



OIL CONS. DIV DIST. 3

FEB 24 2016

# 2015 Annual Report

**Bisti Landfarm**

**Western Refining Centralized Surface Waste  
Management Facility NM-02-0010**

**San Juan County, New Mexico**

District Copy  
For Scanning Only  
Has NOT been processed.

**February 2016**

120

February 19<sup>th</sup>, 2016

Mr. Brad Jones  
New Mexico Energy, Minerals, & Natural Resources Department  
Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Fed Ex Tracking #: 7756 9086 0786 (NMOCD - Santa Fe Office)  
Certified Mail #: 7015 1520 0001 8113 6076 (NMOCD - Aztec Office)

**Re: 2015 Annual Sampling Report  
Western Refining Centralized Surface Waste Management Facility  
Permit #: NM-02-0010  
San Juan County, New Mexico**

Dear Mr. Jones,

Please find enclosed the 2015 Annual Sampling Report for the Western Refining Centralized Surface Waste Management Facility located in San Juan County, New Mexico. This report summarizes the sampling activities performed in 2015.

If you have any questions or require additional information, please do not hesitate to contact me directly at (505) 632-4166.

Sincerely,



Kelly Robinson  
Environmental Manager - Logistics  
Western Refining Southwest, Inc.

cc: J. Kelly – OCD/EMNRD  
R. Schmaltz – WNL  
K. Robinson – WNL  
A. Hains - WNR

**2015 ANNUAL REPORT**

**BISTI LANDFARM  
WESTERN REFINING CENTRALIZED SURFACE WASTE  
MANAGEMENT FACILITY NM-02-0010**

**SAN JUAN COUNTY, NEW MEXICO**

**FEBRUARY 2016**

**Prepared for:**

**WESTERN REFINING SOUTHWEST, INC.  
111 County Road 4990  
Bloomfield, New Mexico 87413**

**Prepared by:**

**LT ENVIRONMENTAL, INC.  
2243 Main Avenue, Suite 3  
Durango, Colorado 81301  
(970) 385-1096**



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## EXECUTIVE SUMMARY

LT Environmental, Inc. (LTE), on behalf of Western Refining Southwest, Inc. (Western), has prepared this report detailing compliance-related soil monitoring activities completed between January 2015 through December 2015 at the Bisti Landfarm (Site), permit number NM-02-0010, in San Juan County, New Mexico.

The Site is located in the northwest quarter of the southeast quarter of Section 16, Township 25 North, Range 12 West in San Juan County, New Mexico. The Site was permitted in February 1998 under New Mexico Oil Conservation Division (NMOCD) Rule 711 to Giant Industries, Arizona (Giant). Giant disposed of petroleum hydrocarbon-impacted soil at the Site resulting in three cells: API Cell, Crude Cell (containing material originating from Pettigrew, East Line, Bisti, and West Line), and Cell 1. Cell 1 is inactive and no longer monitored or maintained. Western acquired the Site from Giant in June 2007.

The scope of work for this project consisted of soil sampling including semiannual treatment zone sampling and vadose zone sampling as required by New Mexico Administrative Code 19.15.36.15 (Rule 36). The scope of work for this project also included the annual and quarterly vadose zone sampling as required by the original 711 permit. Soil sampling was conducted to monitor the natural attenuation of contaminants of concern in the treatment zone and to monitor potential migration of contaminants of concern into the vadose zone.

Soil sampling results are presented in the report and vadose zone soil analytical results are compared to the laboratory practical quantitation limit and background sample results. Concentrations of total petroleum hydrocarbons and chloride in the treatment zone are within the range of impacted soil undergoing treatment at the Site and do not exceed Treatment Zone Closure Performance Standards identified in Rule 36. Laboratory analytical results for vadose zone sampling were consistent with historical monitoring results. Since treatment zone monitoring results do not exceed Treatment Zone Closure Performance Standards identified in Rule 36, Western will pursue closure of the landfarm in 2016.



## 1.0 INTRODUCTION

LT Environmental, Inc. (LTE), on behalf of Western Refining Southwest, Inc. (Western), has prepared this report detailing compliance soil sampling completed from January 2015 through December 2015 to monitor soil remediation at the Bisti Landfarm (Site), permit number NM-02-0010 in San Juan County, New Mexico.

### 1.1 SITE DESCRIPTION AND HISTORY

The Site occupies approximately 28 acres in the northwest quarter of the southeast quarter of Section 16, Township 25 North, Range 12 West in San Juan County, New Mexico (Figure 1). In 1998, Giant Industries, Arizona (Giant) permitted the Site as a surface waste management facility under the New Mexico Oil Conservation Division (NMOCD) Rule 711. Giant disposed of petroleum hydrocarbon-impacted soil at the Site resulting in three cells: API Cell, Crude Cell (containing material originating from Pettigrew, East Line, Bisti, and West Line) and Cell 1, which is currently inactive (Figure 2). In 2007, the NMOCD passed new rules (19.15.36 of the New Mexico Administrative Code [NMAC] [Rule 36]) pertaining to surface waste management facilities and required compliance with the transitional provisions of Rule 36. Western acquired the Site from Giant in June 2007 and disposed of petroleum hydrocarbon-impacted soil at the Site until 2010. Western continues to monitor and maintain the API Cell and the Crude Cell using the provisional requirements of Rule 711 and Rule 36 as a guide. Cell 1 is no longer tilled based on a letter dated March 8, 2004, from the NMOCD to Giant stating Cell 1 was approved for discontinued maintenance.

### 1.2 SCOPE OF WORK

The scope of work for this project consisted of soil sampling including semiannual treatment zone sampling and vadose zone sampling as required by Rule 36. Quarterly and annual vadose zone sampling as required by the original Rule 711 permit was also conducted. Soil sampling was conducted to monitor the natural attenuation of contaminants of concern in the treatment zone and to monitor potential migration of contaminants of concern into the vadose zone. A summary of field activities, laboratory analytical soil sampling results, and conclusions are presented in the subsequent sections of this report.

## 2.0 METHODOLOGY

### 2.1 SEMIANNUAL TREATMENT ZONE MONITORING

Treatment zones in the API and Crude cells were composite sampled semiannually on March 19, 2015 and September 1, 2015, by placing discrete samples collected from approximately 6 inches below the landfarm surface into a 1-gallon plastic bag. The soil within the bag was thoroughly homogenized before filling sterile glass sampling containers provided by the laboratory. The Crude Cell treatment zone samples included four discrete samples: one each from the Pettigrew, Bisti, West Line and East Line source areas. The API Cell treatment zone samples included four discrete samples from the API Cell. Figure 3 depicts treatment zone soil sample locations. Treatment zone samples were analyzed for total petroleum hydrocarbons (TPH) by United States Environmental Protection Agency (USEPA) Method 418.1, gasoline range organics (GRO), diesel range organics (DRO) and motor oil range organics (MRO) by USEPA Method 8015M/D, and chloride by USEPA Method 300.0.

### 2.2 QUARTERLY VADOSE ZONE MONITORING

Discrete vadose zone samples were collected quarterly on March 19, 2015, June 26, 2015, September 1, 2015, and December 16, 2015, from the two active cells (API and Crude cells). Samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by USEPA Method 8021B, TPH by USEPA Method 418.1, GRO, DRO and MRO by USEPA Method 8015M/D, and chloride by USEPA Method 300.0. The number of vadose zone samples collected within each cell was dependent on the size of the cell. For each sampling event, four soil samples were collected from the Crude Cell: one beneath the East Line source area, one beneath the West Line source area, one beneath the Pettigrew source area, and one beneath the Bisti source area. One sample was collected from beneath the API Cell. Figure 4 depicts quarterly vadose zone soil sample locations. All vadose zone soil samples were collected from 3 feet to 4 feet below the original ground surface and boreholes were filled with hydrated bentonite from total depth to existing ground surface upon completion.

### 2.3 ANNUAL VADOSE ZONE MONITORING

To address annual sampling requirements in the original Rule 711 permit, vadose zone soil samples (East Line, West Line, Bisti, Pettigrew and API) collected on March 19, 2015, were additionally analyzed for sulfate by USEPA Method 300.0, metals (arsenic, barium, cadmium, calcium, chromium, lead, magnesium, potassium, selenium, silver, and sodium) by USEPA Method 6010B, mercury by USEPA Method 7471, and alkalinity by ASA10-3.

All samples collected were placed on ice and sealed in a cooler for delivery to Hall Environmental Analysis Laboratory, Inc. in Albuquerque, New Mexico, for analysis. Soil samples were labeled with the date and time of collection, sample name, sample collector's name, and parameters to be analyzed. Strict chain-of-custody procedures were documented including the date and time sampled, sample number, type of sample, sample collector's name and signature, preservative used, and analyses required.



### 3.0 ANALYTICAL RESULTS

#### 3.1 SEMIANNUAL TREATMENT ZONE ANALYTICAL RESULTS

Table 1 presents the analytical results from the treatment zone monitoring events conducted in March and September 2015, which are compared to the Treatment Zone Closure Performance Standards defined in Rule 36. Concentrations of TPH and chloride did not exceed Treatment Zone Closure Performance Standards. The complete laboratory analytical reports are presented in Appendix A.

#### 3.2 QUARTERLY VADOSE ZONE ANALYTICAL RESULTS

The laboratory analytical results for BTEX, TPH, and chloride from quarterly vadose zone soil samples compared to the laboratory practical quantitation limit (PQL) and background sample results as required in Rule 36 are presented in Table 2. Exceedances in MRO and TPH (by USEPA Method 418.1) were detected in the East Line Vadose Zone sample collected on March 19, 2015. The West Line Vadose Zone sample collected on March 19, 2015, exceeded the background concentration for TPH (by USEPA Method 418.1). Chloride exceeded background concentrations and PQL in the Pettigrew Vadose Zone sample collected on September 1, 2015. Any quarterly vadose zone results that exceed the higher of the PQL or background sample results for BTEX, TPH, and chloride are in bold in Table 2. The complete laboratory analytical reports are presented in Appendix A.

#### 3.3 ANNUAL VADOSE ZONE ANALYTICAL RESULTS

Per the original Rule 711 permit requirement for annual soil sampling, each vadose zone soil sample collected on March 19, 2015, was analyzed for arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, calcium, magnesium, potassium, sodium, chloride, sulfate and alkalinity. Calcium concentrations were elevated as compared to the background sample result in the West Line, East Line and Bisti source areas of the Crude Cell. Sodium was elevated in the API cell. All other analytes were within range of the background sample result. The analytical results are presented in Table 3. The complete laboratory analytical reports are presented in Appendix A.



#### 4.0 CONCLUSIONS

Concentrations of TPH and chloride in the treatment zone have been remediated to below Treatment Zone Closure Performance Standards identified in Rule 36.

Western conducted quarterly vadose zone soil sampling in accordance with the original Rule 711 permit and Rule 36, and results for BTEX, TPH, and chloride were compared to laboratory PQLs and background concentrations. In the first quarter 2015 sampling event, exceedance of TPH (by USEPA Method 418.1) was detected in the West Line source zone of the Crude Cell. In the East Line source zone of the Crude Cell, exceedances of TPH (by USEPA Method 418.1) and MRO were also detected during the first quarter of 2015. Chloride exceeded the background concentration in one sample collected from the Pettigrew source zone of the Crude Cell during the third quarter 2015 sampling event. Laboratory analytical results were consistent with historical monitoring results.

Annual soil sample results from the vadose zone were also compared to background concentrations for arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, calcium, magnesium, potassium, sodium, chloride, sulfate and alkalinity. Calcium was elevated in the West Line, East Line, and Bisti source areas of the Crude Cell. Sodium was elevated in the API Cell. However, the concentrations of all analytes were consistent with historical monitoring results.

Release response sampling was conducted on May 4, 2015, and presented to the NMOCD in July 2015 with a preliminary Action Plan. Based on comments received from NMOCD in a letter dated September 10, 2015, Western conducted additional background sampling and is revising the Action Plan, which will be submitted under a separate cover. The Action Plan will address exceedances identified in the vadose zone as Western pursues closure of the Site.



## 5.0 RECOMMENDATIONS

Since Western is no longer accepting petroleum hydrocarbon-impacted soil at the Site and treatment zone monitoring results do not exceed Treatment Zone Closure Performance Standards identified in Rule 36, Western will submit an Action Plan and pursue closure of the landfarm under a separate submittal. Western will continue monitoring the Site until a closure request is approved.



