Project:** K-51

| Sample ID **MB-10842** | SampType: **MBLK** | TestCode: **EPA Method 8015D: Diesel Range** |
|---|---|---|
| Client ID: **PBW** | Batch ID: **10842** | RunNo: **15573** |
| Prep Date: **12/17/2013** | Analysis Date: **12/18/2013** | SeqNo: **448704** 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 | 0.91 | | 1.000 | | 90.5 | 70.1 | 140 | | | |

| Sample ID **LCS-10842** | SampType: **LCS** | TestCode: **EPA Method 8015D: Diesel Range** |
|---|---|---|
| Client ID: **LCSW** | Batch ID: **10842** | RunNo: **15573** |
| Prep Date: **12/17/2013** | Analysis Date: **12/18/2013** | SeqNo: **448809** Units: **mg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | 5.6 | 1.0 | 5.000 | 0 | 113 | 73.3 | 145 | | | |
| Surr: DNOP | 0.52 | | 0.5000 | | 105 | 70.1 | 140 | | | |

| Sample ID **LCSD-10842** | SampType: **LCSD** | TestCode: **EPA Method 8015D: Diesel Range** |
|---|---|---|
| Client ID: **LCSS02** | Batch ID: **10842** | RunNo: **15573** |
| Prep Date: **12/17/2013** | Analysis Date: **12/18/2013** | SeqNo: **448863** 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 | 114 | 73.3 | 145 | 0.556 | 20 | |
| Surr: DNOP | 0.53 | | 0.5000 | | 106 | 70.1 | 140 | 0 | 0 | |

**Qualifiers:**

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery 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
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: **1312645**

***19-Dec-13***

**Client:** Southwest Geoscience

**Project:** K-51

| Sample ID **5ML RB** | SampType: **MBLK** | TestCode: **EPA Method 8015D: Gasoline Range** |
|---|---|---|
| Client ID: **PBW** | Batch ID: **R15587** | RunNo: **15587** |
| Prep Date: | Analysis Date: **12/18/2013** | SeqNo: **449162** 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 | 16 | | 20.00 | | 81.2 | 80.4 | 118 | | | |

| Sample ID **2.5UG GRO LCS** | SampType: **LCS** | TestCode: **EPA Method 8015D: Gasoline Range** |
|---|---|---|
| Client ID: **LCSW** | Batch ID: **R15587** | RunNo: **15587** |
| Prep Date: | Analysis Date: **12/18/2013** | SeqNo: **449163** Units: **mg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Gasoline Range Organics (GRO) | 0.50 | 0.050 | 0.5000 | 0 | 99.3 | 80 | 120 | | | |
| Surr: BFB | 18 | | 20.00 | | 89.7 | 80.4 | 118 | | | |

| Sample ID **1312645-004AMS** | SampType: **MS** | TestCode: **EPA Method 8015D: Gasoline Range** |
|---|---|---|
| Client ID: **MW-11** | Batch ID: **R15587** | RunNo: **15587** |
| Prep Date: | Analysis Date: **12/18/2013** | SeqNo: **449170** 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 | 107 | 67.7 | 128 | | | |
| Surr: BFB | 17 | | 20.00 | | 86.9 | 80.4 | 118 | | | |

| Sample ID **1312645-004AMSD** | SampType: **MSD** | TestCode: **EPA Method 8015D: Gasoline Range** |
|---|---|---|
| Client ID: **MW-11** | Batch ID: **R15587** | RunNo: **15587** |
| Prep Date: | Analysis Date: **12/18/2013** | SeqNo: **449171** 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 | 107 | 67.7 | 128 | 0.149 | 20 | |
| Surr: BFB | 18 | | 20.00 | | 90.0 | 80.4 | 118 | 0 | 0 | |

**Qualifiers:**

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery 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
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: **1312645**

