# 3R – 448

# 2009 GWMR

# 12 / 07 / 2009

Animas Environmental Services, LLC

624 E. Comanche . Farmington, NM 87401 . Tel 505-564-2281 . Fax 505-324-2022 . www.animasenvironmental.com

December 7, 2009

Brad Jones
Oil Conservation Division
1220 S. St. Francis Drive
Santa Fe, NM 87505

Dixon Sandoval
Jicarilla Apache Nation
Environmental Protection Office
P.O. Box 507
Dulce, NM 87528

**Re: Periodic Progress Report for the Benson-Montin-Greer Highway 537 Truck Receiving Station Llaves Pipeline 2007 Oil Spill, Rio Arriba County, New Mexico**

Dear Sirs:

Animas Environmental Services, LLC (AES), on behalf of Benson-Montin-Greer Drilling Corporation (BMG), conducted groundwater sampling of monitor wells at the BMG Highway 537 Truck Receiving Station 2007 Spill Location on October 13, 2009. Work was conducted in accordance with a Sampling and Analysis Plan (SAP) submitted to the Jicarilla Apache Nation Environmental Protection Office (JEPO) and the U.S. Environmental Protection Agency (USEPA) on April 4, 2007.

The release originated in March 2007 on the Schmitz Ranch within the SW¼ NW¼ of Section 18, T25N, R3W (latitude and longitude recorded as N36° 23' 59.781" and W107° 11' 26.450"). Petroleum hydrocarbons flowed into the Los Ojitos Arroyo and then downstream to a livestock pond located on Jicarilla Apache Nation Land within the SE¼ SE¼ of Section 13, T25N, R4W (latitude and longitude recorded as N36° 23' 40.417" and W107° 11' 53.337"), Rio Arriba County, New Mexico. The locations of the release and flow route are shown on Figures 1 and 2.

## 1.0 Site History

On March 7, 2007, Schmitz Ranch personnel observed oil leaking into the Los Ojitos Canyon Arroyo. BMG personnel discovered that a small corrosion hole in the Llaves Pipeline, which runs parallel to the south side of Highway 537, was the source of the

leaking oil, and the pipeline was removed from service until the pipeline was repaired and clean up action was completed.

Approximately 25,230 cubic yards of petroleum-contaminated soils were excavated from the origin of the oil pipeline leak toward the Los Ojitos Arroyo and within the arroyo during March and April 2007. The soils were then transported off-site to a New Mexico Oil Conservation Division (NMOCD) permitted facility, the Schmitz Ranch Landfarm. Confirmation samples were collected by AES personnel for soil confirmation during excavation activities and from surface water at Vigil Pond on April 3, 2007. Excavation and clean up efforts are discussed in detail within the SAP prepared by AES and dated April 5, 2007, which was submitted to the JEPO and USEPA.

On July 16 and 17, 2007, AES installed 11 monitor wells along the route of the release in order to define the lateral and vertical extent of near surface and subsurface soil contamination.

Quarterly groundwater sampling has been conducted throughout 2007, 2008, and early 2009. Analytical results from groundwater samples collected during the July 2009 sampling event showed that benzene, toluene, ethylbenzene, and xylene (BTEX) and total petroleum hydrocarbons (TPH) $C_6$-$C_{36}$ concentrations in all wells sampled remained below laboratory detection limits. During this event MW-8, MW-9, and MW-11 were not sampled. Details of groundwater sampling were presented within the AES *Periodic Progress Report*, dated August 20, 2009.

## 2.0 Groundwater Monitoring and Sampling, October 2009

AES personnel conducted groundwater monitoring and sampling at the project area on October 13, 2009. Groundwater samples were laboratory analyzed for BTEX and TPH $C_6$-$C_{36}$ per EPA Methods 8021/8015 at Hall Environmental Analysis Laboratory, Albuquerque, New Mexico.

### *2.1 Groundwater Measurements and Water Quality Data*

During the October 2009 sampling event, groundwater measurements were recorded for MW-1 through MW-7 and MW-10. Monitor wells MW-8, MW-9, and MW-11 were destroyed and therefore were not measured. Groundwater elevations were measured with a Keck water level with accuracy to 0.01 foot and found to range from 7,028.48 feet above mean sea level (amsl) in MW-10 and 7,040.52 feet amsl in MW-4. Groundwater elevations generally increased approximately 0.8 feet across the project area since the last sampling event in July 2009.

Water quality measurements were made with an YSI Water Quality Meter, and temperature ranged from 12.37°C in MW-3 and 15.41°C in MW-7. Groundwater pH measurements ranged from 6.88 to 7.58, and dissolved oxygen concentrations were between 1.14 mg/L in MW-5 and 3.50 mg/L in MW-4. Oxidation reduction potential (ORP) measurements were between 18.4 mV and 90.6 mV, and conductivity readings were between 1.837 mS and 10.92 mS. Depth to groundwater measurements and water quality data are presented in Table 1. Water Sample Collection Forms are included as Appendix A.

### *2.2 Groundwater Analytical Results*

Groundwater samples were collected by AES personnel from MW-1 through MW-7 and MW-10 for laboratory analysis on October 13, 2009. In each of the wells sampled, analytical results for BTEX showed that concentrations remained below laboratory detection limits, and therefore also below applicable New Mexico Water Quality Control Commission (WQCC) standards for BTEX. TPH concentrations were also below laboratory detection limits in each of the wells sampled. Tabulated laboratory analytical results are included in Table 2, and laboratory analytical reports are included in Appendix A.

## 3.0 Conclusions and Recommendations

Petroleum hydrocarbon impacts to groundwater have not been detected since the monitor wells were installed in July 2007. Groundwater laboratory analytical results continue to show non-detectable concentrations of BTEX and TPH for all seven groundwater sampling events conducted to date. AES has scheduled the next quarterly sampling event to occur in early January 2010. If the results from the January 2010 sampling event also show concentrations below laboratory detection limits or below applicable standards, AES will recommend that the site be considered for No Further Action.

If you have any questions about site conditions or this report, please feel free to contact Elizabeth McNally or Ross Kennemer at (505) 564-2281.

Sincerely,

Corwin Lameman
Geologist Intern

Elizabeth McNally, P.E.

Attachments: Tables

Table 1. Summary of Groundwater and Water Quality Data
Table 2. Summary of Groundwater Analytical Results

Figures

Figure 1. Topographic Site Location Map
Figure 2. General Site Plan

Appendices

Appendix A. Water Sample Collection Forms
Laboratory Analytical Reports

Cc: Brandon Powell
New Mexico Oil Conservation Division
1000 Rio Brazos Rd.
Aztec, NM 87410

Mike Dimond
Benson-Montin-Greer Drilling Corp.
4900 College Blvd
Farmington NM 87402

File: 2009\BMG\Hwy. 537 2007Spill\Reports\gc Letter Report 120709

TABLE 1
SUMMARY OF GROUNDWATER MEASUREMENT AND WATER QUALITY DATA
BMG HWY 537 LLAVES PIPELINE 2007 OIL SPILL
Rio Arriba County, New Mexico

| Well ID | Date Sampled | Depth to Water (ft) | Surveyed TOC (ft) | GW Elev. (ft) | pH | Conductivity (mS) | DO (mg/L) | Temperature (C) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|---|
| **MW-1** | 10-Aug-07 | 47.38 | 7086.81 | 7039.43 | 7.36 | 1.998 | 3.62 | 16.61 | -121.0 |
| **MW-1** | 27-Mar-08 | 36.97 | 7086.81 | 7049.84 | 7.78 | 3.419 | 5.62 | 13.48 | 122.3 |
| **MW-1** | 25-Sep-08 | 47.12 | 7086.81 | 7039.69 | 7.02 | 3.859 | 2.31 | 16.76 | 30.0 |
| **MW-1** | 31-Dec-08 | 47.26 | 7086.81 | 7039.55 | 6.25 | 3.925 | NM | 11.43 | 104.9 |
| **MW-1** | 06-Apr-09 | 47.21 | 7086.81 | 7039.60 | 7.22 | 4.063 | 1.97 | 12.45 | 9.4 |
| **MW-1** | 07-Jul-09 | 47.15 | 7086.81 | 7039.66 | 6.91 | 3.226 | 2.21 | 19.35 | -9.1 |
| **MW-1** | 13-Oct-09 | 47.50 | 7086.81 | 7039.31 | 7.04 | 2.107 | 3.31 | 13.05 | 90.6 |
| | | | | | | | | | |
| **MW-2** | 10-Aug-07 | 36.53 | 7076.43 | 7039.90 | 7.44 | 2.216 | 2.34 | 17.09 | -138.0 |
| **MW-2** | 27-Mar-08 | 36.19 | 7076.43 | 7040.24 | 7.13 | 4.089 | 1.16 | 13.05 | 76.6 |
| **MW-2** | 25-Sep-08 | 36.34 | 7076.43 | 7040.09 | 6.88 | 3.415 | 6.48 | 15.05 | 60.1 |
| **MW-2** | 05-Jan-09 | 36.43 | 7076.43 | 7040.00 | NM | | | | |
| **MW-2** | 06-Apr-09 | 36.29 | 7076.43 | 7040.14 | 7.37 | 5.308 | 2.47 | 13.74 | 8.8 |
| **MW-2** | 07-Jul-09 | 36.29 | 7076.43 | 7040.14 | 6.90 | 4.025 | 2.00 | 16.12 | -26.8 |
| **MW-2** | 13-Oct-09 | 36.70 | 7076.43 | 7039.73 | 6.92 | 2.529 | 2.91 | 12.84 | 80.0 |
| | | | | | | | | | |
| **MW-3** | 10-Aug-07 | 29.35 | 7069.66 | 7040.31 | 7.57 | 1.797 | 2.41 | 16.91 | -165.1 |
| **MW-3** | 27-Mar-08 | 28.94 | 7069.66 | 7040.72 | 7.38 | 2.735 | 0.86 | 13.16 | 67.6 |
| **MW-3** | 25-Sep-08 | NM | 7069.66 | NM | 6.74 | 2.776 | 2.61 | 14.35 | 50.1 |
| **MW-3** | 05-Jan-09 | 29.51 | 7069.66 | 7040.15 | NM | | | | |
| **MW-3** | 06-Apr-09 | 29.11 | 7069.66 | 7040.55 | 6.98 | 3.233 | 1.63 | 12.88 | 10.9 |
| **MW-3** | 07-Jul-09 | 29.15 | 7069.66 | 7040.51 | 7.12 | 2.858 | 1.30 | 15.44 | -24.9 |
| **MW-3** | 13-Oct-09 | 29.64 | 7069.66 | 7040.02 | 7.11 | 2.299 | 1.71 | 12.37 | 60.5 |
| | | | | | | | | | |
| **MW-4** | 10-Aug-07 | 22.34 | 7068.11 | 7045.77 | 7.49 | 1.517 | 2.40 | 14.47 | -164.6 |
| **MW-4** | 27-Mar-08 | 26.92 | 7068.11 | 7041.19 | 7.46 | 2.340 | 1.89 | 12.40 | 76.1 |