**FIGURES**



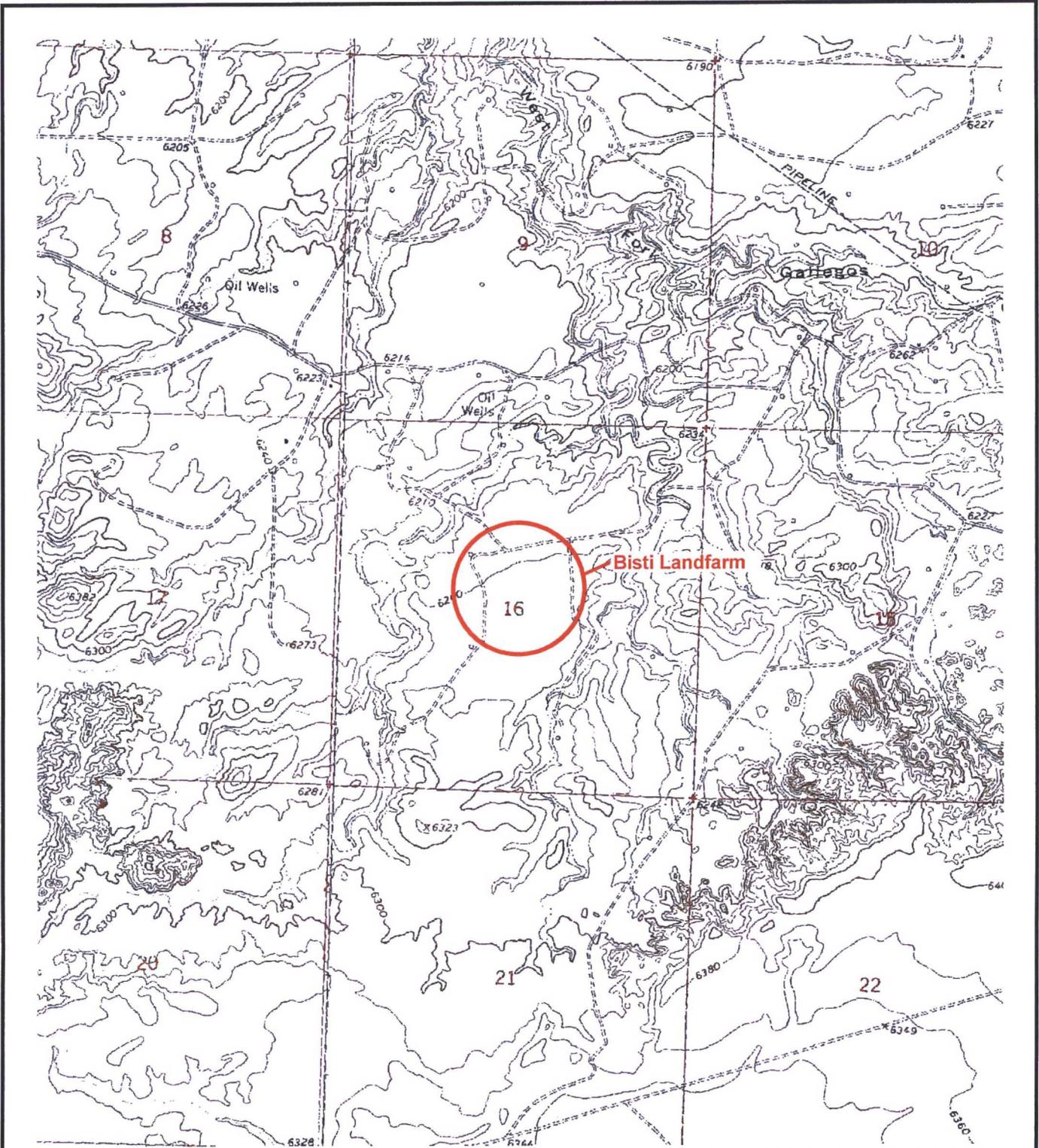
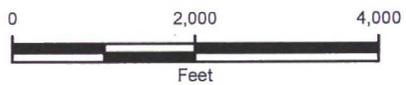


IMAGE COURTESY OF USDA/NRCS, VARIOUS DATES

**LEGEND**

 SITE LOCATION



**FIGURE 1**  
**SITE LOCATION MAP**  
**BISTI LANDFARM**  
**SEC 16 T25N R12W**  
**SAN JUAN COUNTY, NEW MEXICO**  
**WESTERN REFINING SOUTHWEST, INC.**



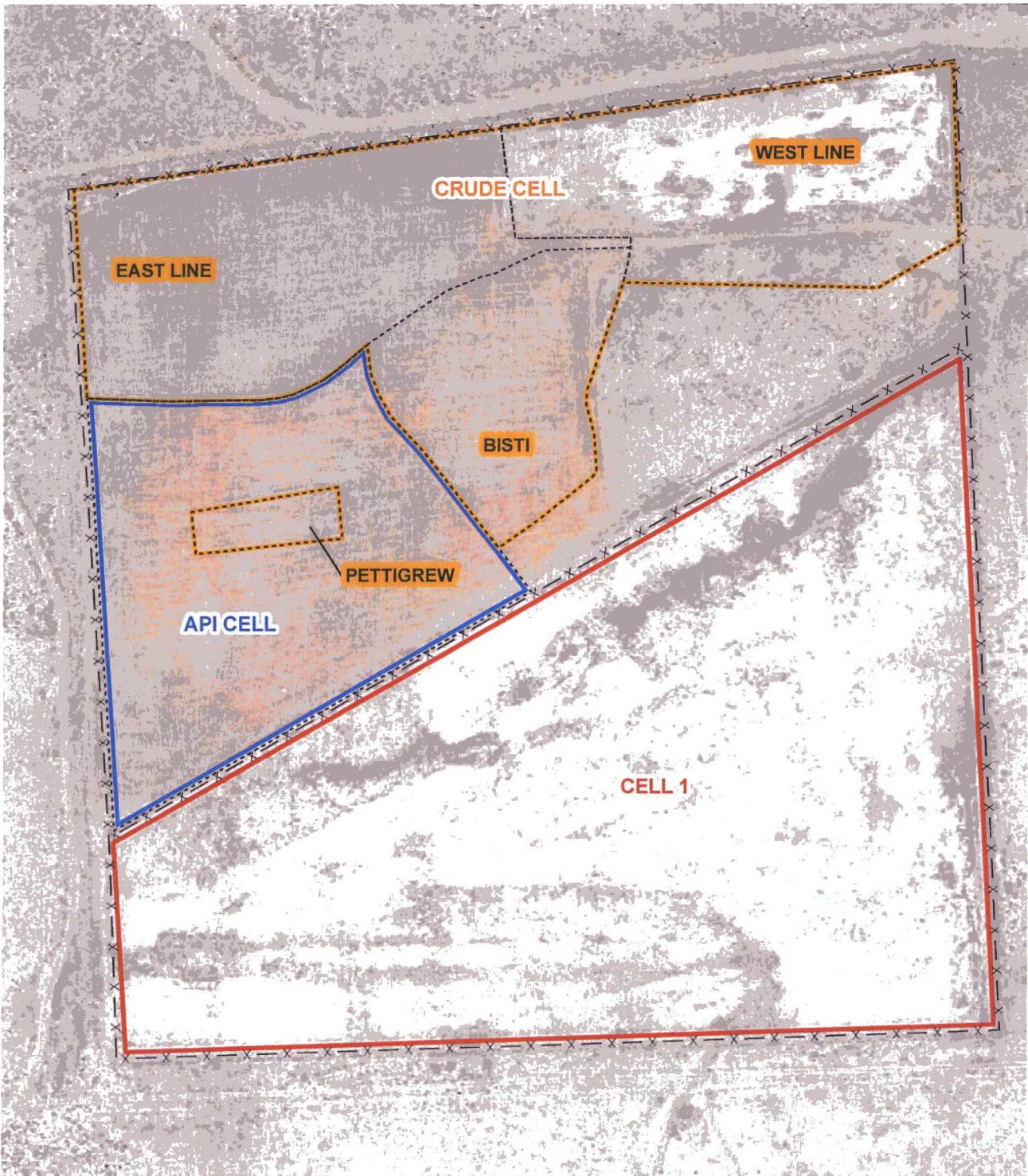


IMAGE COURTESY OF GOOGLE EARTH, 06/10/2011

**LEGEND**

- x — x FENCE
- - - - - APPROXIMATE SOURCE IDENTITY BOUNDARY
- ▭ CELL 1 BOUNDARY
- ▭ API CELL BOUNDARY
- ▭ CRUDE CELL BOUNDARY

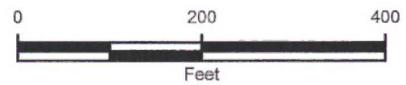


FIGURE 2  
 SITE MAP  
 BISTI LANDFARM  
 SEC 16 T25N R12W  
 SAN JUAN COUNTY, NEW MEXICO  
 WESTERN REFINING SOUTHWEST, INC.



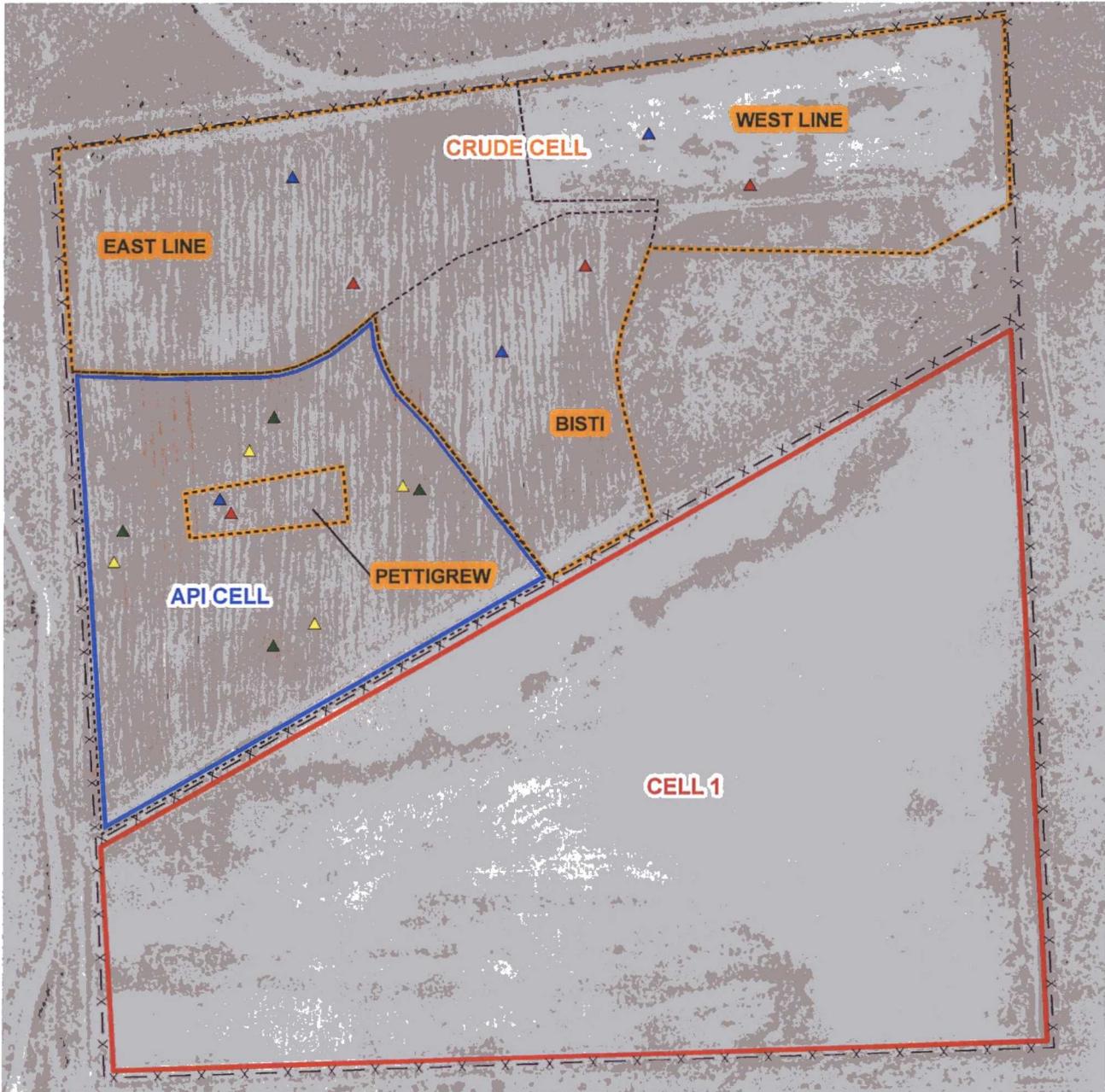


IMAGE COURTESY OF GOOGLE EARTH, 06/10/2011

**LEGEND**

- ▲ API CELL TREATMENT ZONE ALIQUOT SAMPLE (3/19/2015)
- ▲ CRUDE CELL TREATMENT ZONE ALIQUOT SAMPLE (3/19/2015)
- ▲ API CELL TREATMENT ZONE ALIQUOT SAMPLE (9/1/2015)
- ▲ CRUDE CELL TREATMENT ZONE ALIQUOT SAMPLE (9/1/2015)

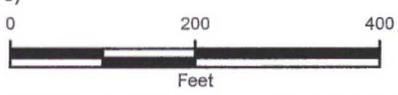
x — x FENCE

--- APPROXIMATE SOURCE IDENTITY BOUNDARY

— CELL 1 BOUNDARY

— API CELL BOUNDARY

— CRUDE CELL BOUNDARY



**FIGURE 3**  
**TREATMENT ZONE SAMPLE LOCATION MAP**  
**BISTI LANDFARM**  
**SEC 16 T25N R12W**  
**SAN JUAN COUNTY, NEW MEXICO**  
**WESTERN REFINING SOUTHWEST, INC.**