***19-Dec-13***

**Client:** Southwest Geoscience

**Project:** K-51

| Sample ID **5ML RB** | SampType: **MBLK** | TestCode: **EPA Method 8021B: Volatiles** |
|---|---|---|
| Client ID: **PBW** | Batch ID: **R15587** | RunNo: **15587** |
| Prep Date: | Analysis Date: **12/18/2013** | SeqNo: **449180** 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 | 19 | | 20.00 | | 93.6 | 85 | 136 | | | |

| Sample ID **100NG BTEX LCS** | SampType: **LCS** | TestCode: **EPA Method 8021B: Volatiles** |
|---|---|---|
| Client ID: **LCSW** | Batch ID: **R15587** | RunNo: **15587** |
| Prep Date: | Analysis Date: **12/18/2013** | SeqNo: **449181** Units: **µg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 21 | 1.0 | 20.00 | 0 | 105 | 80 | 120 | | | |
| Toluene | 21 | 1.0 | 20.00 | 0 | 105 | 80 | 120 | | | |
| Ethylbenzene | 21 | 1.0 | 20.00 | 0 | 103 | 80 | 120 | | | |
| Xylenes, Total | 63 | 2.0 | 60.00 | 0 | 105 | 80 | 120 | | | |
| Surr: 4-Bromofluorobenzene | 20 | | 20.00 | | 101 | 85 | 136 | | | |

| Sample ID **1312645-005AMS** | SampType: **MS** | TestCode: **EPA Method 8021B: Volatiles** |
|---|---|---|
| Client ID: **MW-12** | Batch ID: **R15587** | RunNo: **15587** |
| Prep Date: | Analysis Date: **12/18/2013** | SeqNo: **449190** Units: **µg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 18 | 1.0 | 20.00 | 0.3040 | 87.4 | 73.4 | 119 | | | |
| Toluene | 18 | 1.0 | 20.00 | 0.4540 | 85.7 | 80 | 120 | | | |
| Ethylbenzene | 17 | 1.0 | 20.00 | 0.3360 | 85.7 | 80 | 120 | | | |
| Xylenes, Total | 53 | 2.0 | 60.00 | 0.8440 | 87.6 | 80 | 120 | | | |
| Surr: 4-Bromofluorobenzene | 20 | | 20.00 | | 100 | 85 | 136 | | | |

| Sample ID **1312645-005AMSD** | SampType: **MSD** | TestCode: **EPA Method 8021B: Volatiles** |
|---|---|---|
| Client ID: **MW-12** | Batch ID: **R15587** | RunNo: **15587** |
| Prep Date: | Analysis Date: **12/18/2013** | SeqNo: **449191** Units: **µg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 18 | 1.0 | 20.00 | 0.3040 | 90.7 | 73.4 | 119 | 3.60 | 20 | |
| Toluene | 18 | 1.0 | 20.00 | 0.4540 | 89.5 | 80 | 120 | 4.21 | 20 | |
| Ethylbenzene | 18 | 1.0 | 20.00 | 0.3360 | 89.0 | 80 | 120 | 3.66 | 20 | |
| Xylenes, Total | 55 | 2.0 | 60.00 | 0.8440 | 91.0 | 80 | 120 | 3.74 | 20 | |
| Surr: 4-Bromofluorobenzene | 21 | | 20.00 | | 104 | 85 | 136 | 0 | 0 | |

**Qualifiers:**

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery 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
- P Sample pH greater than 2 for VOA and TOC only.
- 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: 1312645 RcptNo: 1

Received by/date: 12/16/13

Logged By: **Lindsay Mangin** 12/16/2013 10:00:00 AM

Completed By: **Lindsay Mangin** 12/16/2013 11:18:20 AM

Reviewed By: MG 12/18/13

## 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, NM
Project Manager: KYLE SUMMERS

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

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

Sampler's Name: AARON BRYANT
Sampler's Signature:
Proj. No.: 04106003
Project Name: K-51
No/Type of Containers

ANALYSIS REQUESTED: BTEX 8021; TPH 8015 DRO/GRO

| Matrix | Date | Time | Comp | Grab | Identifying Marks of Sample(s) | Start Depth | End Depth | VOA | A/G 1 Lt. | 250 ml | P/O | Lab Sample ID (Lab Use Only) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W | 12/13/13 | 1145 | | ✓ | MW-2 | | * | 5 | 2 | | | 1312645-001 |
| W | 12/13/13 | 1050 | | ✓ | MW-3 | | * | 5 | 3 | | | -002 |
| W | 12/13/13 | 1340 | | ✓ | MW-4 | | * | 5 | 4 | | | -003 |
| W | 12/13/13 | 1500 | | ✓ | MW-11 | | | 5 | | | | -004 |
| W | 12/13/13 | 1245 | | ✓ | MW-12 | | * | 5 | 4 | | | -005 |
| W | 12/12/13 | 1555 | | ✓ | MW-13 | | * | 5 | 4 | | | -006 |
| W | 12/12/13 | 1405 | | ✓ | MW-16 | | * | 5 | 4 | | | -007 |
| W | 12/12/13 | 1505 | | ✓ | MW-17 | | * | 5 | 3 | | | -008 |