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| Well ID | Date Sampled | Depth to Water (ft) | Surveyed TOC (ft) | GW Elev. (ft) | pH | Conductivity (mS) | DO (mg/L) | Temperature (C) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|---|
| **MW-4** | 25-Sep-08 | 27.21 | 7068.11 | 7040.90 | 6.89 | 2.434 | 3.70 | 14.76 | 43.1 |
| **MW-4** | 06-Jan-09 | 27.23 | 7068.11 | 7040.88 | 6.71 | 2.902 | 4.36 | 11.91 | 230.9 |
| **MW-4** | 06-Apr-09 | 27.06 | 7068.11 | 7041.05 | 6.92 | 2.828 | 2.07 | 13.62 | 8.3 |
| **MW-4** | 07-Jul-09 | 27.14 | 7068.11 | 7040.97 | 7.13 | 3.301 | 2.29 | 17.52 | -14.0 |
| **MW-4** | 13-Oct-09 | 27.59 | 7068.11 | 7040.52 | 7.20 | 2.070 | 3.50 | 12.71 | 59.4 |
| | | | | | | | | | |
| **MW-5** | 10-Aug-07 | 20.44 | 7059.97 | 7039.53 | 7.81 | 7.155 | 2.40 | 15.72 | -122.0 |
| **MW-5** | 28-Mar-08 | 19.80 | 7059.97 | 7040.17 | NM - LOW YIELD | | | | |
| **MW-5** | 25-Sep-08 | 20.26 | 7059.97 | 7039.71 | 6.97 | 19.17 | 1.62 | 16.26 | 9.9 |
| **MW-5** | 06-Jan-09 | 20.16 | 7059.97 | 7039.81 | 6.52 | 23.84 | 2.22 | 8.91 | 231.2 |
| **MW-5** | 06-Apr-09 | 20.11 | 7059.97 | 7039.86 | 7.01 | 22.69 | 2.52 | 12.10 | 9.7 |
| **MW-5** | 07-Jul-09 | 20.07 | 7059.97 | 7039.90 | 7.60 | 18.17 | 1.20 | 15.57 | -10.6 |
| **MW-5** | 13-Oct-09 | 20.48 | 7059.97 | 7039.49 | 7.58 | 10.92 | 1.14 | 12.65 | 60.2 |
| | | | | | | | | | |
| **MW-6** | 10-Aug-07 | 22.32 | 7061.97 | 7039.65 | 7.47 | 1.842 | 2.11 | 17.01 | -138.7 |
| **MW-6** | 28-Mar-08 | 21.61 | 7061.97 | 7040.36 | 7.34 | 3.261 | 3.22 | 14.11 | 303.9 |
| **MW-6** | 25-Sep-08 | 22.45 | 7061.97 | 7039.52 | 6.76 | 3.092 | 2.92 | 16.55 | 32.4 |
| **MW-6** | 06-Jan-09 | 22.54 | 7061.97 | 7039.43 | 6.94 | 4.537 | 2.77 | 7.77 | 21.8 |
| **MW-6** | 06-Apr-09 | 22.24 | 7061.97 | 7039.73 | 7.19 | 4.246 | 2.08 | 12.77 | 10.6 |
| **MW-6** | 07-Jul-09 | 22.28 | 7061.97 | 7039.69 | 7.11 | 2.553 | 2.09 | 15.64 | -15.2 |
| **MW-6** | 13-Oct-09 | 22.89 | 7061.97 | 7039.08 | 7.23 | 3.545 | 1.85 | 13.42 | 49.7 |
| | | | | | | | | | |
| **MW-7** | 13-Aug-07 | 13.31 | 7051.30 | 7037.99 | NM - BENTONITE FOUND IN WELL | | | | |
| **MW-7** | 28-Mar-08 | 12.11 | 7051.30 | 7039.19 | NM - LOW YIELD | | | | |
| **MW-7** | 25-Sep-08 | 13.64 | 7051.30 | 7037.66 | 6.98 | 3.308 | 3.19 | 15.65 | 44.9 |
| **MW-7** | 07-Jan-09 | NM | 7051.30 | | NM - WATER IN WELL FROZEN | | | | |

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| Well ID | Date Sampled | Depth to Water (ft) | Surveyed TOC (ft) | GW Elev. (ft) | pH | Conductivity (mS) | DO (mg/L) | Temperature (C) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|---|
| **MW-7** | 06-Apr-09 | 13.32 | 7051.30 | 7037.98 | 6.60 | 3.191 | 2.29 | 10.78 | 13.1 |
| **MW-7** | 07-Jul-09 | 13.27 | 7051.30 | 7038.03 | 6.73 | 2.429 | 1.61 | 16.65 | -18.4 |
| **MW-7** | 13-Oct-09 | 14.16 | 7051.30 | 7037.14 | 6.88 | 1.837 | 1.66 | 15.41 | 60.2 |
| | | | | | | | | | |
| **MW-8** | 13-Aug-07 | 13.39 | 7049.96 | 7036.57 | 7.33 | 1.550 | 3.02 | 15.97 | -26.6 |
| **MW-8** | 28-Mar-08 | 11.44 | 7049.96 | 7038.52 | NM - LOW YIELD | | | | |
| **MW-8** | 25-Sep-08 | 13.55 | 7049.96 | 7036.41 | 6.50 | 2.090 | 1.56 | 16.77 | 17.4 |
| **MW-8** | 06-Jan-09 | 13.65 | 7049.96 | 7036.31 | 6.48 | 2.430 | 2.25 | 6.78 | 41.0 |
| **MW-8** | 06-Apr-09 | | 7049.96 | | NM - OBSTRUCTION IN WELL | | | | |
| **MW-8** | 07-Jul-09 | NM - WELL DESTROYED | | | | | | | |
| | | | | | | | | | |
| **MW-9** | 13-Aug-07 | | 7045.47 | 7045.47 | NM - WELL DRY | | | | |
| **MW-9** | 28-Mar-08 | | 7045.47 | 7063.00 | NM - WELL DAMAGED | | | | |
| **MW-9** | 25-Sep-08 | 12.74 | 7045.47 | 7032.73 | 6.85 | 14.65 | 3.62 | 16.54 | 40.5 |
| **MW-9** | 07-Jan-09 | NM - WELL DESTROYED | | | | | | | |
| | | | | | | | | | |
| **MW-10** | 10-Aug-07 | 5.95 | 7038.05 | 7032.10 | 7.17 | 2.727 | 2.17 | 21.07 | -138.0 |
| **MW-10** | 28-Mar-08 | 5.57 | 7038.05 | 7032.48 | NM - WELL DAMAGED | | | | |
| **MW-10** | 25-Sep-08 | 8.66 | 7038.05 | 7029.39 | 7.17 | 9.857 | 2.41 | 14.83 | -5.8 |
| **MW-10** | 07-Jan-09 | | 7038.05 | | NM - WATER IN WELL FROZEN | | | | |
| **MW-10** | 06-Apr-09 | 7.61 | 7038.05 | 7030.44 | 6.74 | 4.835 | 1.90 | 9.44 | 14.5 |
| **MW-10** | 07-Jul-09 | 7.09 | 7038.05 | 7030.96 | 7.15 | 3.255 | 1.45 | 21.37 | -22.6 |
| **MW-10** | 13-Oct-09 | 9.57 | 7038.05 | 7028.48 | 7.05 | 6.185 | 1.36 | 14.20 | 18.4 |
| | | | | | | | | | |
| **MW-11** | 10-Aug-07 | 16.78 | 7042.00 | 7025.22 | 7.45 | 10.34 | 11.21 | 22.98 | -135.7 |
| **MW-11** | 28-Mar-08 | 11.59 | 7042.00 | 7030.41 | 7.07 | 10.14 | 5.78 | 10.38 | 495.8 |

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| Well ID | Date Sampled | Depth to Water (ft) | Surveyed TOC (ft) | GW Elev. (ft) | pH | Conductivity (mS) | DO (mg/L) | Temperature (C) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|---|
| **MW-11** | 28-Mar-08 | 11.59 | 7042.00 | 7030.41 | NM - WELL DESTROYED | | | | |
| **MW-11** | 07-Jan-09 | DRY | 7042.00 | | NM - WELL DRY | | | | |
| **MW-11** | 06-Apr-09 | NM - WELL DESTROYED | | | | | | | |

**NOTE:** NM = NOT MEASURED

TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
BMG HWY 537 LLAVES PIPELINE 2007 OIL SPILL
Rio Arriba County, New Mexico

| Well ID | Date Sampled | Benzene (µg/L) | Toluene (µg/L) | Ethyl-benzene (µg/L) | Total Xylenes (µg/L) | DRO (mg/L) | GRO (mg/L) |
|---|---|---|---|---|---|---|---|
| ***Analytical Method*** | | **8021B** | **8021B** | **8021B** | **8021B** | **8015B** | **8015B** |
| ***New Mexico WQCC*** | | ***10*** | ***750*** | ***750*** | ***620*** | ***NE*** | ***NE*** |
| **MW-1** | 10-Aug-07 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-1** | 27-Mar-08 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-1** | 25-Sep-08 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-1** | 31-Dec-08 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-1** | 06-Apr-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-1** | 07-Jul-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-1** | 13-Oct-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| | | | | | | | |
| **MW-2** | 10-Aug-07 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-2** | 27-Mar-08 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-2** | 25-Sep-08 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-2** | 05-Jan-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-2** | 06-Apr-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-2** | 07-Jul-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-2** | 13-Oct-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| | | | | | | | |
| **MW-3** | 10-Aug-07 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-3** | 27-Mar-08 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-3** | 25-Sep-08 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-3** | 05-Jan-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-3** | 06-Apr-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-3** | 07-Jul-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-3** | 13-Oct-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| | | | | | | | |
| **MW-4** | 10-Aug-07 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-4** | 27-Mar-08 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-4** | 25-Sep-08 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-4** | 06-Jan-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-4** | 06-Apr-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-4** | 07-Jul-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-4** | 10-13-090 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| | | | | | | | |
| **MW-5** | 13-Aug-07 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-5** | 28-Mar-08 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-5** | 25-Sep-08 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-5** | 06-Jan-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-5** | 06-Apr-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |

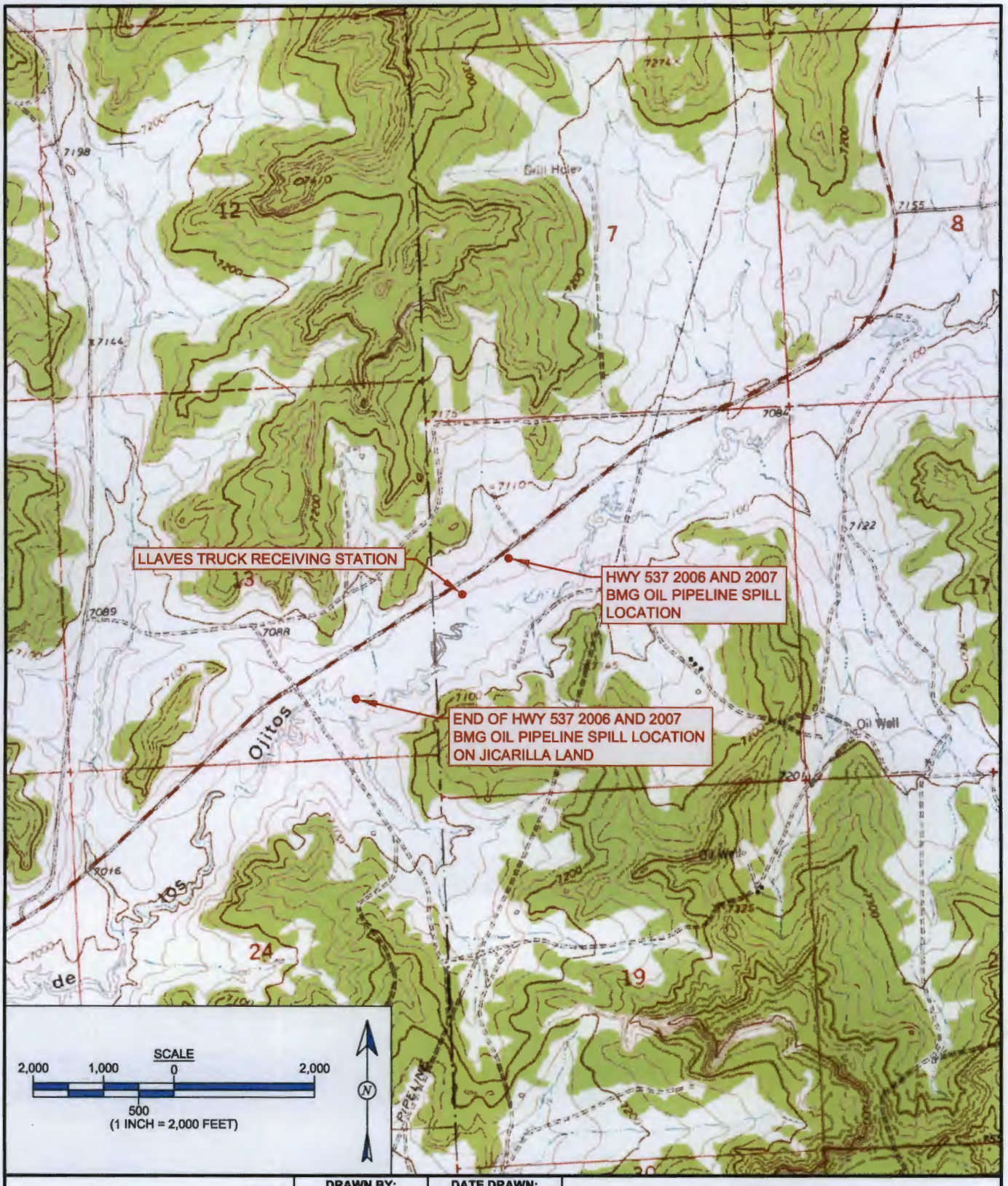
TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
BMG HWY 537 LLAVES PIPELINE 2007 OIL SPILL
Rio Arriba County, New Mexico

| Well ID | Date Sampled | Benzene (µg/L) | Toluene (µg/L) | Ethyl-benzene (µg/L) | Total Xylenes (µg/L) | DRO (mg/L) | GRO (mg/L) |
|---|---|---|---|---|---|---|---|
| ***Analytical Method*** | | **8021B** | **8021B** | **8021B** | **8021B** | **8015B** | **8015B** |
| ***New Mexico WQCC*** | | ***10*** | ***750*** | ***750*** | ***620*** | ***NE*** | ***NE*** |
| **MW-5** | 07-Jul-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-5** | 13-Oct-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| | | | | | | | |
| **MW-6** | 13-Aug-07 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-6** | 28-Mar-08 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-6** | 25-Sep-08 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-6** | 06-Jan-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-6** | 06-Apr-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-6** | 07-Jul-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-6** | 13-Oct-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| | | | | | | | |
| **MW-7** | 13-Aug-07 | NS - Bentonite Found in Well | | | | | |
| **MW-7** | 28-Mar-08 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-7** | 25-Sep-08 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-7** | 07-Jan-09 | NS -Water Frozen in Well | | | | | |
| **MW-7** | 06-Apr-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-7** | 07-Jul-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-7** | 13-Oct-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| | | | | | | | |
| **MW-8** | 13-Aug-07 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-8** | 28-Mar-08 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-8** | 25-Sep-08 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-8** | 06-Jan-08 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-8** | 06-Apr-09 | NS - Obstruction in Well | | | | | |
| **MW-8** | 07-Jul-09 | NS - Well Destroyed | | | | | |
| | | | | | | | |
| **MW-9** | 13-Aug-07 | NS - Well Dry | | | | | |
| **MW-9** | 28-Mar-08 | NS - Well Damaged | | | | | |
| **MW-9** | 25-Sep-08 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-9** | 07-Jan-09 | NS - Well Destroyed | | | | | |
| | | | | | | | |
| **MW-10** | 10-Aug-07 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-10** | 28-Mar-08 | NS - Well Damaged | | | | | |
| **MW-10** | 25-Sep-08 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-10** | 07-Jan-09 | NS - Water Frozen in Well | | | | | |
| **MW-10** | 06-Apr-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-10** | 07-Jul-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |

TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
BMG HWY 537 LLAVES PIPELINE 2007 OIL SPILL
Rio Arriba County, New Mexico

| Well ID | Date Sampled | Benzene (µg/L) | Toluene (µg/L) | Ethyl-benzene (µg/L) | Total Xylenes (µg/L) | DRO (mg/L) | GRO (mg/L) |
|---|---|---|---|---|---|---|---|
| ***Analytical Method*** | | **8021B** | **8021B** | **8021B** | **8021B** | **8015B** | **8015B** |
| ***New Mexico WQCC*** | | ***10*** | ***750*** | ***750*** | ***620*** | ***NE*** | ***NE*** |
| **MW-10** | 13-Oct-09 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| | | | | | | | |
| **MW-11** | 13-Aug-07 | <1.0 | <1.0 | <1.0 | <2.0 | 1.4 | <0.050 |
| **MW-11** | 28-Mar-08 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <0.050 |
| **MW-11** | 25-Sep-08 | NS - Well Destroyed | | | | | |
| **MW-11** | 07-Jan-09 | NS - Well Dry | | | | | |
| **MW-11** | 06-Apr-09 | NS - Well Destroyed | | | | | |

**NOTE:** NS = Not Sampled




| | |
|---|---|
| DRAWN BY: N. Willis | DATE DRAWN: May 5, 2009 |
| REVISIONS BY: C. Lameman | DATE REVISED: October 27, 2009 |
| CHECKED BY: E. McNally | DATE CHECKED: December 7, 2009 |
| APPROVED BY: E. McNally | DATE APPROVED: December 7, 2009 |

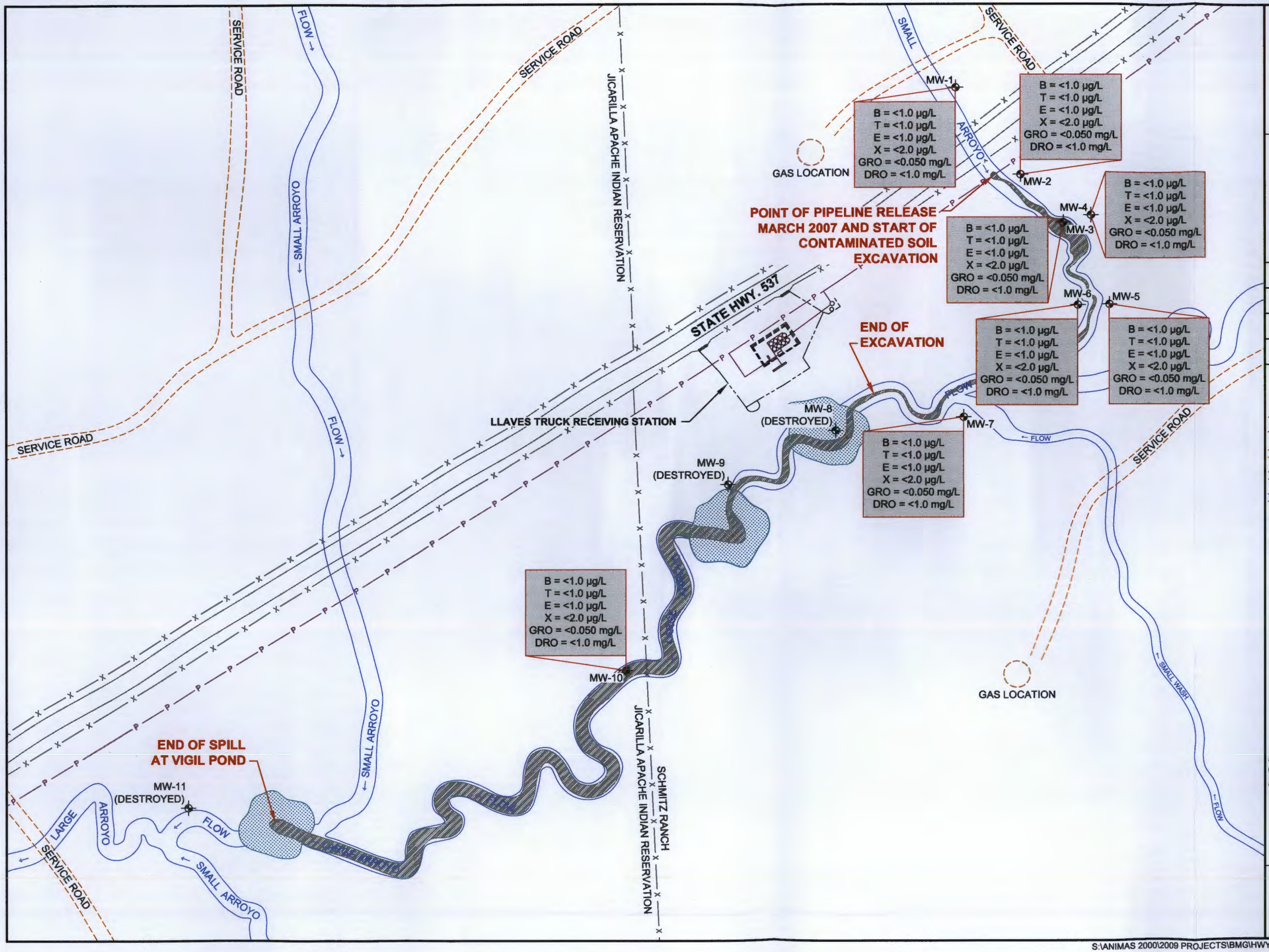
AES
Animas Environmental Services, LLC

**FIGURE 1**
**TOPOGRAPHIC SITE LOCATION MAP**
BMG HIGHWAY 537
TRUCK RECEIVING STATION
LLAVES PIPELINE 2007 OIL SPILL
RIO ARRIBA COUNTY, NEW MEXICO