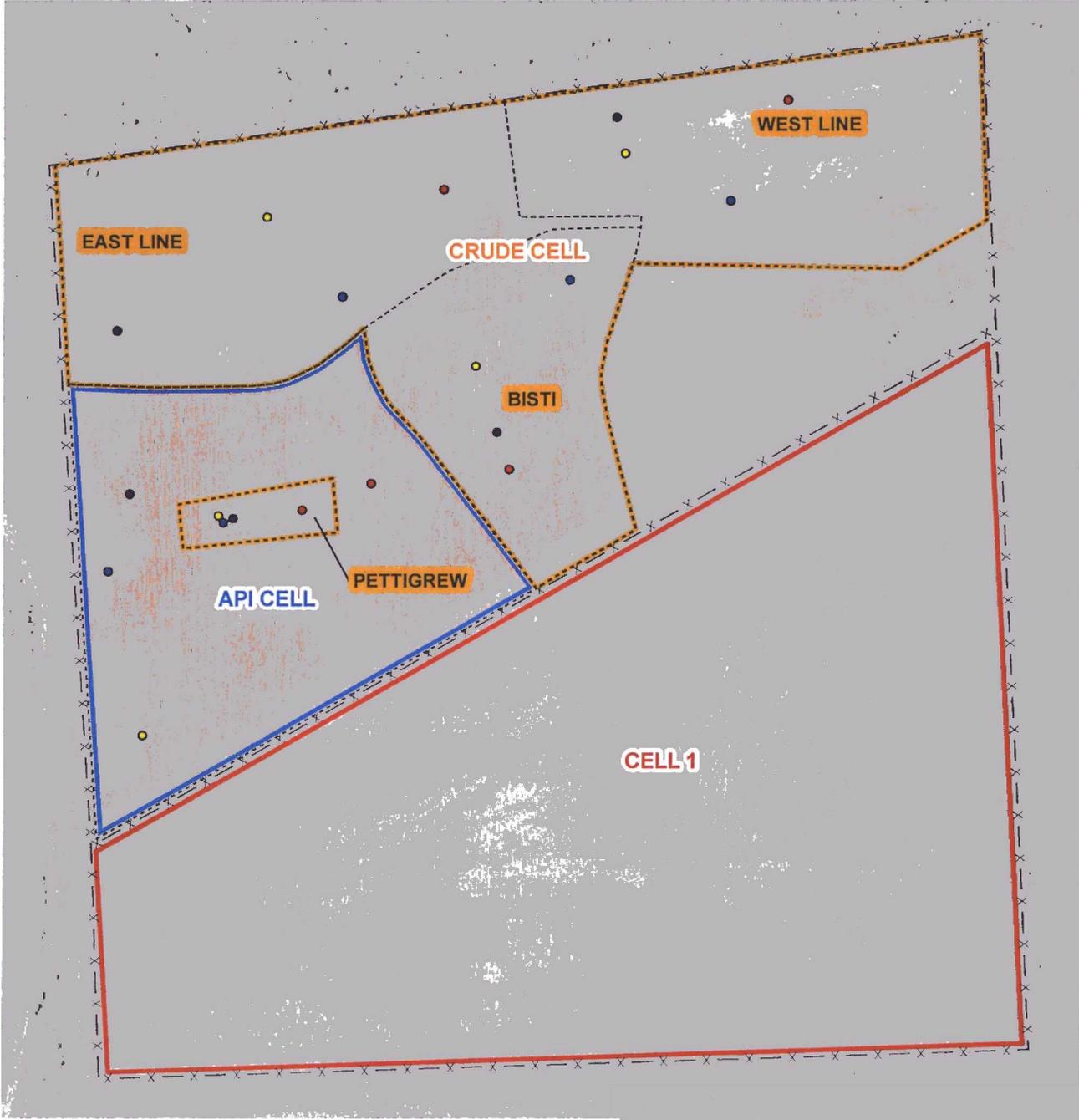
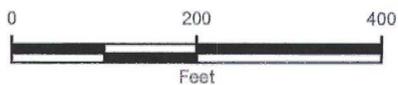


IMAGE COURTESY OF GOOGLE EARTH, 06/10/2011

**LEGEND**

- QUARTERLY VADOSE ZONE SOIL SAMPLE (COLLECTED 3/19/2015)
- QUARTERLY VADOSE ZONE SOIL SAMPLE (COLLECTED 6/28/2015)
- QUARTERLY VADOSE ZONE SOIL SAMPLE (COLLECTED 9/1/2015)
- QUARTERLY VADOSE ZONE SOIL SAMPLE (COLLECTED 12/16/2015)

- x — x FENCE
- - - - - APPROXIMATE SOURCE IDENTITY BOUNDARY
- ▭ CELL 1 BOUNDARY
- ▭ API CELL BOUNDARY
- ▭ CRUDE CELL BOUNDARY



**FIGURE 4**  
**VADOSE ZONE SAMPLE LOCATION MAP**  
**BISTI LANDFARM**  
**SEC 16 T25N R12W**  
**SAN JUAN COUNTY, NEW MEXICO**  
**WESTERN REFINING SOUTHWEST, INC.**



**TABLES**



**TABLE 1**

**2015 SEMIANNUAL TREATMENT ZONE SOIL ANALYTICAL RESULTS  
BISTI LANDFARM  
WESTERN REFINING SOUTHWEST, INC.**

Cell	Sample ID	Sample Date	GRO (mg/kg)	DRO (mg/kg)	MRO (mg/kg)	TPH 418.1 (mg/kg)	Chloride (mg/kg)
Crude Cell	Crude Cell Treatment Zone	19-Mar-15	<4.9	95	240	130	<30
	Crude Cell Treatment Zone	1-Sep-15	<4.8	<10	<50	93	72
API Cell	API Cell Treatment Zone	19-Mar-15	<4.9	15	81	63	110
	API Cell Treatment Zone	1-Sep-15	<4.9	<9.8	<49	<20	190
<b>19.15.36.15 Treatment Zone Closure Performance Standards</b>			<b>GRO + DRO = 500</b>		<b>NE</b>	<b>2,500</b>	<b>1,000</b>

**Notes:**

GRO - Gasoline Range Organics

DRO - Diesel Range Organics

MRO - Motor Oil Range Organics

TPH- Total petroleum hydrocarbons

mg/kg - milligrams per kilograms

NE - Not Established

< indicates result is less than the stated laboratory practical quantitation limit (PQL)



TABLE 2

2015 QUARTERLY VADOSE ZONE SOIL ANALYTICAL RESULTS  
 BISTI LANDFARM  
 WESTERN REFINING SOUTHWEST, INC.

Cell	Source Area	Sample ID	Sample Date	GRO (mg/kg)	DRO (mg/kg)	MRO (mg/kg)	TPH 418.1 (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Chloride (mg/kg)
Crude Cell	West Line	West Line Vadose Zone	19-Mar-15	<4.7	16	50	26	<0.047	<0.047	<0.047	<0.094	<30
		West Line Vadose Zone	26-Jun-15	<4.8	<9.7	<49	NA	<0.048	<0.048	<0.048	<0.095	NA
		West Line Vadose Zone	1-Sep-15	<4.8	<9.8	<49	<19	<0.048	<0.048	<0.048	<0.095	<30
		West Line Vadose Zone	16-Dec-15	<4.9	<9.6	<48	NA	<0.049	<0.049	<0.049	<0.098	NA
	East Line	East Line Vadose Zone	19-Mar-15	<4.9	45	61	81	<0.049	<0.049	<0.049	<0.097	<30
		East Line Vadose Zone	26-Jun-15	<4.8	<9.8	<49	NA	<0.048	<0.048	<0.048	<0.095	NA
		East Line Vadose Zone	1-Sep-15	<4.8	<10	<50	<20	<0.048	<0.048	<0.048	<0.095	<30
		East Line Vadose Zone	16-Dec-15	<4.8	10	<50	NA	<0.048	<0.048	<0.048	<0.096	NA
	Bisti	Bisti Vadose Zone	19-Mar-15	<4.9	<10	<50	<20	<0.049	<0.049	<0.049	<0.098	<30
		Bisti Vadose Zone	26-Jun-15	<4.9	<10	<50	NA	<0.049	<0.049	<0.049	<0.099	NA
		Bisti Vadose Zone	1-Sep-15	<4.8	<9.8	<49	<20	<0.048	<0.048	<0.048	<0.095	<30
		Bisti Vadose Zone	16-Dec-15	<4.8	28	<48	NA	<0.048	<0.048	<0.048	<0.096	NA
	Pettigrew	Pettigrew Vadose Zone	19-Mar-15	<5.0	<10	<50	<20	<0.050	<0.050	<0.050	<0.10	<30
		Pettigrew Vadose Zone	26-Jun-15	<4.8	<10	<50	NA	<0.048	<0.048	<0.048	<0.096	NA
		Pettigrew Vadose Zone	1-Sep-15	<5.0	<10	<51	<19	<0.050	<0.050	<0.050	<0.099	3,100
		Pettigrew Vadose Zone	16-Dec-15	<5.0	<9.6	<48	NA	<0.050	<0.050	<0.050	<0.099	NA
API Cell	API	API Vadose Zone	19-Mar-15	<5.0	<9.9	<50	<20	<0.050	<0.050	<0.050	<0.10	<30
		API Vadose Zone	26-Jun-15	<4.9	<9.9	<50	NA	<0.049	<0.049	<0.049	<0.098	NA
		API Vadose Zone	1-Sep-15	<4.8	<10	<51	<19	<0.048	<0.048	<0.048	<0.096	38
		API Vadose Zone	16-Dec-15	<4.8	<9.6	<48	NA	<0.048	<0.048	<0.048	<0.097	NA
Background Sample Result			27-Mar-98 and 1-Sep-15	<4.8*	<50	<50*	<20*	<0.05	<0.05	<0.05	<0.05	<50

## Notes:

DRO - Diesel Range Organics

GRO - Gasoline Range Organics

MRO - Motor Oil Range Organics

mg/kg - milligrams per kilograms

NA - Not Analyzed

TPH- Total Petroleum Hydrocarbons

&lt; indicates result is less than the stated laboratory method practical quantitation limit

\* - Indicates data from the September 1, 2015 background sample. All other background analytes are from the March 27, 1998 sample.

**BOLD** indicates results exceed the higher of the background sample result or practical quantitation limit

TABLE 3

2015 ANNUAL VADOSE ZONE SOIL ANALYTICAL RESULTS  
 BISTI LANDFARM  
 WESTERN REFINING SOUTHWEST, INC.

Cell	Source Area	Sample ID	Sample Date	Chloride (mg/kg)	Sulfate (mg/kg)	Alkalinity (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Calcium (mg/kg)	Chromium (mg/kg)	Lead (mg/kg)	Magnesium (mg/kg)	Potassium (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Sodium (mg/kg)	Mercury (mg/kg)
Crude Cell	West Line	West Line Vadose Zone	19-Mar-15	<30	54	534	<2.5	40	<0.10	16,000	2.7	2.3	1,700	840	<2.5	<0.25	180	<0.032
	East Line	East Line Vadose Zone	19-Mar-15	<30	190	92	<2.5	92	<0.10	3,000	2.6	2.5	1,200	860	<2.5	<0.25	97	<0.034
	Bisti	Bisti Vadose Zone	19-Mar-15	<30	<30	98	<2.4	180	<0.098	7,000	3.0	2.2	1,700	920	<2.4	<0.24	78	<0.032
	Pettigrew	Pettigrew Vadose Zone	19-Mar-15	<30	<30	84	<2.4	48	<0.097	2,300	1.7	1.7	910	600	<2.4	<0.24	78	<0.033
API Cell	API	API Vadose Zone	19-Mar-15	<30	47	259	<2.5	66	<0.10	1,300	2.3	2.7	1,100	780	<2.5	<0.25	350	<0.033
Background Sample Result			27-Mar-98	<50	140	NA	2.8	180	<1.3	2,500	<5.0	6.8	1,300	810	<2.5	<1.3	90	<0.50

## Notes:

mg/kg - milligrams per kilograms

NA - Not Analyzed

&lt; indicates result is less than the stated laboratory method practical quantitation limit



**APPENDIX A**  
**LABORATORY ANALYTICAL REPORTS**





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

March 26, 2015

Ashley Ager  
Western Refining Southwest, Inc.  
#50 CR 4990  
Bloomfield, NM 87413  
TEL: (970) 946-1093  
FAX

RE: Bisti Landfarm Treatment Zone Sampling

OrderNo.: 1503941

Dear Ashley Ager:

Hall Environmental Analysis Laboratory received 2 sample(s) on 3/20/2015 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](http://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 qualifiers 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,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a light blue horizontal line.