NFS AB

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

| Relinquished by (Signature) | Date | Time | Received by: (Signature) | Date | Time |
|---|---|---|---|---|---|
| | 12/14/13 | 0800 | | 12/14/13 | 0800 |
| | 12/14/13 | 1500 | Matthew Walker | 12/14/13 | 1506 |
| | 12/16/13 | 1645 | | 12/16/13 | 1000 |
| | | | | | |

NOTES:
*Sample had broken VOAs
12/18/13

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

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*

December 23, 2013

Kyle Summers

Southwest Geoscience
606 S. Rio Grande Unit A
Aztec, NM 87410
TEL: (903) 821-5603
FAX: (214) 350-2914

RE: K-51 OrderNo.: 1312936

Dear Kyle Summers:

Hall Environmental Analysis Laboratory received 4 sample(s) on 12/17/2013 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. In order to properly interpret your results it is imperative that you review this report in its entirety. 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. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. 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.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

**Analytical Report**
Lab Order **1312936**
Date Reported: **12/23/2013**

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** Southwest Geoscience
**Client Sample ID:** MW-1
**Project:** K-51
**Collection Date:** 12/16/2013 10:55:00 AM
**Lab ID:** 1312936-001
**Matrix:** AQUEOUS
**Received Date:** 12/17/2013 10:00:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **JME** | |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 12/23/2013 9:45:48 AM | 10914 |
| Surr: DNOP | 126 | 70.1-140 | | %REC | 1 | 12/23/2013 9:45:48 AM | 10914 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | 0.18 | 0.050 | | mg/L | 1 | 12/20/2013 4:04:21 PM | R15650 |
| Surr: BFB | 97.0 | 80.4-118 | | %REC | 1 | 12/20/2013 4:04:21 PM | R15650 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | 23 | 1.0 | | µg/L | 1 | 12/20/2013 4:04:21 PM | R15650 |
| Toluene | ND | 1.0 | | µg/L | 1 | 12/20/2013 4:04:21 PM | R15650 |
| Ethylbenzene | 14 | 1.0 | | µg/L | 1 | 12/20/2013 4:04:21 PM | R15650 |
| Xylenes, Total | 11 | 2.0 | | µg/L | 1 | 12/20/2013 4:04:21 PM | R15650 |
| Surr: 4-Bromofluorobenzene | 105 | 85-136 | | %REC | 1 | 12/20/2013 4:04:21 PM | R15650 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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:** 12/16/2013 12:30:00 PM
**Lab ID:** 1312936-002
**Matrix:** AQUEOUS
**Received Date:** 12/17/2013 10:00:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **JME** | |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 12/23/2013 10:07:41 AM | 10914 |
| Surr: DNOP | 126 | 70.1-140 | | %REC | 1 | 12/23/2013 10:07:41 AM | 10914 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 12/20/2013 4:34:38 PM | R15650 |
| Surr: BFB | 89.5 | 80.4-118 | | %REC | 1 | 12/20/2013 4:34:38 PM | R15650 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | ND | 1.0 | | µg/L | 1 | 12/20/2013 4:34:38 PM | R15650 |
| Toluene | ND | 1.0 | | µg/L | 1 | 12/20/2013 4:34:38 PM | R15650 |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 12/20/2013 4:34:38 PM | R15650 |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 12/20/2013 4:34:38 PM | R15650 |
| Surr: 4-Bromofluorobenzene | 106 | 85-136 | | %REC | 1 | 12/20/2013 4:34:38 PM | R15650 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | |
|---|---|
| * | Value exceeds Maximum Contaminant Level. |
| E | Value above quantitation range |
| J | Analyte detected below quantitation limits |
| O | RSD is greater than RSDlimit |
| R | RPD outside accepted recovery limits |
| S | Spike Recovery 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 |
| P | Sample pH greater than 2 for VOA and TOC only. |
| RL | Reporting Detection Limit |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** Southwest Geoscience
**Client Sample ID:** MW-14
**Project:** K-51
**Collection Date:** 12/16/2013 10:05:00 AM
**Lab ID:** 1312936-003
**Matrix:** AQUEOUS
**Received Date:** 12/17/2013 10:00:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **JME** | |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 12/23/2013 10:29:25 AM | 10914 |
| Surr: DNOP | 119 | 70.1-140 | | %REC | 1 | 12/23/2013 10:29:25 AM | 10914 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 12/20/2013 5:04:44 PM | R15650 |
| Surr: BFB | 87.5 | 80.4-118 | | %REC | 1 | 12/20/2013 5:04:44 PM | R15650 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | ND | 1.0 | | µg/L | 1 | 12/20/2013 5:04:44 PM | R15650 |
| Toluene | ND | 1.0 | | µg/L | 1 | 12/20/2013 5:04:44 PM | R15650 |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 12/20/2013 5:04:44 PM | R15650 |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 12/20/2013 5:04:44 PM | R15650 |
| Surr: 4-Bromofluorobenzene | 102 | 85-136 | | %REC | 1 | 12/20/2013 5:04:44 PM | R15650 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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:** 12/16/2013 11:55:00 AM
**Lab ID:** 1312936-004
**Matrix:** AQUEOUS
**Received Date:** 12/17/2013 10:00:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 8015D: DIESEL RANGE** | | | | | | Analyst: **JME** | |
| Diesel Range Organics (DRO) | 4.2 | 1.0 | | mg/L | 1 | 12/23/2013 10:51:22 AM | 10914 |
| Surr: DNOP | 130 | 70.1-140 | | %REC | 1 | 12/23/2013 10:51:22 AM | 10914 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | 1.4 | 0.050 | | mg/L | 1 | 12/20/2013 5:35:01 PM | R15650 |
| Surr: BFB | 285 | 80.4-118 | S | %REC | 1 | 12/20/2013 5:35:01 PM | R15650 |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** | |
| Benzene | 160 | 5.0 | | µg/L | 5 | 12/21/2013 1:26:23 PM | R15667 |
| Toluene | ND | 1.0 | | µg/L | 1 | 12/20/2013 5:35:01 PM | R15650 |
| Ethylbenzene | 37 | 1.0 | | µg/L | 1 | 12/20/2013 5:35:01 PM | R15650 |
| Xylenes, Total | 12 | 2.0 | | µg/L | 1 | 12/20/2013 5:35:01 PM | R15650 |
| Surr: 4-Bromofluorobenzene | 132 | 85-136 | | %REC | 1 | 12/20/2013 5:35:01 PM | R15650 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**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 |
| O | RSD is greater than RSDlimit | P | Sample pH greater than 2 for VOA and TOC only. |
| 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#: **1312936**