S:\ANIMAS 2000\2009 PROJECTS\BMG\HWY. 537 2007 SPILL\DRAWINGS\FIGURE 1 TOPOGRAPHICAL SITE LOCATION MAP

# FIGURE 2
## GENERAL SITE PLAN WITH GROUNDWATER CONTAMINANT CONCENTRATIONS OCTOBER 2009

BMG HIGHWAY 537
TRUCK RECEIVING STATION
LLAVES PIPELINE 2007 OIL SPILL
RIO ARRIBA COUNTY, NEW MEXICO




| | |
|---|---|
| **DRAWN BY:** N. Willis | **DATE DRAWN:** March 16, 2009 |
| **REVISIONS BY:** C. Lameman | **DATE REVISED:** October 27, 2009 |
| **CHECKED BY:** D. Watson | **DATE CHECKED:** October 15, 2009 |
| **APPROVED BY:** E. McNally | **DATE APPROVED:** December 7, 2009 |

**LEGEND**

- MONITORING WELL LOCATIONS (INSTALLED JULY 2007)
- FENCE
- BMG LLAVES 4 INCH OIL PIPELINE
- DIRT ROAD
- HIGHWAY
- WASHES AND ARROYOS
- FLOOD PLANS AND WET LANDS
- OIL SPILL ROUTE

| | |
|---|---|
| B | BENZENE |
| T | TOLUENE |
| E | ETHYLBENZENE |
| X | TOTAL XYLENE |
| GRO | GASOLINE RANGE ORGANICS |
| DRO | DIESEL RANGE ORGANICS |
| µg/L | PARTS PER BILLION |
| mg/L | PARTS PER MILLION |
| < | ANALYTE NOT DETECTED ABOVE LISTED METHOD LIMIT |

*NOTE: ALL SAMPLES COLLECTED ON OCTOBER 13, 2009. SAMPLES ANALYZED PER EPA METHOD 8021B AND 8015B.*

SCALE
300 200 0 300
100
(1 INCH = 300 FEET)

S:\ANIMAS 2000\2009 PROJECTS\BMG\HWY. 537 2007 SPILL\DRAWINGS\FIGURE 2 GENERAL SITE PLAN

# DEPTH TO GROUNDWATER MEASUREMENT FORM

**Animas Environmental Services**
624 E. Comanche, Farmington NM 87401
Tel. (505) 564-2281 Fax (505) 324-2022

**Project:** Groundwater Monitoring
**Site:** Hwy 537 2006 and 2007 Spill
**Location:** Rio Arriba County, New Mexico
**Tech:** N. Willis

**Project No.:** AES 070301
**Date:** 10-13-09
**Time:** 1000
**Form:** 1 of 1

| Well I.D. | Time | Depth to NAPL (ft.) | Depth to Water (ft.) | NAPL Thickness (ft.) | Notes / Observations |
|---|---|---|---|---|---|
| MW-1 | 1008 | — | 47.50 | — | |
| MW-2 | 1042 | — | 36.70 | — | |
| MW-3 | 1059 | — | 29.64 | — | |
| MW-4 | 1208 | — | 27.59 | — | |
| MW-5 | 1228 | — | 20.48 | — | |
| MW-6 | 1250 | — | 22.89 | — | |
| MW-7 | 1317 | — | 14.16 | — | |
| MW-8 | — | — | | — | Destroyed |
| MW-9 | — | — | | — | Destroyed |
| MW-10 | 1352 | — | 9.57 | — | |
| MW-11 | — | — | | — | Destroyed |

Wells measured with KECK water level or KECK interface tape, decontaminated between each well measurement.

## MONITORING WELL SAMPLING RECORD

**Monitor Well No:** MW-1

Animas Environmental Services
624 E. Comanche, Farmington NM 87401
Tel. (505) 564-2281 Fax (505) 324-2022

**Site:** Highway 537 2006 and 2007 Spill
**Location:** Rio Arriba County, New Mexico
**Project:** Groundwater Monitoring and Sampling
**Sampling Technician:** N. Willis
**Purge / No Purge:** No Purge
**Well Diameter (in):** 2
**Initial D.T.W. (ft):** _____ **Time:** _____ *(taken at initial gauging of all wells)*
**Confirm D.T.W. (ft):** 47.50 **Time:** 1008 *(taken prior to purging well)*
**Final D.T.W. (ft):** _____ **Time:** _____ *(taken after sample collection)*
**If NAPL Present:** **D.T.P.:** _____ **D.T.W.:** _____ **Thickness:** _____ **Time:** _____

**Project No.:** AES 070302
**Date:** 10-13-09
**Arrival Time:** 1005
**Air Temp:** 63°F
**T.O.C. Elev. (ft):** 7086.81
**Total Well Depth (ft):** 52.93

### Water Quality Parameters - Recorded During Well Purging

| Time | Temp (deg C) | Conductivity (µS) (mS) | DO (mg/L) | pH | ORP (mV) | PURGED VOLUME (see reverse for calc.) | Notes/Observations |
|---|---|---|---|---|---|---|---|
| 1011 | 13.05 | 2.107 | 3.31 | 7.04 | 90.6 | 0.25 | |
| 1016 | ~ | | | | | | Samples Collected |
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### Analytical Parameters (include analysis method and number and type of sample containers)

BTEX per EPA Method 8021 (3 40mL Vials w/ HCl preserve)
TPH C6-C36 per EPA Method 8015B (2 40mL Vials w/ HCl preserve)
TPH C6-C36 per EPA Method 8015B (40mL Vial w/ no preservative)

**Disposal of Purged Water:** _____
**Collected Samples Stored on Ice in Cooler:** _____
**Chain of Custody Record Complete:** _____
**Analytical Laboratory:** Hall Environmental Analysis Laboratory, Albuquerque, NM
**Equipment Used During Sampling:** Keck Water Level or Keck Interface Level, YSI Water Quality Meter and New Disposable Bailer

**Notes/Comments:**

## MONITORING WELL SAMPLING RECORD

**Monitor Well No:** MW-2

Animas Environmental Services
624 E. Comanche, Farmington NM 87401
Tel. (505) 564-2281 Fax (505) 324-2022

**Site:** Highway 537 2006 and 2007 Spill
**Location:** Rio Arriba County, New Mexico
**Project:** Groundwater Monitoring and Sampling
**Sampling Technician:** N. Willis
**Purge / No Purge:** No Purge
**Well Diameter (in):** 2
**Initial D.T.W. (ft):** _____ **Time:** _____ *(taken at initial gauging of all wells)*
**Confirm D.T.W. (ft):** 36.70 **Time:** 1042 *(taken prior to purging well)*
**Final D.T.W. (ft):** _____ **Time:** _____ *(taken after sample collection)*
**If NAPL Present:** **D.T.P.:** _____ **D.T.W.:** _____ **Thickness:** _____ **Time:** _____

**Project No.:** AES 070302
**Date:** 10-13-09
**Arrival Time:** 1026
**Air Temp:** 63°F
**T.O.C. Elev. (ft):** 7076.43
**Total Well Depth (ft):** 47.69

### Water Quality Parameters - Recorded During Well Purging

| Time | Temp (deg C) | Conductivity (µS) (mS) | DO (mg/L) | pH | ORP (mV) | PURGED VOLUME (see reverse for calc.) | Notes/Observations |
|---|---|---|---|---|---|---|---|
| 1044 | 12.84 | 2.529 | 2.91 | 6.92 | 80.0 | 0.25 | |
| 1049 | | | | | | | Samples Collected |
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### Analytical Parameters (include analysis method and number and type of sample containers)

BTEX per EPA Method 8021 (3 40mL Vials w/ HCl preserve)
TPH C6-C36 per EPA Method 8015B (2 40mL Vials w/ HCl preserve)
TPH C6-C36 per EPA Method 8015B (40mL Vial w/ no preservative)

**Disposal of Purged Water:** _____
**Collected Samples Stored on Ice in Cooler:** _____
**Chain of Custody Record Complete:** _____
**Analytical Laboratory:** Hall Environmental Analysis Laboratory, Albuquerque, NM
**Equipment Used During Sampling:** Keck Water Level or Keck Interface Level, YSI Water Quality Meter and New Disposable Bailer

**Notes/Comments:**

## MONITORING WELL SAMPLING RECORD

**Monitor Well No:** MW-3

Animas Environmental Services
624 E. Comanche, Farmington NM 87401
Tel. (505) 564-2281 Fax (505) 324-2022

**Site:** Highway 537 2006 and 2007 Spill
**Location:** Rio Arriba County, New Mexico
**Project:** Groundwater Monitoring and Sampling
**Sampling Technician:** N. Willis
**Purge / No Purge:** No Purge
**Well Diameter (in):** 2
**Initial D.T.W. (ft):** _____ **Time:** _____ *(taken at initial gauging of all wells)*
**Confirm D.T.W. (ft):** 29.64 **Time:** 1059 *(taken prior to purging well)*
**Final D.T.W. (ft):** _____ **Time:** _____ *(taken after sample collection)*
**If NAPL Present:** **D.T.P.:** _____ **D.T.W.:** _____ **Thickness:** _____ **Time:** _____

**Project No.:** AES 070302
**Date:** 10-13-09
**Arrival Time:** 1052
**Air Temp:** 65°F
**T.O.C. Elev. (ft):** 7069.66
**Total Well Depth (ft):** 38.02

### Water Quality Parameters - Recorded During Well Purging

| Time | Temp (deg C) | Conductivity (µS) (mS) | DO (mg/L) | pH | ORP (mV) | PURGED VOLUME (see reverse for calc.) | Notes/Observations |
|---|---|---|---|---|---|---|---|
| 1103 | 12.37 | 2.299 | 1.71 | 7.11 | 60.5 | 0.25 | |
| 1108 | | | | | | | Samples Collected |
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### Analytical Parameters (include analysis method and number and type of sample containers)