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109

# Hall Environmental Analysis Laboratory, Inc.

**Analytical Report**  
 Lab Order 1503941  
 Date Reported: 3/26/2015

**CLIENT:** Western Refining Southwest, Inc. **Client Sample ID:** Crude Cell Treatment Zone  
**Project:** Bisti Landfarm Treatment Zone Sampling **Collection Date:** 3/19/2015 11:40:00 AM  
**Lab ID:** 1503941-001 **Matrix:** SOIL **Received Date:** 3/20/2015 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8015D: DIESEL RANGE ORGANICS</b>							Analyst: <b>JME</b>
Diesel Range Organics (DRO)	95	10		mg/Kg	1	3/24/2015 5:07:44 PM	18271
Motor Oil Range Organics (MRO)	240	50		mg/Kg	1	3/24/2015 5:07:44 PM	18271
Surr: DNOP	125	63.5-128		%REC	1	3/24/2015 5:07:44 PM	18271
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	3/25/2015 11:37:40 AM	18259
Surr: BFB	96.0	80-120		%REC	1	3/25/2015 11:37:40 AM	18259
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>LGT</b>
Chloride	ND	30		mg/Kg	20	3/24/2015 1:33:07 PM	18295
<b>EPA METHOD 418.1: TPH</b>							Analyst: <b>BCN</b>
Petroleum Hydrocarbons, TR	130	20		mg/Kg	1	3/24/2015	18261

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 Not In Range
R	RPD outside accepted recovery limits	RL Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report  
 Lab Order 1503941  
 Date Reported: 3/26/2015

**CLIENT:** Western Refining Southwest, Inc. **Client Sample ID:** API Cell Treatment Zone  
**Project:** Bisti Landfarm Treatment Zone Sampling **Collection Date:** 3/19/2015 12:15:00 PM  
**Lab ID:** 1503941-002 **Matrix:** SOIL **Received Date:** 3/20/2015 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8015D: DIESEL RANGE ORGANICS</b>							Analyst: <b>JME</b>
Diesel Range Organics (DRO)	15	9.9		mg/Kg	1	3/24/2015 5:29:38 PM	18271
Motor Oil Range Organics (MRO)	81	50		mg/Kg	1	3/24/2015 5:29:38 PM	18271
Surr: DNOP	127	63.5-128		%REC	1	3/24/2015 5:29:38 PM	18271
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	3/25/2015 12:06:24 PM	18259
Surr: BFB	89.5	80-120		%REC	1	3/25/2015 12:06:24 PM	18259
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>LGT</b>
Chloride	110	30		mg/Kg	20	3/24/2015 2:10:21 PM	18295
<b>EPA METHOD 418.1: TPH</b>							Analyst: <b>BCN</b>
Petroleum Hydrocarbons, TR	63	20		mg/Kg	1	3/24/2015	18261

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

<b>Qualifiers:</b>	* 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 Not In Range
	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#: 1503941

26-Mar-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm Treatment Zone Sampling

Sample ID	<b>MB-18295</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 300.0: Anions</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>18295</b>	RunNo:	<b>25049</b>					
Prep Date:	<b>3/24/2015</b>	Analysis Date:	<b>3/24/2015</b>	SeqNo:	<b>739028</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	<b>LCS-18295</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 300.0: Anions</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>18295</b>	RunNo:	<b>25049</b>					
Prep Date:	<b>3/24/2015</b>	Analysis Date:	<b>3/24/2015</b>	SeqNo:	<b>739029</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	95.9	90	110			

### 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 Not In Range
- RL Reporting Detection Limit

# QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1503941

26-Mar-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm Treatment Zone Sampling

Sample ID	<b>MB-18261</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 418.1: TPH</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>18261</b>	RunNo:	<b>25036</b>					
Prep Date:	<b>3/20/2015</b>	Analysis Date:	<b>3/24/2015</b>	SeqNo:	<b>738310</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	ND	20								

Sample ID	<b>LCS-18261</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 418.1: TPH</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>18261</b>	RunNo:	<b>25036</b>					
Prep Date:	<b>3/20/2015</b>	Analysis Date:	<b>3/24/2015</b>	SeqNo:	<b>738311</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	110	20	100.0	0	107	86.7	126			

Sample ID	<b>LCSD-18261</b>	SampType:	<b>LCSD</b>	TestCode:	<b>EPA Method 418.1: TPH</b>					
Client ID:	<b>LCSS02</b>	Batch ID:	<b>18261</b>	RunNo:	<b>25036</b>					
Prep Date:	<b>3/20/2015</b>	Analysis Date:	<b>3/24/2015</b>	SeqNo:	<b>738312</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	110	20	100.0	0	107	86.7	126	10000706	20	

**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 Not In Range
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1503941

26-Mar-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm Treatment Zone Sampling

Sample ID	<b>MB-18320</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 8015D: Diesel Range Organics</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>18320</b>	RunNo:	<b>25042</b>					
Prep Date:	<b>3/25/2015</b>	Analysis Date:	<b>3/25/2015</b>	SeqNo:	<b>738863</b>	Units:	<b>%REC</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	10		10.00		104	63.5	128			

Sample ID	<b>MB-18271</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 8015D: Diesel Range Organics</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>18271</b>	RunNo:	<b>25013</b>					
Prep Date:	<b>3/23/2015</b>	Analysis Date:	<b>3/24/2015</b>	SeqNo:	<b>738864</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	11		10.00		108	63.5	128			

Sample ID	<b>LCS-18271</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 8015D: Diesel Range Organics</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>18271</b>	RunNo:	<b>25013</b>					
Prep Date:	<b>3/23/2015</b>	Analysis Date:	<b>3/24/2015</b>	SeqNo:	<b>738865</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	45	10	50.00	0	89.7	67.8	130			
Surr: DNOP	5.5		5.000		111	63.5	128			

Sample ID	<b>LCS-18320</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 8015D: Diesel Range Organics</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>18320</b>	RunNo:	<b>25042</b>					
Prep Date:	<b>3/25/2015</b>	Analysis Date:	<b>3/25/2015</b>	SeqNo:	<b>739018</b>	Units:	<b>%REC</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	5.8		5.000		116	63.5	128			

Sample ID	<b>MB-18291</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 8015D: Diesel Range Organics</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>18291</b>	RunNo:	<b>25042</b>					
Prep Date:	<b>3/24/2015</b>	Analysis Date:	<b>3/25/2015</b>	SeqNo:	<b>739019</b>	Units:	<b>%REC</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	10		10.00		101	63.5	128			

Sample ID	<b>LCS-18291</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 8015D: Diesel Range Organics</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>18291</b>	RunNo:	<b>25042</b>					
Prep Date:	<b>3/24/2015</b>	Analysis Date:	<b>3/25/2015</b>	SeqNo:	<b>739025</b>	Units:	<b>%REC</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	5.1		5.000		103	63.5	128			

**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 Not In Range
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1503941  
26-Mar-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm Treatment Zone Sampling

Sample ID <b>MB-18259</b>	SampType: <b>MBLK</b>		TestCode: <b>EPA Method 8015D: Gasoline Range</b>							
Client ID: <b>PBS</b>	Batch ID: <b>18259</b>		RunNo: <b>24979</b>							
Prep Date: <b>3/20/2015</b>	Analysis Date: <b>3/22/2015</b>		SeqNo: <b>736061</b>		Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	860		1000		85.6	80	120			

Sample ID <b>LCS-18259</b>	SampType: <b>LCS</b>		TestCode: <b>EPA Method 8015D: Gasoline Range</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>18259</b>		RunNo: <b>24979</b>							
Prep Date: <b>3/20/2015</b>	Analysis Date: <b>3/22/2015</b>		SeqNo: <b>736062</b>		Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	25.00	0	100	64	130			
Surr: BFB	960		1000		95.6	80	120			

Sample ID <b>MB-18294</b>	SampType: <b>MBLK</b>		TestCode: <b>EPA Method 8015D: Gasoline Range</b>							
Client ID: <b>PBS</b>	Batch ID: <b>18294</b>		RunNo: <b>25056</b>							
Prep Date: <b>3/24/2015</b>	Analysis Date: <b>3/25/2015</b>		SeqNo: <b>739665</b>		Units: <b>%REC</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	870		1000		87.2	80	120			

Sample ID <b>LCS-18294</b>	SampType: <b>LCS</b>		TestCode: <b>EPA Method 8015D: Gasoline Range</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>18294</b>		RunNo: <b>25056</b>							
Prep Date: <b>3/24/2015</b>	Analysis Date: <b>3/25/2015</b>		SeqNo: <b>739666</b>		Units: <b>%REC</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	930		1000		93.0	80	120			

**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 Not In Range                             |
| R RPD outside accepted recovery limits            | RL Reporting Detection Limit                         |
| S Spike Recovery outside accepted recovery limits |  |



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: **Western Refining Southw**      Work Order Number: **1503941**      RcptNo: **1**

Received by/date: *[Signature]* **03/20/15**  
 Logged By: **Lindsay Mangin**      **3/20/2015 8:30:00 AM**      *[Signature]*  
 Completed By: **Lindsay Mangin**      **3/20/2015 12:42:11 PM**      *[Signature]*  
 Reviewed By: *[Signature]*      **03/20/15**

**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	3.6	Good	Yes			



## **Treatment Zone**

TPH -GRO, DRO, MRO 8015

TPH 418.1

Chloride



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

April 17, 2015

Ashley Ager  
Western Refining Southwest, Inc.  
#50 CR 4990  
Bloomfield, NM 87413  
TEL: (970) 946-1093  
FAX

RE: Bisti Landfarm Vadose Zone Sampling

OrderNo.: 1503936

Dear Ashley Ager:

Hall Environmental Analysis Laboratory received 5 sample(s) on 3/20/2015 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued April 03, 2015.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to [www.hallenvironmental.com](http://www.hallenvironmental.com) or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

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

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1503936

Date Reported: 4/17/2015

**CLIENT:** Western Refining Southwest, Inc.

**Client Sample ID:** Westline Vadose Zone

**Project:** Bisti Landfarm Vadose Zone Sampling

**Collection Date:** 3/19/2015 10:30:00 AM

**Lab ID:** 1503936-001

**Matrix:** SOIL

**Received Date:** 3/20/2015 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8015D: DIESEL RANGE ORGANICS</b>							Analyst: <b>JME</b>
Diesel Range Organics (DRO)	16	9.8		mg/Kg	1	3/24/2015 2:35:16 PM	18271
Motor Oil Range Organics (MRO)	50	49		mg/Kg	1	3/24/2015 2:35:16 PM	18271
Surr: DNOP	116	63.5-128		%REC	1	3/24/2015 2:35:16 PM	18271
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	3/25/2015 12:19:15 AM	18259
Surr: BFB	86.5	80-120		%REC	1	3/25/2015 12:19:15 AM	18259
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>NSB</b>
Benzene	ND	0.047		mg/Kg	1	3/25/2015 12:19:15 AM	18259
Toluene	ND	0.047		mg/Kg	1	3/25/2015 12:19:15 AM	18259
Ethylbenzene	ND	0.047		mg/Kg	1	3/25/2015 12:19:15 AM	18259
Xylenes, Total	ND	0.094		mg/Kg	1	3/25/2015 12:19:15 AM	18259
Surr: 4-Bromofluorobenzene	100	80-120		%REC	1	3/25/2015 12:19:15 AM	18259
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>LGT</b>
Chloride	ND	30		mg/Kg	20	4/2/2015 11:58:10 AM	18493
Sulfate	54	30		mg/Kg	20	4/2/2015 11:58:10 AM	18493
<b>EPA METHOD 7471: MERCURY</b>							Analyst: <b>MED</b>
Mercury	ND	0.032		mg/Kg	1	3/25/2015 12:25:23 PM	18315
<b>EPA METHOD 6010B: SOIL METALS</b>							Analyst: <b>ELS</b>
Arsenic	ND	2.5		mg/Kg	1	3/25/2015 2:06:32 PM	18292
Barium	40	0.10		mg/Kg	1	3/25/2015 2:06:32 PM	18292
Cadmium	ND	0.10		mg/Kg	1	3/25/2015 2:06:32 PM	18292
Calcium	16000	130		mg/Kg	5	3/25/2015 4:10:00 PM	18292
Chromium	2.7	0.30		mg/Kg	1	3/25/2015 2:06:32 PM	18292
Lead	2.3	0.25		mg/Kg	1	3/25/2015 2:06:32 PM	18292
Magnesium	1700	25		mg/Kg	1	3/25/2015 2:06:32 PM	18292
Potassium	840	50		mg/Kg	1	3/25/2015 2:06:32 PM	18292
Selenium	ND	2.5		mg/Kg	1	3/25/2015 2:06:32 PM	18292
Silver	ND	0.25		mg/Kg	1	3/25/2015 2:06:32 PM	18292
Sodium	180	25		mg/Kg	1	3/25/2015 2:06:32 PM	18292
<b>EPA METHOD 418.1: TPH</b>							Analyst: <b>BCN</b>
Petroleum Hydrocarbons, TR	26	20		mg/Kg	1	3/24/2015	18261

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

<b>Qualifiers:</b>	* 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 Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S Spike Recovery outside accepted recovery limits	