***23-Dec-13***

**Client:** Southwest Geoscience

**Project:** K-51

| Sample ID: **MB-10914** | SampType: **MBLK** | TestCode: **EPA Method 8015D: Diesel Range** |
|---|---|---|
| Client ID: **PBW** | Batch ID: **10914** | RunNo: **15679** |
| Prep Date: **12/20/2013** | Analysis Date: **12/23/2013** | SeqNo: **452255** 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 | 1.2 | | 1.000 | | 120 | 70.1 | 140 | | | |

| Sample ID: **LCS-10914** | SampType: **LCS** | TestCode: **EPA Method 8015D: Diesel Range** |
|---|---|---|
| Client ID: **LCSW** | Batch ID: **10914** | RunNo: **15679** |
| Prep Date: **12/20/2013** | Analysis Date: **12/23/2013** | SeqNo: **452256** Units: **mg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | 6.5 | 1.0 | 5.000 | 0 | 130 | 73.3 | 145 | | | |
| Surr: DNOP | 0.66 | | 0.5000 | | 132 | 70.1 | 140 | | | |

| Sample ID: **LCSD-10914** | SampType: **LCSD** | TestCode: **EPA Method 8015D: Diesel Range** |
|---|---|---|
| Client ID: **LCSS02** | Batch ID: **10914** | RunNo: **15679** |
| Prep Date: **12/20/2013** | Analysis Date: **12/23/2013** | SeqNo: **452257** Units: **mg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | 6.7 | 1.0 | 5.000 | 0 | 134 | 73.3 | 145 | 3.33 | 20 | |
| Surr: DNOP | 0.66 | | 0.5000 | | 132 | 70.1 | 140 | 0 | 0 | |

**Qualifiers:**

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery 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
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: **1312936**