BTEX per EPA Method 8021 (3 40mL Vials w/ HCl preserve)
TPH C6-C36 per EPA Method 8015B (2 40mL Vials w/ HCl preserve)
TPH C6-C36 per EPA Method 8015B (40mL Vial w/ no preservative)

**Disposal of Purged Water:** _____
**Collected Samples Stored on Ice in Cooler:** _____
**Chain of Custody Record Complete:** _____
**Analytical Laboratory:** Hall Environmental Analysis Laboratory, Albuquerque, NM
**Equipment Used During Sampling:** Keck Water Level or Keck Interface Level, YSI Water Quality Meter and New Disposable Bailer

**Notes/Comments:**

## MONITORING WELL SAMPLING RECORD

**Monitor Well No:** MW-4

Animas Environmental Services
624 E. Comanche, Farmington NM 87401
Tel. (505) 564-2281 Fax (505) 324-2022

**Site:** Highway 537 2006 and 2007 Spill
**Location:** Rio Arriba County, New Mexico
**Project:** Groundwater Monitoring and Sampling
**Sampling Technician:** N. Willis
**Purge / No Purge:** No Purge
**Well Diameter (in):** 2
**Initial D.T.W. (ft):** _____ **Time:** _____ *(taken at initial gauging of all wells)*
**Confirm D.T.W. (ft):** 27.59 **Time:** 1208 *(taken prior to purging well)*
**Final D.T.W. (ft):** _____ **Time:** _____ *(taken after sample collection)*
**If NAPL Present:** **D.T.P.:** _____ **D.T.W.:** _____ **Thickness:** _____ **Time:** _____

**Project No.:** AES 070302
**Date:** 10-13-09
**Arrival Time:** 1156
**Air Temp:** 65°F
**T.O.C. Elev. (ft):** 7068.11
**Total Well Depth (ft):** 35

### Water Quality Parameters - Recorded During Well Purging

| Time | Temp (deg C) | Conductivity (µS) (mS) | DO (mg/L) | pH | ORP (mV) | PURGED VOLUME (see reverse for calc.) | Notes/Observations |
|---|---|---|---|---|---|---|---|
| 1210 | 12.71 | 2.070 | 3.50 | 7.20 | 59.4 | 0.25 | |
| 1215 | | | | | | | Samples Collected |
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### Analytical Parameters (include analysis method and number and type of sample containers)

BTEX per EPA Method 8021 (3 40mL Vials w/ HCl preserve)
TPH C6-C36 per EPA Method 8015B (2 40mL Vials w/ HCl preserve)
TPH C6-C36 per EPA Method 8015B (40mL Vial w/ no preservative)

**Disposal of Purged Water:** _____
**Collected Samples Stored on Ice in Cooler:** _____
**Chain of Custody Record Complete:** _____
**Analytical Laboratory:** Hall Environmental Analysis Laboratory, Albuquerque, NM
**Equipment Used During Sampling:** Keck Water Level or Keck Interface Level, YSI Water Quality Meter and New Disposable Bailer

**Notes/Comments:**

## MONITORING WELL SAMPLING RECORD

**Monitor Well No:** MW-5

Animas Environmental Services
624 E. Comanche, Farmington NM 87401
Tel. (505) 564-2281 Fax (505) 324-2022

**Site:** Highway 537 2006 and 2007 Spill
**Location:** Rio Arriba County, New Mexico
**Project:** Groundwater Monitoring and Sampling
**Sampling Technician:** N. Willis
**Purge / No Purge:** No Purge
**Well Diameter (in):** 0.75
**Initial D.T.W. (ft):** _____ **Time:** _____ *(taken at initial gauging of all wells)*
**Confirm D.T.W. (ft):** 20.48 **Time:** 1228 *(taken prior to purging well)*
**Final D.T.W. (ft):** _____ **Time:** _____ *(taken after sample collection)*
**If NAPL Present:** **D.T.P.:** _____ **D.T.W.:** _____ **Thickness:** _____ **Time:** _____

**Project No.:** AES 070302
**Date:** 10-13-09
**Arrival Time:** 1222
**Air Temp:** 68°F
**T.O.C. Elev. (ft):** 7059.97
**Total Well Depth (ft):** 29.98

### Water Quality Parameters - Recorded During Well Purging

| Time | Temp (deg C) | Conductivity (µS) (mS) | DO (mg/L) | pH | ORP (mV) | PURGED VOLUME (see reverse for calc.) | Notes/Observations |
|---|---|---|---|---|---|---|---|
| 1230 | 12.65 | 10.92 | 1.14 | 7.58 | 60.2 | 0.125 | |
| 1235 | | | | | | | Samples Collected |
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### Analytical Parameters (include analysis method and number and type of sample containers)

BTEX per EPA Method 8021 (3 40mL Vials w/ HCl preserve)
TPH C6-C36 per EPA Method 8015B (2 40mL Vials w/ HCl preserve)
TPH C6-C36 per EPA Method 8015B (40mL Vial w/ no preservative)

**Disposal of Purged Water:** _____
**Collected Samples Stored on Ice in Cooler:** _____
**Chain of Custody Record Complete:** _____
**Analytical Laboratory:** Hall Environmental Analysis Laboratory, Albuquerque, NM
**Equipment Used During Sampling:** Keck Water Level or Keck Interface Level, YSI Water Quality Meter and New Disposable Bailer

**Notes/Comments:**

## MONITORING WELL SAMPLING RECORD

**Monitor Well No:** MW-6

Animas Environmental Services
624 E. Comanche, Farmington NM 87401
Tel. (505) 564-2281 Fax (505) 324-2022

**Site:** Highway 537 2006 and 2007 Spill
**Location:** Rio Arriba County, New Mexico
**Project:** Groundwater Monitoring and Sampling
**Sampling Technician:** N. Willis
**Purge / No Purge:** No Purge
**Well Diameter (in):** 0.75
**Initial D.T.W. (ft):** _____ **Time:** _____ *(taken at initial gauging of all wells)*
**Confirm D.T.W. (ft):** 27.89 **Time:** 1250 *(taken prior to purging well)*
**Final D.T.W. (ft):** _____ **Time:** _____ *(taken after sample collection)*
**If NAPL Present:** **D.T.P.:** _____ **D.T.W.:** _____ **Thickness:** _____ **Time:** _____

**Project No.:** AES 070302
**Date:** 10-13-09
**Arrival Time:** 1244
**Air Temp:** 68°F
**T.O.C. Elev. (ft):** 7061.97
**Total Well Depth (ft):** 33.39

### Water Quality Parameters - Recorded During Well Purging

| Time | Temp (deg C) | Conductivity (µS) (mS) | DO (mg/L) | pH | ORP (mV) | PURGED VOLUME (see reverse for calc.) | Notes/Observations |
|---|---|---|---|---|---|---|---|
| 1252 | 13.42 | 3.545 | 1.85 | 7.23 | 49.7 | 0.125 | |
| 1257 | | | | | | | Samples Collected |
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### Analytical Parameters (include analysis method and number and type of sample containers)

BTEX per EPA Method 8021 (3 40mL Vials w/ HCl preserve)
TPH C6-C36 per EPA Method 8015B (2 40mL Vials w/ HCl preserve)
TPH C6-C36 per EPA Method 8015B (40mL Vial w/ no preservative)

**Disposal of Purged Water:** _____
**Collected Samples Stored on Ice in Cooler:** _____
**Chain of Custody Record Complete:** _____
**Analytical Laboratory:** Hall Environmental Analysis Laboratory, Albuquerque, NM
**Equipment Used During Sampling:** Keck Water Level or Keck Interface Level, YSI Water Quality Meter and New Disposable Bailer

**Notes/Comments:**

## MONITORING WELL SAMPLING RECORD

**Monitor Well No:** MW-7

Animas Environmental Services
624 E. Comanche, Farmington NM 87401
Tel. (505) 564-2281 Fax (505) 324-2022

**Site:** Highway 537 2006 and 2007 Spill
**Location:** Rio Arriba County, New Mexico
**Project:** Groundwater Monitoring and Sampling
**Sampling Technician:** N. Willis
**Purge / No Purge:** No Purge
**Well Diameter (in):** 0.75
**Initial D.T.W. (ft):** _____ **Time:** _____ *(taken at initial gauging of all wells)*
**Confirm D.T.W. (ft):** 14.16 **Time:** 1317 *(taken prior to purging well)*
**Final D.T.W. (ft):** _____ **Time:** _____ *(taken after sample collection)*
**If NAPL Present:** **D.T.P.:** _____ **D.T.W.:** _____ **Thickness:** _____ **Time:** _____

**Project No.:** AES 070302
**Date:** 10-13-09
**Arrival Time:** 1310
**Air Temp:** 68°F
**T.O.C. Elev. (ft):** 7051.3
**Total Well Depth (ft):** 18.76

### Water Quality Parameters - Recorded During Well Purging

| Time | Temp (deg C) | Conductivity (µS) (mS) | DO (mg/L) | pH | ORP (mV) | PURGED VOLUME (see reverse for calc.) | Notes/Observations |
|---|---|---|---|---|---|---|---|
| 1318 | 15.41 | 1.837 | 1.66 | 6.88 | 60.2 | 0.125 | |
| 1323 | ~ | ~ | ~ | ~ | ~ | ~ | Samples Collected |
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### Analytical Parameters (include analysis method and number and type of sample containers)

BTEX per EPA Method 8021 (3 40mL Vials w/ HCl preserve)
TPH C6-C36 per EPA Method 8015B (2 40mL Vials w/ HCl preserve)
TPH C6-C36 per EPA Method 8015B (40mL Vial w/ no preservative)

**Disposal of Purged Water:** _____
**Collected Samples Stored on Ice in Cooler:** _____
**Chain of Custody Record Complete:** _____
**Analytical Laboratory:** Hall Environmental Analysis Laboratory, Albuquerque, NM
**Equipment Used During Sampling:** Keck Water Level or Keck Interface Level, YSI Water Quality Meter and New Disposable Bailer

**Notes/Comments:**

## MONITORING WELL SAMPLING RECORD

**Monitor Well No:** MW-10

Animas Environmental Services
624 E. Comanche, Farmington NM 87401
Tel. (505) 564-2281 Fax (505) 324-2022

**Site:** Highway 537 2006 and 2007 Spill
**Location:** Rio Arriba County, New Mexico
**Project:** Groundwater Monitoring and Sampling
**Sampling Technician:** N. Willis
**Purge / No Purge:** No Purge
**Well Diameter (in):** 0.75
**Initial D.T.W. (ft):** _____ **Time:** _____ *(taken at initial gauging of all wells)*
**Confirm D.T.W. (ft):** 9.57 **Time:** 1352 *(taken prior to purging well)*
**Final D.T.W. (ft):** _____ **Time:** _____ *(taken after sample collection)*
**If NAPL Present:** **D.T.P.:** _____ **D.T.W.:** _____ **Thickness:** _____ **Time:** _____