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1503936

Date Reported: 4/17/2015

**CLIENT:** Western Refining Southwest, Inc.

**Client Sample ID:** Eastline Vadose Zone

**Project:** Bisti Landfarm Vadose Zone Sampling

**Collection Date:** 3/19/2015 10:54:00 AM

**Lab ID:** 1503936-002

**Matrix:** SOIL

**Received Date:** 3/20/2015 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8015D: DIESEL RANGE ORGANICS</b>							Analyst: <b>JME</b>
Diesel Range Organics (DRO)	45	10		mg/Kg	1	3/25/2015 5:03:04 PM	18271
Motor Oil Range Organics (MRO)	61	50		mg/Kg	1	3/25/2015 5:03:04 PM	18271
Surr: DNOP	127	63.5-128		%REC	1	3/25/2015 5:03:04 PM	18271
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	3/25/2015 12:47:56 AM	18259
Surr: BFB	85.9	80-120		%REC	1	3/25/2015 12:47:56 AM	18259
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>NSB</b>
Benzene	ND	0.049		mg/Kg	1	3/25/2015 12:47:56 AM	18259
Toluene	ND	0.049		mg/Kg	1	3/25/2015 12:47:56 AM	18259
Ethylbenzene	ND	0.049		mg/Kg	1	3/25/2015 12:47:56 AM	18259
Xylenes, Total	ND	0.097		mg/Kg	1	3/25/2015 12:47:56 AM	18259
Surr: 4-Bromofluorobenzene	99.2	80-120		%REC	1	3/25/2015 12:47:56 AM	18259
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>LGT</b>
Chloride	ND	30		mg/Kg	20	4/2/2015 12:35:24 PM	18493
Sulfate	190	30		mg/Kg	20	4/2/2015 12:35:24 PM	18493
<b>EPA METHOD 7471: MERCURY</b>							Analyst: <b>MED</b>
Mercury	ND	0.034		mg/Kg	1	3/25/2015 12:27:11 PM	18315
<b>EPA METHOD 6010B: SOIL METALS</b>							Analyst: <b>ELS</b>
Arsenic	ND	2.5		mg/Kg	1	3/25/2015 2:10:11 PM	18292
Barium	92	0.10		mg/Kg	1	3/25/2015 2:10:11 PM	18292
Cadmium	ND	0.10		mg/Kg	1	3/25/2015 2:10:11 PM	18292
Calcium	3000	25		mg/Kg	1	3/25/2015 2:10:11 PM	18292
Chromium	2.6	0.30		mg/Kg	1	3/25/2015 2:10:11 PM	18292
Lead	2.5	0.25		mg/Kg	1	3/25/2015 2:10:11 PM	18292
Magnesium	1200	25		mg/Kg	1	3/25/2015 2:10:11 PM	18292
Potassium	860	50		mg/Kg	1	3/25/2015 2:10:11 PM	18292
Selenium	ND	2.5		mg/Kg	1	3/25/2015 2:10:11 PM	18292
Silver	ND	0.25		mg/Kg	1	3/25/2015 2:10:11 PM	18292
Sodium	97	25		mg/Kg	1	3/25/2015 2:10:11 PM	18292
<b>EPA METHOD 418.1: TPH</b>							Analyst: <b>BCN</b>
Petroleum Hydrocarbons, TR	81	20		mg/Kg	1	3/24/2015	18261

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

<b>Qualifiers:</b>	*	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 Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	Spike Recovery outside accepted recovery limits		

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report  
 Lab Order 1503936  
 Date Reported: 4/17/2015

**CLIENT:** Western Refining Southwest, Inc. **Client Sample ID:** Bisti Vadose Zone  
**Project:** Bisti Landfarm Vadose Zone Sampling **Collection Date:** 3/19/2015 11:00:00 AM  
**Lab ID:** 1503936-003 **Matrix:** SOIL **Received Date:** 3/20/2015 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8015D: DIESEL RANGE ORGANICS</b>							Analyst: <b>JME</b>
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	3/24/2015 4:02:18 PM	18271
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	3/24/2015 4:02:18 PM	18271
Surr: DNOP	125	63.5-128		%REC	1	3/24/2015 4:02:18 PM	18271
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	3/25/2015 1:16:36 AM	18259
Surr: BFB	85.3	80-120		%REC	1	3/25/2015 1:16:36 AM	18259
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>NSB</b>
Benzene	ND	0.049		mg/Kg	1	3/25/2015 1:16:36 AM	18259
Toluene	ND	0.049		mg/Kg	1	3/25/2015 1:16:36 AM	18259
Ethylbenzene	ND	0.049		mg/Kg	1	3/25/2015 1:16:36 AM	18259
Xylenes, Total	ND	0.098		mg/Kg	1	3/25/2015 1:16:36 AM	18259
Surr: 4-Bromofluorobenzene	98.3	80-120		%REC	1	3/25/2015 1:16:36 AM	18259
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>LGT</b>
Chloride	ND	30		mg/Kg	20	4/2/2015 12:47:49 PM	18493
Sulfate	ND	30		mg/Kg	20	4/2/2015 12:47:49 PM	18493
<b>EPA METHOD 7471: MERCURY</b>							Analyst: <b>MED</b>
Mercury	ND	0.032		mg/Kg	1	3/25/2015 12:32:41 PM	18315
<b>EPA METHOD 6010B: SOIL METALS</b>							Analyst: <b>ELS</b>
Arsenic	ND	2.4		mg/Kg	1	3/25/2015 2:13:30 PM	18292
Barium	180	0.098		mg/Kg	1	3/25/2015 2:13:30 PM	18292
Cadmium	ND	0.098		mg/Kg	1	3/25/2015 2:13:30 PM	18292
Calcium	7000	49		mg/Kg	2	3/25/2015 2:15:17 PM	18292
Chromium	3.0	0.29		mg/Kg	1	3/25/2015 2:13:30 PM	18292
Lead	2.2	0.24		mg/Kg	1	3/25/2015 2:13:30 PM	18292
Magnesium	1700	24		mg/Kg	1	3/25/2015 2:13:30 PM	18292
Potassium	920	49		mg/Kg	1	3/25/2015 2:13:30 PM	18292
Selenium	ND	2.4		mg/Kg	1	3/25/2015 2:13:30 PM	18292
Silver	ND	0.24		mg/Kg	1	3/25/2015 2:13:30 PM	18292
Sodium	78	24		mg/Kg	1	3/25/2015 2:13:30 PM	18292
<b>EPA METHOD 418.1: TPH</b>							Analyst: <b>BCN</b>
Petroleum Hydrocarbons, TR	ND	20		mg/Kg	1	3/24/2015	18261

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

<b>Qualifiers:</b>	* 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 Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S Spike Recovery outside accepted recovery limits	

# Hall Environmental Analysis Laboratory, Inc.

**Analytical Report**  
 Lab Order 1503936  
 Date Reported: 4/17/2015

**CLIENT:** Western Refining Southwest, Inc. **Client Sample ID:** Pettigrew Vadose Zone  
**Project:** Bisti Landfarm Vadose Zone Sampling **Collection Date:** 3/19/2015 11:32:00 AM  
**Lab ID:** 1503936-004 **Matrix:** SOIL **Received Date:** 3/20/2015 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8015D: DIESEL RANGE ORGANICS</b>							Analyst: <b>JME</b>
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	3/24/2015 4:24:04 PM	18271
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	3/24/2015 4:24:04 PM	18271
Surr: DNOP	124	63.5-128		%REC	1	3/24/2015 4:24:04 PM	18271
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	3/25/2015 1:45:13 AM	18259
Surr: BFB	85.6	80-120		%REC	1	3/25/2015 1:45:13 AM	18259
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>NSB</b>
Benzene	ND	0.050		mg/Kg	1	3/25/2015 1:45:13 AM	18259
Toluene	ND	0.050		mg/Kg	1	3/25/2015 1:45:13 AM	18259
Ethylbenzene	ND	0.050		mg/Kg	1	3/25/2015 1:45:13 AM	18259
Xylenes, Total	ND	0.10		mg/Kg	1	3/25/2015 1:45:13 AM	18259
Surr: 4-Bromofluorobenzene	99.3	80-120		%REC	1	3/25/2015 1:45:13 AM	18259
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>LGT</b>
Chloride	ND	30		mg/Kg	20	4/2/2015 1:00:14 PM	18493
Sulfate	ND	30		mg/Kg	20	4/2/2015 1:00:14 PM	18493
<b>EPA METHOD 7471: MERCURY</b>							Analyst: <b>MED</b>
Mercury	ND	0.033		mg/Kg	1	3/25/2015 12:34:30 PM	18315
<b>EPA METHOD 6010B: SOIL METALS</b>							Analyst: <b>ELS</b>
Arsenic	ND	2.4		mg/Kg	1	3/25/2015 2:16:56 PM	18292
Barium	48	0.097		mg/Kg	1	3/25/2015 2:16:56 PM	18292
Cadmium	ND	0.097		mg/Kg	1	3/25/2015 2:16:56 PM	18292
Calcium	2300	24		mg/Kg	1	3/25/2015 2:16:56 PM	18292
Chromium	1.7	0.29		mg/Kg	1	3/25/2015 2:16:56 PM	18292
Lead	1.7	0.24		mg/Kg	1	3/25/2015 2:16:56 PM	18292
Magnesium	910	24		mg/Kg	1	3/25/2015 2:16:56 PM	18292
Potassium	600	49		mg/Kg	1	3/25/2015 2:16:56 PM	18292
Selenium	ND	2.4		mg/Kg	1	3/25/2015 2:16:56 PM	18292
Silver	ND	0.24		mg/Kg	1	3/25/2015 2:16:56 PM	18292
Sodium	78	24		mg/Kg	1	3/25/2015 2:16:56 PM	18292
<b>EPA METHOD 418.1: TPH</b>							Analyst: <b>BCN</b>
Petroleum Hydrocarbons, TR	ND	20		mg/Kg	1	3/24/2015	18261

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

<b>Qualifiers:</b>	* 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 Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S Spike Recovery outside accepted recovery limits	

# Hall Environmental Analysis Laboratory, Inc.

**Analytical Report**  
 Lab Order 1503936  
 Date Reported: 4/17/2015

**CLIENT:** Western Refining Southwest, Inc. **Client Sample ID:** API Vadose Zone  
**Project:** Bisti Landfarm Vadose Zone Sampling **Collection Date:** 3/19/2015 11:56:00 AM  
**Lab ID:** 1503936-005 **Matrix:** SOIL **Received Date:** 3/20/2015 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8015D: DIESEL RANGE ORGANICS</b>							Analyst: <b>JME</b>
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	3/24/2015 4:46:00 PM	18271
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	3/24/2015 4:46:00 PM	18271
Surr: DNOP	117	63.5-128		%REC	1	3/24/2015 4:46:00 PM	18271
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	3/25/2015 2:13:51 AM	18259
Surr: BFB	86.6	80-120		%REC	1	3/25/2015 2:13:51 AM	18259
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>NSB</b>
Benzene	ND	0.050		mg/Kg	1	3/25/2015 2:13:51 AM	18259
Toluene	ND	0.050		mg/Kg	1	3/25/2015 2:13:51 AM	18259
Ethylbenzene	ND	0.050		mg/Kg	1	3/25/2015 2:13:51 AM	18259
Xylenes, Total	ND	0.10		mg/Kg	1	3/25/2015 2:13:51 AM	18259
Surr: 4-Bromofluorobenzene	102	80-120		%REC	1	3/25/2015 2:13:51 AM	18259
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>LGT</b>
Chloride	ND	30		mg/Kg	20	4/2/2015 1:37:28 PM	18493
Sulfate	47	30		mg/Kg	20	4/2/2015 1:37:28 PM	18493
<b>EPA METHOD 7471: MERCURY</b>							Analyst: <b>MED</b>
Mercury	ND	0.033		mg/Kg	1	3/25/2015 12:36:19 PM	18315
<b>EPA METHOD 6010B: SOIL METALS</b>							Analyst: <b>ELS</b>
Arsenic	ND	2.5		mg/Kg	1	3/25/2015 2:25:35 PM	18292
Barium	66	0.10		mg/Kg	1	3/25/2015 2:25:35 PM	18292
Cadmium	ND	0.10		mg/Kg	1	3/25/2015 2:25:35 PM	18292
Calcium	1300	25		mg/Kg	1	3/25/2015 2:25:35 PM	18292
Chromium	2.3	0.30		mg/Kg	1	3/25/2015 2:25:35 PM	18292
Lead	2.7	0.25		mg/Kg	1	3/25/2015 2:25:35 PM	18292
Magnesium	1100	25		mg/Kg	1	3/25/2015 2:25:35 PM	18292
Potassium	780	50		mg/Kg	1	3/25/2015 2:25:35 PM	18292
Selenium	ND	2.5		mg/Kg	1	3/25/2015 2:25:35 PM	18292
Silver	ND	0.25		mg/Kg	1	3/25/2015 2:25:35 PM	18292
Sodium	350	25		mg/Kg	1	3/25/2015 2:25:35 PM	18292
<b>EPA METHOD 418.1: TPH</b>							Analyst: <b>BCN</b>
Petroleum Hydrocarbons, TR	ND	20		mg/Kg	1	3/24/2015	18261

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

<b>Qualifiers:</b>	*	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 Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	Spike Recovery outside accepted recovery limits		



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**LABORATORY ANALYTICAL REPORT**

Prepared by Billings, MT Branch

**Client:** Hall Environmental  
**Project:** Not Indicated  
**Client Sample ID:** 1503936-001B, Westline Vadose Zone  
**Location:**  
**Lab ID:** B15031855-001

**Report Date:** 04/01/15  
**Collection Date:** 03/19/15 10:30  
**Date Received:** 03/24/15  
**Sampled By:** Not Provided

Analyses	Result	Units	Qualifier	Method	Analysis Date / By
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**CHEMICAL CHARACTERISTICS**

Alkalinity, 1:2	534	mg/kg	D	ASA10-3	03/31/15 15:56 / rbf
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**Report** RL - Analyte reporting limit.  
**Definitions:** QCL - Quality control limit.  
D - RL increased due to sample matrix.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.