***23-Dec-13***

**Client:** Southwest Geoscience

**Project:** K-51

| Sample ID: **B25** | SampType: **MBLK** | TestCode: **EPA Method 8015D: Gasoline Range** |
|---|---|---|
| Client ID: **PBW** | Batch ID: **R15650** | RunNo: **15650** |
| Prep Date: | Analysis Date: **12/20/2013** | SeqNo: **451471** 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 | 16 | | 20.00 | | 80.7 | 80.4 | 118 | | | |

| Sample ID: **2.5UG GRO LCS** | SampType: **LCS** | TestCode: **EPA Method 8015D: Gasoline Range** |
|---|---|---|
| Client ID: **LCSW** | Batch ID: **R15650** | RunNo: **15650** |
| Prep Date: | Analysis Date: **12/20/2013** | SeqNo: **451472** 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 | 108 | 80 | 120 | | | |
| Surr: BFB | 19 | | 20.00 | | 92.5 | 80.4 | 118 | | | |

| Sample ID: **1312936-001AMS** | SampType: **MS** | TestCode: **EPA Method 8015D: Gasoline Range** |
|---|---|---|
| Client ID: **MW-1** | Batch ID: **R15650** | RunNo: **15650** |
| Prep Date: | Analysis Date: **12/20/2013** | SeqNo: **451474** Units: **mg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Gasoline Range Organics (GRO) | 0.74 | 0.050 | 0.5000 | 0.1790 | 112 | 67.7 | 128 | | | |
| Surr: BFB | 21 | | 20.00 | | 104 | 80.4 | 118 | | | |

| Sample ID: **1312936-001AMSD** | SampType: **MSD** | TestCode: **EPA Method 8015D: Gasoline Range** |
|---|---|---|
| Client ID: **MW-1** | Batch ID: **R15650** | RunNo: **15650** |
| Prep Date: | Analysis Date: **12/20/2013** | SeqNo: **451475** Units: **mg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Gasoline Range Organics (GRO) | 0.72 | 0.050 | 0.5000 | 0.1790 | 108 | 67.7 | 128 | 2.85 | 20 | |
| Surr: BFB | 23 | | 20.00 | | 117 | 80.4 | 118 | 0 | 0 | |

**Qualifiers:**

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- S Spike Recovery 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
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: **1312936**

***23-Dec-13***

**Client:** Southwest Geoscience

**Project:** K-51

| Sample ID: **B25** | SampType: **MBLK** | TestCode: **EPA Method 8021B: Volatiles** |
|---|---|---|
| Client ID: **PBW** | Batch ID: **R15650** | RunNo: **15650** |
| Prep Date: | Analysis Date: **12/20/2013** | SeqNo: **451492** 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 | 18 | | 20.00 | | 89.6 | 85 | 136 | | | |

| Sample ID: **100NG BTEX LCS** | SampType: **LCS** | TestCode: **EPA Method 8021B: Volatiles** |
|---|---|---|
| Client ID: **LCSW** | Batch ID: **R15650** | RunNo: **15650** |
| Prep Date: | Analysis Date: **12/20/2013** | SeqNo: **451493** Units: **µg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 22 | 1.0 | 20.00 | 0 | 108 | 80 | 120 | | | |
| Toluene | 21 | 1.0 | 20.00 | 0 | 107 | 80 | 120 | | | |
| Ethylbenzene | 22 | 1.0 | 20.00 | 0 | 108 | 80 | 120 | | | |
| Xylenes, Total | 66 | 2.0 | 60.00 | 0 | 110 | 80 | 120 | | | |
| Surr: 4-Bromofluorobenzene | 19 | | 20.00 | | 92.6 | 85 | 136 | | | |

| Sample ID: **1312936-002AMS** | SampType: **MS** | TestCode: **EPA Method 8021B: Volatiles** |
|---|---|---|
| Client ID: **MW-20** | Batch ID: **R15650** | RunNo: **15650** |
| Prep Date: | Analysis Date: **12/20/2013** | SeqNo: **451496** Units: **µg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 22 | 1.0 | 20.00 | 0.2820 | 108 | 73.4 | 119 | | | |
| Toluene | 22 | 1.0 | 20.00 | 0 | 109 | 80 | 120 | | | |
| Ethylbenzene | 22 | 1.0 | 20.00 | 0 | 109 | 80 | 120 | | | |
| Xylenes, Total | 66 | 2.0 | 60.00 | 0 | 111 | 80 | 120 | | | |
| Surr: 4-Bromofluorobenzene | 22 | | 20.00 | | 109 | 85 | 136 | | | |