**Project No.:** AES 070302
**Date:** 10-13-09
**Arrival Time:** 1346
**Air Temp:** 71°F
**T.O.C. Elev. (ft):** 7038.05
**Total Well Depth (ft):** 18.2

### Water Quality Parameters - Recorded During Well Purging

| Time | Temp (deg C) | Conductivity (µS) (mS) | DO (mg/L) | pH | ORP (mV) | PURGED VOLUME (see reverse for calc.) | Notes/Observations |
|---|---|---|---|---|---|---|---|
| 1354 | 14.20 | 6.185 | 1.36 | 7.05 | 18.4 | 0.125 | |
| 1359 | | | | | | | Samples Collected |
| | | | | | | | |
| | | | | | | | |
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### Analytical Parameters (include analysis method and number and type of sample containers)

BTEX per EPA Method 8021 (3 40mL Vials w/ HCl preserve)
TPH C6-C36 per EPA Method 8015B (2 40mL Vials w/ HCl preserve)
TPH C6-C36 per EPA Method 8015B (40mL Vial w/ no preservative)

**Disposal of Purged Water:** _____
**Collected Samples Stored on Ice in Cooler:** _____
**Chain of Custody Record Complete:** _____
**Analytical Laboratory:** Hall Environmental Analysis Laboratory, Albuquerque, NM
**Equipment Used During Sampling:** Keck Water Level or Keck Interface Level, YSI Water Quality Meter and New Disposable Bailer

**Notes/Comments:**

# Chain-of-Custody Record

Client: Animas Environmental Services, LLC.

Mailing Address: 624 E. Comanche Farmington NM 87401

Phone #: 505-564-2281

email or Fax#: 505-324-2022

QA/QC Package:

☒ Standard ☐ Level 4 (Full Validation)

☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:

☒ Standard ☐ Rush _____

Project Name: HWY 537 '06-07 Spill

Project #: 070302

Project Manager: Ross Kennemer

Sampler: N. Willis

On Ice: ☐ Yes ☐ No

Sample Temperature: [illegible]


**HALL ENVIRONMENTAL ANALYSIS LABORATORY**

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107


**Analysis Request**

| Date | Time | Matrix | Sample Request ID | Container Type and # | Preservative Type | HEAL No. | BTEX + MTBE + TMB's (8021) | BTEX + MTBE + TPH (Gas only) | TPH Method 8015B (Gas/Diesel) | TPH (Method 418.1) | EDB (Method 504.1) | 8310 (PNA or PAH) | RCRA 8 Metals | Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$) | 8081 Pesticides / 8082 PCB's | 8260B (VOA) | 8270 (Semi-VOA) | 8021 (BTEX) | 8015B (TPH $C_6$-$C_{36}$) | | | Air Bubbles (Y or N) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $H_2O$ | Trip Blanks | 2-40mL Glass | HCl | | | | | | | | | | | | | X | | | | |
| 10-13-09 | 1016 | | MW-1 | 6-40mL Glass | 5-HCl 1-NON | | | | | | | | | | | | | X | X | | | |
| | 1049 | | MW-2 | | | | | | | | | | | | | | | X | X | | | |
| | 1108 | | MW-3 | | | | | | | | | | | | | | | X | X | | | |
| | 1215 | | MW-4 | | | | | | | | | | | | | | | X | X | | | |
| | 1235 | | MW-5 | | | | | | | | | | | | | | | X | X | | | |
| | 1257 | | MW-6 | | | | | | | | | | | | | | | X | X | | | |
| | 1323 | | MW-7 | | | | | | | | | | | | | | | X | X | | | |
| 10-13-09 | 1359 | $H_2O$ | MW-10 | 6-40mL Glass | 5-HCl 1-NON | | | | | | | | | | | | | X | X | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |

| Date: | Time: | Relinquished by: | Received by: | Date | Time |
|---|---|---|---|---|---|
| 10/13/09 | 1600 | Nathan Willis | Debnah Watson | 10/13/09 | 1600 |
| 10/14/09 | 1430 | Debnah Watson | | | |

Remarks: MW-5 & 10 samples were fizzy while collection

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

# COVER LETTER

Thursday, October 22, 2009

Ross Kennemer
Animas Environmental Services
624 East Comanche
Farmington, NM 87401

TEL: (505) 564-2281
FAX (505) 324-2022

RE: Highway 537 '06-07 Spill

Order No.: 0910272

Dear Ross Kennemer:

Hall Environmental Analysis Laboratory, Inc. received 9 sample(s) on 10/15/2009 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. Below is a list of our accreditations. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

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

Sincerely,

Andy Freeman, Laboratory Manager

NM Lab # NM9425
AZ license # AZ0682
ORELAP Lab # NM100001
Texas Lab# T104704424-08-TX

4901 Hawkins NE ■ Suite D ■ Albuquerque, NM 87109
505.345.3975 ■ Fax 505.345.4107
www.hallenvironmental.com

**Hall Environmental Analysis Laboratory, Inc.** Date: *22-Oct-09*

**CLIENT:** Animas Environmental Services
**Project:** Highway 537 '06-07 Spill
**Lab Order:** 0910272

## CASE NARRATIVE

Analytical Comments for METHOD 8021BTEX_W, SAMPLE 0910272-09A: pH=5.5 Analytical Comments for METHOD 8015GRO_W, SAMPLE 0910272-09A: pH=5.5

# Hall Environmental Analysis Laboratory, Inc.

**Date:** *22-Oct-09*

| | | | |
|---|---|---|---|
| **CLIENT:** | Animas Environmental Services | **Client Sample ID:** | TRIP BLANK |
| **Lab Order:** | 0910272 | **Collection Date:** | |
| **Project:** | Highway 537 '06-07 Spill | **Date Received:** | 10/15/2009 |
| **Lab ID:** | 0910272-01 | **Matrix:** | TRIP BLANK |

| Analyses | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** |
| Benzene | ND | 1.0 | | µg/L | 1 | 10/20/2009 4:07:35 PM |
| Toluene | ND | 1.0 | | µg/L | 1 | 10/20/2009 4:07:35 PM |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 10/20/2009 4:07:35 PM |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 10/20/2009 4:07:35 PM |
| Surr: 4-Bromofluorobenzene | 76.5 | 65.9-130 | | %REC | 1 | 10/20/2009 4:07:35 PM |

| Qualifiers: | | | | | |
|---|---|---|---|---|---|
| | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | E | Estimated value | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limits | MCL | Maximum Contaminant Level |
| | ND | Not Detected at the Reporting Limit | RL | Reporting Limit |
| | S | Spike recovery outside accepted recovery limits | | |

# Hall Environmental Analysis Laboratory, Inc.

**Date:** *22-Oct-09*

| | | | |
|---|---|---|---|
| **CLIENT:** | Animas Environmental Services | **Client Sample ID:** | MW-1 |
| **Lab Order:** | 0910272 | **Collection Date:** | 10/13/2009 10:16:00 AM |
| **Project:** | Highway 537 '06-07 Spill | **Date Received:** | 10/15/2009 |
| **Lab ID:** | 0910272-02 | **Matrix:** | AQUEOUS |

| Analyses | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **EPA METHOD 8015B: DIESEL RANGE** | | | | | | Analyst: **SCC** |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 10/19/2009 7:27:40 AM |
| Motor Oil Range Organics (MRO) | ND | 5.0 | | mg/L | 1 | 10/19/2009 7:27:40 AM |
| Surr: DNOP | 115 | 58-140 | | %REC | 1 | 10/19/2009 7:27:40 AM |
| **EPA METHOD 8015B: GASOLINE RANGE** | | | | | | Analyst: **NSB** |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 10/17/2009 1:51:42 AM |
| Surr: BFB | 93.4 | 55.2-107 | | %REC | 1 | 10/17/2009 1:51:42 AM |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** |
| Benzene | ND | 1.0 | | µg/L | 1 | 10/17/2009 1:51:42 AM |
| Toluene | ND | 1.0 | | µg/L | 1 | 10/17/2009 1:51:42 AM |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 10/17/2009 1:51:42 AM |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 10/17/2009 1:51:42 AM |
| Surr: 4-Bromofluorobenzene | 94.3 | 65.9-130 | | %REC | 1 | 10/17/2009 1:51:42 AM |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Estimated value | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | MCL | Maximum Contaminant Level |
| ND | Not Detected at the Reporting Limit | RL | Reporting Limit |
| S | Spike recovery outside accepted recovery limits | | |

# Hall Environmental Analysis Laboratory, Inc.

**Date:** *22-Oct-09*

| | | | |
|---|---|---|---|
| **CLIENT:** | Animas Environmental Services | **Client Sample ID:** | MW-2 |
| **Lab Order:** | 0910272 | **Collection Date:** | 10/13/2009 10:49:00 AM |
| **Project:** | Highway 537 '06-07 Spill | **Date Received:** | 10/15/2009 |
| **Lab ID:** | 0910272-03 | **Matrix:** | AQUEOUS |

| Analyses | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **EPA METHOD 8015B: DIESEL RANGE** | | | | | | Analyst: **SCC** |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 10/19/2009 8:03:08 AM |
| Motor Oil Range Organics (MRO) | ND | 5.0 | | mg/L | 1 | 10/19/2009 8:03:08 AM |
| Surr: DNOP | 114 | 58-140 | | %REC | 1 | 10/19/2009 8:03:08 AM |
| **EPA METHOD 8015B: GASOLINE RANGE** | | | | | | Analyst: **NSB** |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 10/17/2009 2:22:09 AM |
| Surr: BFB | 91.6 | 55.2-107 | | %REC | 1 | 10/17/2009 2:22:09 AM |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** |
| Benzene | ND | 1.0 | | µg/L | 1 | 10/17/2009 2:22:09 AM |
| Toluene | ND | 1.0 | | µg/L | 1 | 10/17/2009 2:22:09 AM |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 10/17/2009 2:22:09 AM |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 10/17/2009 2:22:09 AM |
| Surr: 4-Bromofluorobenzene | 92.8 | 65.9-130 | | %REC | 1 | 10/17/2009 2:22:09 AM |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Estimated value | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | MCL | Maximum Contaminant Level |
| ND | Not Detected at the Reporting Limit | RL | Reporting Limit |
| S | Spike recovery outside accepted recovery limits | | |