**LABORATORY ANALYTICAL REPORT**  
Prepared by Billings, MT Branch

**Client:** Hall Environmental  
**Project:** Not Indicated  
**Client Sample ID:** 1503936-002B, Eastline Vadose Zone  
**Location:**  
**Lab ID:** B15031855-002

**Report Date:** 04/01/15  
**Collection Date:** 03/19/15 10:54  
**Date Received:** 03/24/15  
**Sampled By:** Not Provided

**Analyses** **Result** **Units** **Qualifier** **Method** **Analysis Date / By**

**CHEMICAL CHARACTERISTICS**

Alkalinity, 1:2 92 mg/kg D ASA10-3 03/31/15 16:30 / rbf

**Report** RL - Analyte reporting limit.  
**Definitions:** QCL - Quality control limit.  
D - RL increased due to sample matrix.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.



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**LABORATORY ANALYTICAL REPORT**  
Prepared by Billings, MT Branch

**Client:** Hall Environmental  
**Project:** Not Indicated  
**Client Sample ID:** 1503936-003B, Bisti Vadose Zone  
**Location:**  
**Lab ID:** B15031855-003

**Report Date:** 04/01/15  
**Collection Date:** 03/19/15 11:00  
**Date Received:** 03/24/15  
**Sampled By:** Not Provided

Analyses	Result	Units	Qualifier	Method	Analysis Date / By
<b>CHEMICAL CHARACTERISTICS</b>					
Alkalinity, 1:2	98	mg/kg	D	ASA10-3	03/31/15 16:46 / rbf

**Report Definitions:** RL - Analyte reporting limit.  
QCL - Quality control limit.  
D - RL increased due to sample matrix.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.



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### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Hall Environmental  
**Project:** Not Indicated  
**Client Sample ID:** 1503936-004B, Pettigrew Vadose Zone  
**Location:**  
**Lab ID:** B15031855-004

**Report Date:** 04/01/15  
**Collection Date:** 03/19/15 11:32  
**Date Received:** 03/24/15  
**Sampled By:** Not Provided

**Analyses**

Result	Units	Qualifier	Method	Analysis Date / By
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**CHEMICAL CHARACTERISTICS**

Alkalinity, 1:2	84 mg/kg	D	ASA10-3	03/31/15 16:55 / rbf
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**Report Definitions:** RL - Analyte reporting limit.  
 QCL - Quality control limit.  
 D - RL increased due to sample matrix.

MCL - Maximum contaminant level.  
 ND - Not detected at the reporting limit.



### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Hall Environmental  
**Project:** Not Indicated  
**Client Sample ID:** 1503936-005B, API Vadose Zone  
**Location:**  
**Lab ID:** B15031855-005

**Report Date:** 04/01/15  
**Collection Date:** 03/19/15 11:56  
**Date Received:** 03/24/15  
**Sampled By:** Not Provided

Analyses	Result	Units	Qualifier	Method	Analysis Date / By
<b>CHEMICAL CHARACTERISTICS</b>					
Alkalinity, 1:2	259	mg/kg	D	ASA10-3	03/31/15 17:00 / rbf

**Report Definitions:**  
 RL - Analyte reporting limit.  
 QCL - Quality control limit.  
 D - RL increased due to sample matrix.

MCL - Maximum contaminant level.  
 ND - Not detected at the reporting limit.

**QA/QC Summary Report**

Prepared by Billings, MT Branch

Client: Hall Environmental

Report Date: 04/01/15

Project: Not Indicated

Work Order: B15031855

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: ASA10-3										Batch: 88204
Lab ID: LCS-88204		Laboratory Control Sample								Run: ORION555A_150331B 03/31/15 15:50
Alkalinity, 1:2		104	mg/kg	4.0	74	50	150			
Lab ID: B15031855-001ADUP		Sample Duplicate								Run: ORION555A_150331B 03/31/15 16:22
Alkalinity, 1:2		626	mg/kg	4.0				16	30	

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1503936

17-Apr-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm Vadose Zone Sampling

Sample ID	<b>MB-18493</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 300.0: Anions</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>18493</b>	RunNo:	<b>25277</b>					
Prep Date:	<b>4/2/2015</b>	Analysis Date:	<b>4/2/2015</b>	SeqNo:	<b>747465</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								
Sulfate	ND	1.5								

Sample ID	<b>LCS-18493</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 300.0: Anions</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>18493</b>	RunNo:	<b>25277</b>					
Prep Date:	<b>4/2/2015</b>	Analysis Date:	<b>4/2/2015</b>	SeqNo:	<b>747466</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	92.5	90	110			
Sulfate	29	1.5	30.00	0	97.2	90	110			

**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 Not In Range
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1503936

17-Apr-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm Vadose Zone Sampling

Sample ID: <b>MB-18261</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 418.1: TPH</b>								
Client ID: <b>PBS</b>	Batch ID: <b>18261</b>	RunNo: <b>25036</b>								
Prep Date: <b>3/20/2015</b>	Analysis Date: <b>3/24/2015</b>	SeqNo: <b>738310</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	ND	20								

Sample ID: <b>LCS-18261</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 418.1: TPH</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>18261</b>	RunNo: <b>25036</b>								
Prep Date: <b>3/20/2015</b>	Analysis Date: <b>3/24/2015</b>	SeqNo: <b>738311</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	110	20	100.0	0	107	86.7	126			

Sample ID: <b>LCSD-18261</b>	SampType: <b>LCSD</b>	TestCode: <b>EPA Method 418.1: TPH</b>								
Client ID: <b>LCSS02</b>	Batch ID: <b>18261</b>	RunNo: <b>25036</b>								
Prep Date: <b>3/20/2015</b>	Analysis Date: <b>3/24/2015</b>	SeqNo: <b>738312</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	110	20	100.0	0	107	86.7	126	10000706	20	

**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 Not In Range
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1503936

17-Apr-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm Vadose Zone Sampling

Sample ID	<b>MB-18271</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 8015D: Diesel Range Organics</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>18271</b>	RunNo:	<b>25013</b>					
Prep Date:	<b>3/23/2015</b>	Analysis Date:	<b>3/24/2015</b>	SeqNo:	<b>738864</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	11		10.00		108	63.5	128			

Sample ID	<b>LCS-18271</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 8015D: Diesel Range Organics</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>18271</b>	RunNo:	<b>25013</b>					
Prep Date:	<b>3/23/2015</b>	Analysis Date:	<b>3/24/2015</b>	SeqNo:	<b>738865</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	45	10	50.00	0	89.7	67.8	130			
Surr: DNOP	5.5		5.000		111	63.5	128			

Sample ID	<b>1503936-001AMS</b>	SampType:	<b>MS</b>	TestCode:	<b>EPA Method 8015D: Diesel Range Organics</b>					
Client ID:	<b>Westline Vadose Zo</b>	Batch ID:	<b>18271</b>	RunNo:	<b>25013</b>					
Prep Date:	<b>3/23/2015</b>	Analysis Date:	<b>3/24/2015</b>	SeqNo:	<b>738893</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	47	10	49.90	15.82	62.2	29.2	176			
Surr: DNOP	6.1		4.990		123	63.5	128			

Sample ID	<b>1503936-001AMSD</b>	SampType:	<b>MSD</b>	TestCode:	<b>EPA Method 8015D: Diesel Range Organics</b>					
Client ID:	<b>Westline Vadose Zo</b>	Batch ID:	<b>18271</b>	RunNo:	<b>25013</b>					
Prep Date:	<b>3/23/2015</b>	Analysis Date:	<b>3/24/2015</b>	SeqNo:	<b>738894</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	51	9.9	49.46	15.82	71.1	29.2	176	8.46	23	
Surr: DNOP	6.7		4.946		136	63.5	128	0	0	S

**Qualifiers:**

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- E Value above quantitation range
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- 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 Not In Range
- RL Reporting Detection Limit

**QC SUMMARY REPORT**  
**Hall Environmental Analysis Laboratory, Inc.**

WO#: 1503936  
 17-Apr-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm Vadose Zone Sampling

Sample ID: <b>MB-18259</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015D: Gasoline Range</b>								
Client ID: <b>PBS</b>	Batch ID: <b>18259</b>	RunNo: <b>24979</b>								
Prep Date: <b>3/20/2015</b>	Analysis Date: <b>3/22/2015</b>	SeqNo: <b>736061</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	860		1000		85.6	80	120			

Sample ID: <b>LCS-18259</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8015D: Gasoline Range</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>18259</b>	RunNo: <b>24979</b>								
Prep Date: <b>3/20/2015</b>	Analysis Date: <b>3/22/2015</b>	SeqNo: <b>736062</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	25.00	0	100	64	130			
Surr: BFB	960		1000		95.6	80	120			

**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 Not In Range
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1503936

17-Apr-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm Vadose Zone Sampling

Sample ID	<b>MB-18259</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 8021B: Volatiles</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>18259</b>	RunNo:	<b>24979</b>					
Prep Date:	<b>3/20/2015</b>	Analysis Date:	<b>3/22/2015</b>	SeqNo:	<b>736083</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.050								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.0		1.000		103	80	120			

Sample ID	<b>LCS-18259</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 8021B: Volatiles</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>18259</b>	RunNo:	<b>24979</b>					
Prep Date:	<b>3/20/2015</b>	Analysis Date:	<b>3/22/2015</b>	SeqNo:	<b>736084</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.3	0.050	1.000	0	126	76.6	128			
Toluene	1.2	0.050	1.000	0	119	75	124			
Ethylbenzene	1.2	0.050	1.000	0	119	79.5	126			
Xylenes, Total	3.5	0.10	3.000	0	118	78.8	124			
Surr: 4-Bromofluorobenzene	1.1		1.000		112	80	120			

**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 Not In Range
- RL Reporting Detection Limit

**QC SUMMARY REPORT**  
**Hall Environmental Analysis Laboratory, Inc.**

WO#: 1503936  
 17-Apr-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm Vadose Zone Sampling

Sample ID	<b>MB-18315</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 7471: Mercury</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>18315</b>	RunNo:	<b>25053</b>					
Prep Date:	<b>3/24/2015</b>	Analysis Date:	<b>3/25/2015</b>	SeqNo:	<b>739177</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.033								

Sample ID	<b>LCS-18315</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 7471: Mercury</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>18315</b>	RunNo:	<b>25053</b>					
Prep Date:	<b>3/24/2015</b>	Analysis Date:	<b>3/25/2015</b>	SeqNo:	<b>739178</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.17	0.033	0.1667	0	102	80	120			

**Qualifiers:**

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- 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 Not In Range
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1503936

17-Apr-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm Vadose Zone Sampling

Sample ID	<b>MB-18292</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 6010B: Soil Metals</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>18292</b>	RunNo:	<b>25054</b>					
Prep Date:	<b>3/24/2015</b>	Analysis Date:	<b>3/25/2015</b>	SeqNo:	<b>739222</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	2.5								
Barium	ND	0.10								
Cadmium	ND	0.10								
Calcium	ND	25								
Chromium	ND	0.30								
Lead	ND	0.25								
Magnesium	ND	25								
Potassium	ND	50								
Selenium	ND	2.5								
Silver	ND	0.25								
Sodium	ND	25								

Sample ID	<b>LCS-18292</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 6010B: Soil Metals</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>18292</b>	RunNo:	<b>25054</b>					
Prep Date:	<b>3/24/2015</b>	Analysis Date:	<b>3/25/2015</b>	SeqNo:	<b>739223</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	25	2.5	25.00	0	102	80	120			
Barium	24	0.10	25.00	0	94.7	80	120			
Cadmium	24	0.10	25.00	0	96.1	80	120			
Calcium	2700	25	2500	0	107	80	120			
Chromium	24	0.30	25.00	0	94.9	80	120			
Lead	25	0.25	25.00	0	99.4	80	120			
Magnesium	2600	25	2500	0	105	80	120			
Potassium	2500	50	2500	0	99.7	80	120			
Selenium	25	2.5	25.00	0	101	80	120			
Silver	5.4	0.25	5.000	0	108	80	120			
Sodium	2600	25	2500	0	103	80	120			