| Sample ID: **1312936-002AMSD** | SampType: **MSD** | TestCode: **EPA Method 8021B: Volatiles** |
|---|---|---|
| Client ID: **MW-20** | Batch ID: **R15650** | RunNo: **15650** |
| Prep Date: | Analysis Date: **12/20/2013** | SeqNo: **451497** Units: **µg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 22 | 1.0 | 20.00 | 0.2820 | 107 | 73.4 | 119 | 0.973 | 20 | |
| Toluene | 22 | 1.0 | 20.00 | 0 | 108 | 80 | 120 | 1.29 | 20 | |
| Ethylbenzene | 22 | 1.0 | 20.00 | 0 | 108 | 80 | 120 | 1.30 | 20 | |
| Xylenes, Total | 66 | 2.0 | 60.00 | 0 | 110 | 80 | 120 | 1.10 | 20 | |
| Surr: 4-Bromofluorobenzene | 22 | | 20.00 | | 110 | 85 | 136 | 0 | 0 | |

**Qualifiers:**

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- S Spike Recovery 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
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: **1312936**

***23-Dec-13***

**Client:** Southwest Geoscience

**Project:** K-51

| Sample ID: **5ML RB** | SampType: **MBLK** | TestCode: **EPA Method 8021B: Volatiles** |
|---|---|---|
| Client ID: **PBW** | Batch ID: **R15667** | RunNo: **15667** |
| Prep Date: | Analysis Date: **12/21/2013** | SeqNo: **451694** Units: **µg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | ND | 1.0 | | | | | | | | |
| Surr: 4-Bromofluorobenzene | 20 | | 20.00 | | 100 | 85 | 136 | | | |

| Sample ID: **100NG BTEX LCS** | SampType: **LCS** | TestCode: **EPA Method 8021B: Volatiles** |
|---|---|---|
| Client ID: **LCSW** | Batch ID: **R15667** | RunNo: **15667** |
| Prep Date: | Analysis Date: **12/21/2013** | SeqNo: **451695** Units: **µg/L** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 22 | 1.0 | 20.00 | 0 | 109 | 80 | 120 | | | |
| Surr: 4-Bromofluorobenzene | 21 | | 20.00 | | 103 | 85 | 136 | | | |

**Qualifiers:**

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery 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
- P Sample pH greater than 2 for VOA and TOC only.
- 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: 1312936  RcptNo: 1

Received by/date: MB 12/17/13

Logged By: Anne Thorne  12/17/2013 10:00:00 AM  Anne Thorne

Completed By: Anne Thorne  12/20/2013  Anne Thorne

Reviewed By: 12/20/13

## 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 | 2.6 | Good | Yes | | | |

# CHAIN OF CUSTODY RECORD

**Southwest GEOSCIENCE**
Environmental & Hydrogeologic Consultants

Office Location: AZTEC, NM
Project Manager: KYLE SUMMERS

Laboratory: HALL
Address: ABQ
Contact: FREEMAN
Phone:
PO/SO #: 04104G003

Lab use only
Due Date:
Temp. of coolers when received (C°): 2.6°
1 | 2 | 3 | 4 | 5
Page 1 of 1

Sampler's Name: AARON BRYANT
Sampler's Signature: Aaron Bryant

Proj. No.: 04104G003
Project Name: K-51

| 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 | ANALYSIS REQUESTED: BTEX 8021 | TPH 8015 DRO/GRO | Lab Sample ID (Lab Use Only) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W | 12/16/13 | 1055 | | X | MW-1 | | | 5 | | | | X | X | 1312936-001 |
| W | 12/16/13 | 1230 | | X | MW-20 | | | 5 | | | | X | X | -002 |
| W | 12/16/13 | 1005 | | X | MW-14 | | | 5 | | | | X | X | -003 |
| W | 12/16/13 | 1155 | | X | MW-19 | | | 5 | | | | X | X | -004 |

NFJ
AB

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

| Relinquished by (Signature) | Date: | Time: | Received by: (Signature) | Date: | Time: |
|---|---|---|---|---|---|
| | 12/16/13 | 4:20 | | 12/16/13 | 1620 |
| | 12/16/13 | 1750 | | 12/17/13 | 1000 |
| | | | | | |
| | | | | | |

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