# Hall Environmental Analysis Laboratory, Inc.

**Date:** *22-Oct-09*

| | | | |
|---|---|---|---|
| **CLIENT:** | Animas Environmental Services | **Client Sample ID:** | MW-3 |
| **Lab Order:** | 0910272 | **Collection Date:** | 10/13/2009 11:08:00 AM |
| **Project:** | Highway 537 '06-07 Spill | **Date Received:** | 10/15/2009 |
| **Lab ID:** | 0910272-04 | **Matrix:** | AQUEOUS |

| Analyses | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **EPA METHOD 8015B: DIESEL RANGE** | | | | | | Analyst: **SCC** |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 10/19/2009 9:14:27 AM |
| Motor Oil Range Organics (MRO) | ND | 5.0 | | mg/L | 1 | 10/19/2009 9:14:27 AM |
| Surr: DNOP | 111 | 58-140 | | %REC | 1 | 10/19/2009 9:14:27 AM |
| **EPA METHOD 8015B: GASOLINE RANGE** | | | | | | Analyst: **NSB** |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 10/17/2009 2:52:35 AM |
| Surr: BFB | 90.4 | 55.2-107 | | %REC | 1 | 10/17/2009 2:52:35 AM |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** |
| Benzene | ND | 1.0 | | µg/L | 1 | 10/17/2009 2:52:35 AM |
| Toluene | ND | 1.0 | | µg/L | 1 | 10/17/2009 2:52:35 AM |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 10/17/2009 2:52:35 AM |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 10/17/2009 2:52:35 AM |
| Surr: 4-Bromofluorobenzene | 89.7 | 65.9-130 | | %REC | 1 | 10/17/2009 2:52:35 AM |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Estimated value | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | MCL | Maximum Contaminant Level |
| ND | Not Detected at the Reporting Limit | RL | Reporting Limit |
| S | Spike recovery outside accepted recovery limits | | |

## Hall Environmental Analysis Laboratory, Inc.

**Date:** *22-Oct-09*

| | | | |
|---|---|---|---|
| **CLIENT:** | Animas Environmental Services | **Client Sample ID:** | MW-4 |
| **Lab Order:** | 0910272 | **Collection Date:** | 10/13/2009 12:15:00 PM |
| **Project:** | Highway 537 '06-07 Spill | **Date Received:** | 10/15/2009 |
| **Lab ID:** | 0910272-05 | **Matrix:** | AQUEOUS |

| Analyses | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **EPA METHOD 8015B: DIESEL RANGE** | | | | | | Analyst: **SCC** |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 10/19/2009 9:50:24 AM |
| Motor Oil Range Organics (MRO) | ND | 5.0 | | mg/L | 1 | 10/19/2009 9:50:24 AM |
| Surr: DNOP | 112 | 58-140 | | %REC | 1 | 10/19/2009 9:50:24 AM |
| **EPA METHOD 8015B: GASOLINE RANGE** | | | | | | Analyst: **NSB** |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 10/17/2009 3:22:54 AM |
| Surr: BFB | 79.7 | 55.2-107 | | %REC | 1 | 10/17/2009 3:22:54 AM |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** |
| Benzene | ND | 1.0 | | µg/L | 1 | 10/17/2009 3:22:54 AM |
| Toluene | ND | 1.0 | | µg/L | 1 | 10/17/2009 3:22:54 AM |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 10/17/2009 3:22:54 AM |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 10/17/2009 3:22:54 AM |
| Surr: 4-Bromofluorobenzene | 76.6 | 65.9-130 | | %REC | 1 | 10/17/2009 3:22:54 AM |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Estimated value | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | MCL | Maximum Contaminant Level |
| ND | Not Detected at the Reporting Limit | RL | Reporting Limit |
| S | Spike recovery outside accepted recovery limits | | |

# Hall Environmental Analysis Laboratory, Inc.

**Date:** *22-Oct-09*

| | | | |
|---|---|---|---|
| **CLIENT:** | Animas Environmental Services | **Client Sample ID:** | MW-5 |
| **Lab Order:** | 0910272 | **Collection Date:** | 10/13/2009 12:35:00 PM |
| **Project:** | Highway 537 '06-07 Spill | **Date Received:** | 10/15/2009 |
| **Lab ID:** | 0910272-06 | **Matrix:** | AQUEOUS |

| Analyses | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **EPA METHOD 8015B: DIESEL RANGE** | | | | | | Analyst: **SCC** |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 10/19/2009 10:26:37 AM |
| Motor Oil Range Organics (MRO) | ND | 5.0 | | mg/L | 1 | 10/19/2009 10:26:37 AM |
| Surr: DNOP | 103 | 58-140 | | %REC | 1 | 10/19/2009 10:26:37 AM |
| **EPA METHOD 8015B: GASOLINE RANGE** | | | | | | Analyst: **NSB** |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 10/17/2009 3:53:12 AM |
| Surr: BFB | 94.1 | 55.2-107 | | %REC | 1 | 10/17/2009 3:53:12 AM |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** |
| Benzene | ND | 1.0 | | µg/L | 1 | 10/17/2009 3:53:12 AM |
| Toluene | ND | 1.0 | | µg/L | 1 | 10/17/2009 3:53:12 AM |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 10/17/2009 3:53:12 AM |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 10/17/2009 3:53:12 AM |
| Surr: 4-Bromofluorobenzene | 94.0 | 65.9-130 | | %REC | 1 | 10/17/2009 3:53:12 AM |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Estimated value | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | MCL | Maximum Contaminant Level |
| ND | Not Detected at the Reporting Limit | RL | Reporting Limit |
| S | Spike recovery outside accepted recovery limits | | |

# Hall Environmental Analysis Laboratory, Inc.

**Date:** *22-Oct-09*

| | | | |
|---|---|---|---|
| **CLIENT:** | Animas Environmental Services | **Client Sample ID:** | MW-6 |
| **Lab Order:** | 0910272 | **Collection Date:** | 10/13/2009 12:57:00 PM |
| **Project:** | Highway 537 '06-07 Spill | **Date Received:** | 10/15/2009 |
| **Lab ID:** | 0910272-07 | **Matrix:** | AQUEOUS |

| Analyses | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **EPA METHOD 8015B: DIESEL RANGE** | | | | | | **Analyst: SCC** |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 10/19/2009 11:02:02 AM |
| Motor Oil Range Organics (MRO) | ND | 5.0 | | mg/L | 1 | 10/19/2009 11:02:02 AM |
| Surr: DNOP | 112 | 58-140 | | %REC | 1 | 10/19/2009 11:02:02 AM |
| **EPA METHOD 8015B: GASOLINE RANGE** | | | | | | **Analyst: NSB** |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 10/17/2009 4:23:38 AM |
| Surr: BFB | 80.8 | 55.2-107 | | %REC | 1 | 10/17/2009 4:23:38 AM |
| **EPA METHOD 8021B: VOLATILES** | | | | | | **Analyst: NSB** |
| Benzene | ND | 1.0 | | µg/L | 1 | 10/17/2009 4:23:38 AM |
| Toluene | ND | 1.0 | | µg/L | 1 | 10/17/2009 4:23:38 AM |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 10/17/2009 4:23:38 AM |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 10/17/2009 4:23:38 AM |
| Surr: 4-Bromofluorobenzene | 78.0 | 65.9-130 | | %REC | 1 | 10/17/2009 4:23:38 AM |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Estimated value | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | MCL | Maximum Contaminant Level |
| ND | Not Detected at the Reporting Limit | RL | Reporting Limit |
| S | Spike recovery outside accepted recovery limits | | |

## Hall Environmental Analysis Laboratory, Inc.

**Date:** *22-Oct-09*

| | | | |
|---|---|---|---|
| **CLIENT:** | Animas Environmental Services | **Client Sample ID:** | MW-7 |
| **Lab Order:** | 0910272 | **Collection Date:** | 10/13/2009 1:23:00 PM |
| **Project:** | Highway 537 '06-07 Spill | **Date Received:** | 10/15/2009 |
| **Lab ID:** | 0910272-08 | **Matrix:** | AQUEOUS |

| Analyses | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **EPA METHOD 8015B: DIESEL RANGE** | | | | | | Analyst: **SCC** |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 10/19/2009 11:37:08 AM |
| Motor Oil Range Organics (MRO) | ND | 5.0 | | mg/L | 1 | 10/19/2009 11:37:08 AM |
| Surr: DNOP | 110 | 58-140 | | %REC | 1 | 10/19/2009 11:37:08 AM |
| **EPA METHOD 8015B: GASOLINE RANGE** | | | | | | Analyst: **NSB** |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 10/17/2009 4:53:53 AM |
| Surr: BFB | 85.6 | 55.2-107 | | %REC | 1 | 10/17/2009 4:53:53 AM |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** |
| Benzene | ND | 1.0 | | µg/L | 1 | 10/17/2009 4:53:53 AM |
| Toluene | ND | 1.0 | | µg/L | 1 | 10/17/2009 4:53:53 AM |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 10/17/2009 4:53:53 AM |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 10/17/2009 4:53:53 AM |
| Surr: 4-Bromofluorobenzene | 84.1 | 65.9-130 | | %REC | 1 | 10/17/2009 4:53:53 AM |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Estimated value | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | MCL | Maximum Contaminant Level |
| ND | Not Detected at the Reporting Limit | RL | Reporting Limit |
| S | Spike recovery outside accepted recovery limits | | |

# Hall Environmental Analysis Laboratory, Inc.

**Date:** *22-Oct-09*

| | | | |
|---|---|---|---|
| **CLIENT:** | Animas Environmental Services | **Client Sample ID:** | MW-10 |
| **Lab Order:** | 0910272 | **Collection Date:** | 10/13/2009 1:59:00 PM |
| **Project:** | Highway 537 '06-07 Spill | **Date Received:** | 10/15/2009 |
| **Lab ID:** | 0910272-09 | **Matrix:** | AQUEOUS |

| Analyses | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **EPA METHOD 8015B: DIESEL RANGE** | | | | | | Analyst: **SCC** |
| Diesel Range Organics (DRO) | ND | 1.0 | | mg/L | 1 | 10/19/2009 12:12:18 PM |
| Motor Oil Range Organics (MRO) | ND | 5.0 | | mg/L | 1 | 10/19/2009 12:12:18 PM |
| Surr: DNOP | 111 | 58-140 | | %REC | 1 | 10/19/2009 12:12:18 PM |
| **EPA METHOD 8015B: GASOLINE RANGE** | | | | | | Analyst: **NSB** |
| Gasoline Range Organics (GRO) | ND | 0.050 | | mg/L | 1 | 10/17/2009 5:24:10 AM |
| Surr: BFB | 92.9 | 55.2-107 | | %REC | 1 | 10/17/2009 5:24:10 AM |
| **EPA METHOD 8021B: VOLATILES** | | | | | | Analyst: **NSB** |
| Benzene | ND | 1.0 | | µg/L | 1 | 10/17/2009 5:24:10 AM |
| Toluene | ND | 1.0 | | µg/L | 1 | 10/17/2009 5:24:10 AM |
| Ethylbenzene | ND | 1.0 | | µg/L | 1 | 10/17/2009 5:24:10 AM |
| Xylenes, Total | ND | 2.0 | | µg/L | 1 | 10/17/2009 5:24:10 AM |
| Surr: 4-Bromofluorobenzene | 92.7 | 65.9-130 | | %REC | 1 | 10/17/2009 5:24:10 AM |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Estimated value | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | MCL | Maximum Contaminant Level |
| ND | Not Detected at the Reporting Limit | RL | Reporting Limit |
| S | Spike recovery outside accepted recovery limits | | |