Sample ID	<b>ADOC1-18292</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 6010B: Soil Metals</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>18292</b>	RunNo:	<b>25054</b>					
Prep Date:	<b>3/24/2015</b>	Analysis Date:	<b>3/25/2015</b>	SeqNo:	<b>739229</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	26	2.5	25.00	0	103	80	120	0.487	0	
Barium	24	0.10	25.00	0	95.2	80	120	0.519	0	
Cadmium	24	0.10	25.00	0	96.2	80	120	0.663	0	
Calcium	2700	25	2500	0	107	80	120	1.82	0	
Chromium	24	0.30	25.00	0	95.6	80	120	0.903	0	
Lead	25	0.25	25.00	0	100	80	120	0.291	0	

**Qualifiers:**

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- 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 Not In Range
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1503936

17-Apr-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm Vadose Zone Sampling

Sample ID	ADOC1-TESTES		SampType: LCS	TestCode: EPA Method 6010B: Soil Metals						
Client ID:	LCSS		Batch ID: 18292	RunNo: 25054						
Prep Date:	3/24/2015		Analysis Date: 3/25/2015	SeqNo: 739229	Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Magnesium	2600	25	2500	0	105	80	120	2.17	0	
Potassium	2500	50	2500	0	99.4	80	120	2.03	0	
Selenium	25	2.5	25.00	0	101	80	120	1.56	0	
Silver	5.4	0.25	5.000	0	109	80	120	0.797	0	
Sodium	2600	25	2500	0	103	80	120	2.01	0	

Sample ID	ADOC2-TESTES		SampType: LCS	TestCode: EPA Method 6010B: Soil Metals						
Client ID:	LCSS		Batch ID: 18292	RunNo: 25054						
Prep Date:	3/24/2015		Analysis Date: 3/25/2015	SeqNo: 739230	Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	26	2.5	25.00	0	104	80	120			
Barium	24	0.10	25.00	0	94.8	80	120			
Cadmium	24	0.10	25.00	0	95.7	80	120			
Calcium	2700	25	2500	0	107	80	120			
Chromium	24	0.30	25.00	0	95.1	80	120			
Lead	25	0.25	25.00	0	98.8	80	120			
Magnesium	2600	25	2500	0	106	80	120			
Potassium	2500	50	2500	0	100	80	120			
Selenium	25	2.5	25.00	0	98.9	80	120			
Silver	5.4	0.25	5.000	0	108	80	120			
Sodium	2600	25	2500	0	104	80	120			

Sample ID	ADOC3-TESTES		SampType: LCS	TestCode: EPA Method 6010B: Soil Metals						
Client ID:	LCSS		Batch ID: 18292	RunNo: 25054						
Prep Date:	3/24/2015		Analysis Date: 3/25/2015	SeqNo: 739231	Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	26	2.5	25.00	0	105	80	120			
Barium	24	0.10	25.00	0	96.6	80	120			
Cadmium	24	0.10	25.00	0	97.5	80	120			
Calcium	2700	25	2500	0	109	80	120			
Chromium	24	0.30	25.00	0	96.5	80	120			
Lead	25	0.25	25.00	0	100	80	120			
Magnesium	2700	25	2500	0	107	80	120			
Potassium	2500	50	2500	0	102	80	120			
Selenium	26	2.5	25.00	0	104	80	120			
Silver	5.5	0.25	5.000	0	110	80	120			
Sodium	2600	25	2500	0	105	80	120			

**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 Not In Range
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1503936  
17-Apr-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm Vadose Zone Sampling

Sample ID	ADOCP4-TES	SampType:	LCS	TestCode:	EPA Method 6010B: Soil Metals					
Client ID:	LCSS	Batch ID:	18292	RunNo:	25054					
Prep Date:	3/24/2015	Analysis Date:	3/25/2015	SeqNo:	739232	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	26	2.5	25.00	0	105	80	120			
Barium	24	0.10	25.00	0	96.3	80	120			
Cadmium	24	0.10	25.00	0	97.4	80	120			
Calcium	2700	25	2500	0	108	80	120			
Chromium	24	0.30	25.00	0	96.8	80	120			
Lead	25	0.25	25.00	0	101	80	120			
Magnesium	2700	25	2500	0	110	80	120			
Potassium	2600	50	2500	0	104	80	120			
Selenium	25	2.5	25.00	0	100	80	120			
Silver	5.5	0.25	5.000	0	111	80	120			
Sodium	2700	25	2500	0	108	80	120			

**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 Not In Range
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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: **Western Refining Southw**      Work Order Number: **1503936**      RcptNo: **1**

Received by/date: *[Signature]* **03/20/15**  
 Logged By: **Lindsay Mangin**      **3/20/2015 8:30:00 AM**      *[Signature]*  
 Completed By: **Lindsay Mangin**      **3/20/2015 12:16:41 PM**      *[Signature]*  
 Reviewed By: *[Signature]*      **03/20/15**

**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	3.6	Good	Yes			

# Chain-of-Custody Record

Client: Western Refining

Mailing Address: 111 CR 4990  
Bloomfield, NM 87413

Phone #: (505) 632-8013

Email or Fax#: Kelly Robinson @ WNR.com

QA/QC Package:  
 Standard       Level 4 (Full Validation)

Accreditation  
 NELAP       Other \_\_\_\_\_

EDD (Type) \_\_\_\_\_

Turn-Around Time:  
 Standard       Rush

Project Name: Bisti Landfarm Vadose Zone Sampling

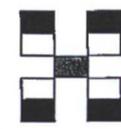
Project #: WR1005

Project Manager: Ashley Ager

Sampler: Dan Newman / Mike Wicker

On Ice:  Yes       No

Sample Temperature: 36



## 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 8015B (GRO / DRO / MFO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F, Cl, NO <sub>3</sub> , NO <sub>2</sub> , PO <sub>4</sub> , SO <sub>4</sub> )	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	See Attached	Air Bubbles (Y or N)	
19/15	1030	Soil	Westline Vadose Zone	2 Jars (4oz)	Cool	1503936 -001														
	1054		Eastline Vadose Zone			-002														
	1100		Bisti Vadose Zone			-003														
	1132		Pettigrew Vadose Zone			-004														
	1156		API Vadose Zone			-005														

Date: 1/19/15 Time: 1606 Relinquished by: [Signature]

Date: 1/19/15 Time: 1825 Relinquished by: Christine Webster

Received by: Christ. Webster Date: 3/19/15 Time: 1606

Received by: [Signature] Date: 03/20/15 Time: 0830

Remarks: Please copy results to: AAger@LTEnv.com

Specimens 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.

## Vadose Zone

TPH –GRO, DRO, MRO 8015

TPH 418.1

BTEX 8021

Chloride

Sulfate

Alkalinity

Arsenic

Barium

Cadmium

Calcium

Chromium

Lead

Magnesium

Potassium

Selenium

Silver

Sodium

Mercury



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

July 06, 2015

Kelly Robinson

Western Refining Southwest, Inc.

#50 CR 4990

Bloomfield, NM 87413

TEL: (505) 632-4166

FAX (505) 632-3911

RE: Bisti Landfarm Vadose Zone

OrderNo.: 1506D27

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 5 sample(s) on 6/27/2015 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](http://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 qualifiers 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,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a white background.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

**Hall Environmental Analysis Laboratory, Inc.**

**Analytical Report**  
 Lab Order **1506D27**  
 Date Reported: **7/6/2015**

**CLIENT:** Western Refining Southwest, Inc. **Client Sample ID:** Westline Vadose Zone  
**Project:** Bisti Landfarm Vadose Zone **Collection Date:** 6/26/2015 12:10:00 PM  
**Lab ID:** 1506D27-001 **Matrix:** SOIL **Received Date:** 6/27/2015 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>KJH</b>
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	7/2/2015 2:00:24 AM	20026
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	7/2/2015 2:00:24 AM	20026
Surr: DNOP	98.2	57.9-140		%REC	1	7/2/2015 2:00:24 AM	20026
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	6/30/2015 3:55:47 PM	20005
Surr: BFB	89.2	75.4-113		%REC	1	6/30/2015 3:55:47 PM	20005
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>NSB</b>
Benzene	ND	0.048		mg/Kg	1	6/30/2015 3:55:47 PM	20005
Toluene	ND	0.048		mg/Kg	1	6/30/2015 3:55:47 PM	20005
Ethylbenzene	ND	0.048		mg/Kg	1	6/30/2015 3:55:47 PM	20005
Xylenes, Total	ND	0.095		mg/Kg	1	6/30/2015 3:55:47 PM	20005
Surr: 4-Bromofluorobenzene	92.7	80-120		%REC	1	6/30/2015 3:55:47 PM	20005

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 Not In Range
R	RPD outside accepted recovery limits	RL Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report  
 Lab Order 1506D27  
 Date Reported: 7/6/2015

**CLIENT:** Western Refining Southwest, Inc. **Client Sample ID:** Eastline Vadose Zone  
**Project:** Bisti Landfarm Vadose Zone **Collection Date:** 6/26/2015 12:30:00 PM  
**Lab ID:** 1506D27-002 **Matrix:** SOIL **Received Date:** 6/27/2015 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>KJH</b>
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	7/2/2015 2:21:56 AM	20026
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	7/2/2015 2:21:56 AM	20026
Surr: DNOP	97.4	57.9-140		%REC	1	7/2/2015 2:21:56 AM	20026
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	6/30/2015 4:24:36 PM	20005
Surr: BFB	89.6	75.4-113		%REC	1	6/30/2015 4:24:36 PM	20005
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>NSB</b>
Benzene	ND	0.048		mg/Kg	1	6/30/2015 4:24:36 PM	20005
Toluene	ND	0.048		mg/Kg	1	6/30/2015 4:24:36 PM	20005
Ethylbenzene	ND	0.048		mg/Kg	1	6/30/2015 4:24:36 PM	20005
Xylenes, Total	ND	0.095		mg/Kg	1	6/30/2015 4:24:36 PM	20005
Surr: 4-Bromofluorobenzene	94.7	80-120		%REC	1	6/30/2015 4:24:36 PM	20005

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 Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1506D27

Date Reported: 7/6/2015

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: Bisti Vadose Zone

Project: Bisti Landfarm Vadose Zone

Collection Date: 6/26/2015 11:40:00 AM

Lab ID: 1506D27-003

Matrix: SOIL

Received Date: 6/27/2015 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>KJH</b>
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	7/2/2015 2:43:18 AM	20026
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/2/2015 2:43:18 AM	20026
Surr: DNOP	97.7	57.9-140		%REC	1	7/2/2015 2:43:18 AM	20026
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	6/30/2015 4:53:21 PM	20005
Surr: BFB	87.6	75.4-113		%REC	1	6/30/2015 4:53:21 PM	20005
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>NSB</b>
Benzene	ND	0.049		mg/Kg	1	6/30/2015 4:53:21 PM	20005
Toluene	ND	0.049		mg/Kg	1	6/30/2015 4:53:21 PM	20005
Ethylbenzene	ND	0.049		mg/Kg	1	6/30/2015 4:53:21 PM	20005
Xylenes, Total	ND	0.099		mg/Kg	1	6/30/2015 4:53:21 PM	20005
Surr: 4-Bromofluorobenzene	90.8	80-120		%REC	1	6/30/2015 4:53:21 PM	20005

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 Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1506D27

Date Reported: 7/6/2015

**CLIENT:** Western Refining Southwest, Inc.

**Client Sample ID:** Pettigrew Vagose Zone

**Project:** Bisti Landfarm Vadose Zone

**Collection Date:** 6/26/2015 11:35:00 AM

**Lab ID:** 1506D27-004

**Matrix:** SOIL

**Received Date:** 6/27/2015 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>KJH</b>
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	7/2/2015 3:04:50 AM	20026
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/2/2015 3:04:50 AM	20026
Surr: DNOP	90.9	57.9-140		%REC	1	7/2/2015 3:04:50 AM	20026
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	7/2/2015 12:13:24 AM	20005
Surr: BFB	86.5	75.4-113		%REC	1	7/2/2015 12:13:24 AM	20005
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>NSB</b>
Benzene	ND	0.048		mg/Kg	1	7/2/2015 12:13:24 AM	20005
Toluene	ND	0.048		mg/Kg	1	7/2/2015 12:13:24 AM	20005
Ethylbenzene	ND	0.048		mg/Kg	1	7/2/2015 12:13:24 AM	20005
Xylenes, Total	ND	0.096		mg/Kg	1	7/2/2015 12:13:24 AM	20005
Surr: 4-Bromofluorobenzene	88.7	80-120		%REC	1	7/2/2015 12:13:24 AM	20005

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 Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