# QA/QC SUMMARY REPORT

**Client:** Animas Environmental Services
**Project:** Highway 537 '06-07 Spill **Work Order:** 0910272

| Analyte | Result | Units | PQL | SPK Va | SPK ref | %Rec | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Method: EPA Method 8015B: Diesel Range** | | | | | | | | | | | |
| **Sample ID: MB-20345** | | *MBLK* | | | | Batch ID: | **20345** | Analysis Date: | 10/19/2009 4:30:32 AM | | |
| Diesel Range Organics (DRO) | ND | mg/L | 1.0 | | | | | | | | |
| Motor Oil Range Organics (MRO) | ND | mg/L | 5.0 | | | | | | | | |
| **Sample ID: LCS-20345** | | *LCS* | | | | Batch ID: | **20345** | Analysis Date: | 10/19/2009 5:05:54 AM | | |
| Diesel Range Organics (DRO) | 6.111 | mg/L | 1.0 | 5 | 0 | 122 | 74 | 157 | | | |
| **Method: EPA Method 8015B: Gasoline Range** | | | | | | | | | | | |
| **Sample ID: 5ML RB** | | *MBLK* | | | | Batch ID: | **R35776** | Analysis Date: | 10/16/2009 11:37:36 AM | | |
| Gasoline Range Organics (GRO) | ND | mg/L | 0.050 | | | | | | | | |
| **Sample ID: 5ML RB** | | *MBLK* | | | | Batch ID: | **R35813** | Analysis Date: | 10/20/2009 9:36:08 AM | | |
| Gasoline Range Organics (GRO) | ND | mg/L | 0.050 | | | | | | | | |
| **Sample ID: 2.5UG GRO LCS** | | *LCS* | | | | Batch ID: | **R35776** | Analysis Date: | 10/16/2009 9:47:56 PM | | |
| Gasoline Range Organics (GRO) | 0.5056 | mg/L | 0.050 | 0.5 | 0 | 101 | 80 | 115 | | | |
| **Sample ID: 2.5UG GRO LCS** | | *LCS* | | | | Batch ID: | **R35813** | Analysis Date: | 10/20/2009 6:38:57 PM | | |
| Gasoline Range Organics (GRO) | 0.4980 | mg/L | 0.050 | 0.5 | 0 | 99.6 | 80 | 115 | | | |
| **Method: EPA Method 8021B: Volatiles** | | | | | | | | | | | |
| **Sample ID: 5ML RB** | | *MBLK* | | | | Batch ID: | **R35776** | Analysis Date: | 10/16/2009 11:37:36 AM | | |
| Benzene | ND | µg/L | 1.0 | | | | | | | | |
| Toluene | ND | µg/L | 1.0 | | | | | | | | |
| Ethylbenzene | ND | µg/L | 1.0 | | | | | | | | |
| Xylenes, Total | ND | µg/L | 2.0 | | | | | | | | |
| **Sample ID: 5ML RB** | | *MBLK* | | | | Batch ID: | **R35813** | Analysis Date: | 10/20/2009 9:36:08 AM | | |
| Benzene | ND | µg/L | 1.0 | | | | | | | | |
| Toluene | ND | µg/L | 1.0 | | | | | | | | |
| Ethylbenzene | ND | µg/L | 1.0 | | | | | | | | |
| Xylenes, Total | ND | µg/L | 2.0 | | | | | | | | |
| **Sample ID: 100NG BTEX LCS R** | | *LCS* | | | | Batch ID: | **R35776** | Analysis Date: | 10/16/2009 5:11:35 PM | | |
| Benzene | 19.81 | µg/L | 1.0 | 20 | 0 | 99.1 | 85.9 | 113 | | | |
| Toluene | 21.13 | µg/L | 1.0 | 20 | 0 | 106 | 86.4 | 113 | | | |
| Ethylbenzene | 21.53 | µg/L | 1.0 | 20 | 0.116 | 107 | 83.5 | 118 | | | |
| Xylenes, Total | 63.71 | µg/L | 2.0 | 60 | 0 | 106 | 83.4 | 122 | | | |
| **Sample ID: 100NG BTEX LCS** | | *LCS* | | | | Batch ID: | **R35776** | Analysis Date: | 10/16/2009 10:18:23 PM | | |
| Benzene | 19.42 | µg/L | 1.0 | 20 | 0 | 97.1 | 85.9 | 113 | | | |
| Toluene | 20.61 | µg/L | 1.0 | 20 | 0 | 103 | 86.4 | 113 | | | |
| Ethylbenzene | 20.41 | µg/L | 1.0 | 20 | 0.116 | 101 | 83.5 | 118 | | | |
| Xylenes, Total | 61.22 | µg/L | 2.0 | 60 | 0 | 102 | 83.4 | 122 | | | |
| **Sample ID: 100NG BTEX LCS** | | *LCS* | | | | Batch ID: | **R35813** | Analysis Date: | 10/20/2009 8:40:17 PM | | |
| Benzene | 18.36 | µg/L | 1.0 | 20 | 0 | 91.8 | 85.9 | 113 | | | |
| Toluene | 18.71 | µg/L | 1.0 | 20 | 0 | 93.5 | 86.4 | 113 | | | |
| Ethylbenzene | 18.41 | µg/L | 1.0 | 20 | 0 | 92.0 | 83.5 | 118 | | | |
| Xylenes, Total | 54.56 | µg/L | 2.0 | 60 | 0 | 90.9 | 83.4 | 122 | | | |

**Qualifiers:**

| | | | |
|---|---|---|---|
| E | Estimated value | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | S | Spike recovery outside accepted recovery limits |

## Hall Environmental Analysis Laboratory, Inc.

### Sample Receipt Checklist

Client Name **ANIMAS ENVIRONMENTAL** Date Received: **10/15/2009**

Work Order Number **0910272** Received by: **TLS**

Checklist completed by: _____ 10/15/09 Sample ID labels checked by: _____

Signature Date Initials

Matrix: Carrier name: Greyhound

| | | | | |
|---|---|---|---|---|
| Shipping container/cooler in good condition? | Yes ☑ | No ☐ | Not Present ☐ | |
| Custody seals intact on shipping container/cooler? | Yes ☑ | No ☐ | Not Present ☐ | Not Shipped ☐ |
| Custody seals intact on sample bottles? | Yes ☐ | No ☐ | N/A ☑ | |
| Chain of custody present? | Yes ☑ | No ☐ | | |
| Chain of custody signed when relinquished and received? | Yes ☑ | No ☐ | | |
| Chain of custody agrees with sample labels? | Yes ☑ | No ☐ | | |
| Samples in proper container/bottle? | Yes ☑ | No ☐ | | |
| Sample containers intact? | Yes ☑ | No ☐ | | |
| Sufficient sample volume for indicated test? | Yes ☑ | No ☐ | | |
| All samples received within holding time? | Yes ☑ | No ☐ | | Number of preserved bottles checked for pH: |
| Water - VOA vials have zero headspace? | No VOA vials submitted ☐ | Yes ☑ | No ☐ | |
| Water - Preservation labels on bottle and cap match? | Yes ☐ | No ☐ | N/A ☑ | |
| Water - pH acceptable upon receipt? | Yes ☐ | No ☐ | N/A ☑ | _____ *<2 >12 unless noted below.* |
| Container/Temp Blank temperature? | **0.8°** | *<6° C Acceptable* If given sufficient time to cool. | | |

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

# Chain-of-Custody Record

Client: Animas Environmental Services, LLC.

Mailing Address: 624 E. Comanche Farmington NM 87401

Phone #: 505-564-2281

email or Fax#: 505-324-2022

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
☐ Other
☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: HWY 537 '06-07 Spill

Project #: 070302

Project Manager: Ross Kennemer

Sampler: N. Willis

On Ice: ☒ Yes ☐ No

Sample Temperature: 0.8


**HALL ENVIRONMENTAL ANALYSIS LABORATORY**

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107


| Date | Time | Matrix | Sample Request ID | Container Type and # | Preservative Type | HEAL No. 0910023 | BTEX + MTBE + TMB's (8021) | BTEX + MTBE + TPH (Gas only) | TPH Method 8015B (Gas/Diesel) | TPH (Method 418.1) | EDB (Method 504.1) | 8310 (PNA or PAH) | RCRA 8 Metals | Anions ($F,Cl,NO_3,NO_2,PO_4,SO_4$) | 8081 Pesticides / 8082 PCB's | 8260B (VOA) | 8270 (Semi-VOA) | 8021 (BTEX) | 8015B (TPH C6-C36) | | | Air Bubbles (Y or N) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $H_2O$ | Trip Blanks | 2-40mL Glass | HCl | 1 | | | | | | | | | | | | X | | | | |
| 10-13-09 | 1016 | | MW-1 | 6-40mL Glass | 5-HCl 1-NON | 2 | | | | | | | | | | | | X | X | | | |
| | 1049 | | MW-2 | | | 3 | | | | | | | | | | | | X | X | | | |
| | 1108 | | MW-3 | | | 4 | | | | | | | | | | | | X | X | | | |
| | 1215 | | MW-4 | | | 5 | | | | | | | | | | | | X | X | | | |
| | 1235 | | MW-5 | | | 6 | | | | | | | | | | | | X | X | | | |
| | 1257 | | MW-6 | | | 7 | | | | | | | | | | | | X | X | | | |
| | 1323 | | MW-7 | | | 8 | | | | | | | | | | | | X | X | | | |
| 10-13-09 | 1359 | $H_2O$ | MW-10 | 6-40mL Glass | 5-HCl 1-NON | 9 | | | | | | | | | | | | X | X | | | |

| Date: | Time: | Relinquished by: | Received by: | Date | Time |
|---|---|---|---|---|---|
| 10/13/09 | 1600 | Nate Willis | Deborah Watson | 10/13/09 | 1600 |
| 10/14/09 | 1430 | Deborah Watson | | 10/15/09 | 940 |

Remarks: MW-5 & 10 samples were fizzy while collection