**Hall Environmental Analysis Laboratory, Inc.**

**Analytical Report**  
 Lab Order **1506D27**  
 Date Reported: **7/6/2015**

**CLIENT:** Western Refining Southwest, Inc. **Client Sample ID:** API Vadose Zone  
**Project:** Bisti Landfarm Vadose Zone **Collection Date:** 6/26/2015 11:25:00 AM  
**Lab ID:** 1506D27-005 **Matrix:** SOIL **Received Date:** 6/27/2015 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>KJH</b>
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	7/2/2015 3:26:12 AM	20026
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/2/2015 3:26:12 AM	20026
Surr: DNOP	90.6	57.9-140		%REC	1	7/2/2015 3:26:12 AM	20026
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/2/2015 12:42:08 AM	20005
Surr: BFB	87.8	75.4-113		%REC	1	7/2/2015 12:42:08 AM	20005
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>NSB</b>
Benzene	ND	0.049		mg/Kg	1	7/2/2015 12:42:08 AM	20005
Toluene	ND	0.049		mg/Kg	1	7/2/2015 12:42:08 AM	20005
Ethylbenzene	ND	0.049		mg/Kg	1	7/2/2015 12:42:08 AM	20005
Xylenes, Total	ND	0.098		mg/Kg	1	7/2/2015 12:42:08 AM	20005
Surr: 4-Bromofluorobenzene	91.5	80-120		%REC	1	7/2/2015 12:42:08 AM	20005

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 Not In Range
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#: 1506D27

06-Jul-15

**Client:** Western Refining Southwest, Inc.

**Project:** Bisti Landfarm Vadose Zone

Sample ID	<b>MB-19990</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 8015M/D: Diesel Range Organics</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>19990</b>	RunNo:	<b>27182</b>					
Prep Date:	<b>6/29/2015</b>	Analysis Date:	<b>7/1/2015</b>	SeqNo:	<b>815505</b>	Units:	<b>%REC</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	8.7		10.00		87.1	57.9	140			

Sample ID	<b>MB-20026</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 8015M/D: Diesel Range Organics</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>20026</b>	RunNo:	<b>27182</b>					
Prep Date:	<b>6/30/2015</b>	Analysis Date:	<b>7/1/2015</b>	SeqNo:	<b>816316</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	8.8		10.00		88.3	57.9	140			

Sample ID	<b>LCS-20026</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 8015M/D: Diesel Range Organics</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>20026</b>	RunNo:	<b>27182</b>					
Prep Date:	<b>6/30/2015</b>	Analysis Date:	<b>7/1/2015</b>	SeqNo:	<b>816317</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	41	10	50.00	0	82.6	57.4	139			
Surr: DNOP	4.9		5.000		97.5	57.9	140			

Sample ID	<b>MB-20028</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 8015M/D: Diesel Range Organics</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>20028</b>	RunNo:	<b>27182</b>					
Prep Date:	<b>6/30/2015</b>	Analysis Date:	<b>7/2/2015</b>	SeqNo:	<b>816327</b>	Units:	<b>%REC</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	10		10.00		101	57.9	140			

Sample ID	<b>LCS-20028</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 8015M/D: Diesel Range Organics</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>20028</b>	RunNo:	<b>27182</b>					
Prep Date:	<b>6/30/2015</b>	Analysis Date:	<b>7/2/2015</b>	SeqNo:	<b>816328</b>	Units:	<b>%REC</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	6.1		5.000		121	57.9	140			

**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 Not In Range
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1506D27  
06-Jul-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm Vadose Zone

Sample ID	<b>MB-20005</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 8015D: Gasoline Range</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>20005</b>	RunNo:	<b>27195</b>					
Prep Date:	<b>6/29/2015</b>	Analysis Date:	<b>6/30/2015</b>	SeqNo:	<b>814609</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	870		1000		87.1	75.4	113			

Sample ID	<b>LCS-20005</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 8015D: Gasoline Range</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>20005</b>	RunNo:	<b>27195</b>					
Prep Date:	<b>6/29/2015</b>	Analysis Date:	<b>6/30/2015</b>	SeqNo:	<b>814610</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	25.00	0	100	64	130			
Surr: BFB	920		1000		91.5	75.4	113			

**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 Not In Range
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1506D27  
06-Jul-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm Vadose Zone

Sample ID	<b>MB-20005</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 8021B: Volatiles</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>20005</b>	RunNo:	<b>27195</b>					
Prep Date:	<b>6/29/2015</b>	Analysis Date:	<b>6/30/2015</b>	SeqNo:	<b>814628</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.050								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.91		1.000		91.0	80	120			

Sample ID	<b>LCS-20005</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 8021B: Volatiles</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>20005</b>	RunNo:	<b>27195</b>					
Prep Date:	<b>6/29/2015</b>	Analysis Date:	<b>6/30/2015</b>	SeqNo:	<b>814629</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.99	0.050	1.000	0	99.3	76.6	128			
Toluene	0.98	0.050	1.000	0	98.1	75	124			
Ethylbenzene	1.0	0.050	1.000	0	102	79.5	126			
Xylenes, Total	3.0	0.10	3.000	0	101	78.8	124			
Surr: 4-Bromofluorobenzene	0.95		1.000		95.2	80	120			

### 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 Not In Range                             |
| R RPD outside accepted recovery limits            | RL Reporting Detection Limit                         |
| S Spike Recovery outside accepted recovery limits |  |



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: **Western Refining Southw**

Work Order Number: **1506D27**

RcptNo: **1**

Received by/date:

*[Signature]*

*06/27/15*

Logged By: **Lindsay Mangin**

**6/27/2015 8:45:00 AM**

*[Signature]*

Completed By: **Lindsay Mangin**

**6/27/2015 9:00:50 AM**

*[Signature]*

Reviewed By:

*[Signature]*

*06/29/15*

**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:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:			
Client Instructions:			

17. Additional remarks:

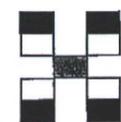
**18. Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	5.5	Good	Yes			

### Chain-of-Custody Record

Client: Western Refining  
Kelly Robinson  
 Mailing Address: 111 CR 4990 Bloomfield, NM  
 Phone #: 505-632-8013  
 Email or Fax#: Kelly.robinson@wnr.com  
 QA/QC Package:  
 Standard  Level 4 (Full Validation)  
 Accreditation  
 NELAP  Other \_\_\_\_\_  
 EDD (Type) \_\_\_\_\_

Turn-Around Time:  
 Standard  Rush  
 Project Name:  
Bisti Landfarm Vadose Zone  
 Project #:  
12610957  
 Project Manager:  
Brooke Herb  
 Sampler: Alex Crooks  
 On Ice:  Yes  No  
 Sample Temperature: 5.3



### 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 (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015 (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F, Cl, NO <sub>3</sub> , NO <sub>2</sub> , PO <sub>4</sub> , SO <sub>4</sub> )	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Air Bubbles (Y or N)	
4/20/15	1210	Soil	Westline Vadose Zone	4oz/2	COOL	1506027 -001	X		X										
	1230		Eastline Vadose Zone			-002													
	1140		Bisti Vadose Zone			-003													
	1135		Pettigrew Vadose Zone			-004													
	1125	✓	API Vadose Zone	✓	✓	-005	✓		✓										

Date: 4/20/15 Time: 1415 Relinquished by: Alex Crooks Received by: Christina Wertz Date: 4/20/15 Time: 1405 Remarks: Please USE Method 8015 M.  
 Date: 4/15 Time: 1747 Relinquished by: Christina Wertz Received by: [Signature] Date: 04/29/15 Time: 0845 Remarks: Please CC results to bherb@henu.com

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  
4901 Hawkins NE  
Albuquerque, NM 87109  
TEL: 505-345-3975 FAX: 505-345-4107  
Website: [www.hallenvironmental.com](http://www.hallenvironmental.com)

September 10, 2015

Brook Herb

Western Refining Southwest, Inc.

#50 CR 4990

Bloomfield, NM 87413

TEL: (505) 632-4135

FAX

RE: Bisti Landfarm

OrderNo.: 1509094

Dear Brook Herb:

Hall Environmental Analysis Laboratory received 2 sample(s) on 9/2/2015 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](http://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 qualifiers 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,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a horizontal line.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

**Hall Environmental Analysis Laboratory, Inc.**

**Analytical Report**  
 Lab Order **1509094**  
 Date Reported: **9/10/2015**

**CLIENT:** Western Refining Southwest, Inc. **Client Sample ID:** Crude Cell Treatment Zone  
**Project:** Bisti Landfarm **Collection Date:** 9/1/2015 9:50:00 AM  
**Lab ID:** 1509094-001 **Matrix:** SOIL **Received Date:** 9/2/2015 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 418.1: TPH</b>							Analyst: <b>TOM</b>
Petroleum Hydrocarbons, TR	93	19		mg/Kg	1	9/8/2015	21151
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>LGT</b>
Chloride	72	30		mg/Kg	20	9/4/2015 3:04:20 PM	21158
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>JME</b>
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	9/4/2015 6:39:33 PM	21121
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/4/2015 6:39:33 PM	21121
Surr: DNOP	104	57.9-140		%REC	1	9/4/2015 6:39:33 PM	21121
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>RAA</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/3/2015 4:15:53 PM	21112
Surr: BFB	90.2	75.4-113		%REC	1	9/3/2015 4:15:53 PM	21112

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix		

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1509094

Date Reported: 9/10/2015

**CLIENT:** Western Refining Southwest, Inc.

**Client Sample ID:** API Cell Treatment Zone

**Project:** Bisti Landfarm

**Collection Date:** 9/1/2015 11:15:00 AM

**Lab ID:** 1509094-002

**Matrix:** SOIL

**Received Date:** 9/2/2015 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 418.1: TPH</b> Analyst: <b>TOM</b>							
Petroleum Hydrocarbons, TR	ND	20		mg/Kg	1	9/8/2015	21151
<b>EPA METHOD 300.0: ANIONS</b> Analyst: <b>LGT</b>							
Chloride	190	30		mg/Kg	20	9/4/2015 3:16:44 PM	21158
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b> Analyst: <b>JME</b>							
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/4/2015 7:00:58 PM	21121
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/4/2015 7:00:58 PM	21121
Surr: DNOP	107	57.9-140		%REC	1	9/4/2015 7:00:58 PM	21121
<b>EPA METHOD 8015D: GASOLINE RANGE</b> Analyst: <b>RAA</b>							
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/3/2015 4:41:13 PM	21112
Surr: BFB	92.0	75.4-113		%REC	1	9/3/2015 4:41:13 PM	21112

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
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix		

**QC SUMMARY REPORT**  
**Hall Environmental Analysis Laboratory, Inc.**

WO#: 1509094  
 10-Sep-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm

Sample ID <b>MB-21158</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>PBS</b>	Batch ID: <b>21158</b>	RunNo: <b>28681</b>								
Prep Date: <b>9/4/2015</b>	Analysis Date: <b>9/4/2015</b>	SeqNo: <b>868771</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID <b>LCS-21158</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>21158</b>	RunNo: <b>28681</b>								
Prep Date: <b>9/4/2015</b>	Analysis Date: <b>9/4/2015</b>	SeqNo: <b>868772</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.8	90	110			

**Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1509094

10-Sep-15

**Client:** Western Refining Southwest, Inc.

**Project:** Bisti Landfarm

Sample ID	<b>MB-21151</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 418.1: TPH</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>21151</b>	RunNo:	<b>28697</b>					
Prep Date:	<b>9/4/2015</b>	Analysis Date:	<b>9/8/2015</b>	SeqNo:	<b>869534</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	ND	20								

Sample ID	<b>LCS-21151</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 418.1: TPH</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>21151</b>	RunNo:	<b>28697</b>					
Prep Date:	<b>9/4/2015</b>	Analysis Date:	<b>9/8/2015</b>	SeqNo:	<b>869535</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	110	20	100.0	0	110	83.6	116			

Sample ID	<b>LCSD-21151</b>	SampType:	<b>LCSD</b>	TestCode:	<b>EPA Method 418.1: TPH</b>					
Client ID:	<b>LCSS02</b>	Batch ID:	<b>21151</b>	RunNo:	<b>28697</b>					
Prep Date:	<b>9/4/2015</b>	Analysis Date:	<b>9/8/2015</b>	SeqNo:	<b>869536</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	110	20	100.0	0	113	83.6	116	2.49	20	

**Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit

# QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1509094

10-Sep-15

**Client:** Western Refining Southwest, Inc.

**Project:** Bisti Landfarm

Sample ID	<b>MB-21121</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 8015M/D: Diesel Range Organics</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>21121</b>	RunNo:	<b>28657</b>					
Prep Date:	<b>9/3/2015</b>	Analysis Date:	<b>9/4/2015</b>	SeqNo:	<b>868052</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	11		10.00		105	57.9	140			

Sample ID	<b>LCS-21121</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 8015M/D: Diesel Range Organics</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>21121</b>	RunNo:	<b>28657</b>					
Prep Date:	<b>9/3/2015</b>	Analysis Date:	<b>9/4/2015</b>	SeqNo:	<b>868053</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	42	10	50.00	0	84.9	57.4	139			
Surr: DNOP	5.0		5.000		99.7	57.9	140			

**Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit

**QC SUMMARY REPORT**  
**Hall Environmental Analysis Laboratory, Inc.**

WO#: 1509094  
 10-Sep-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm

Sample ID	<b>LCS-21112</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 8015D: Gasoline Range</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>21112</b>	RunNo:	<b>28662</b>					
Prep Date:	<b>9/2/2015</b>	Analysis Date:	<b>9/3/2015</b>	SeqNo:	<b>868074</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	5.0	25.00	0	107	79.6	122			
Surr: BFB	1000		1000		99.7	75.4	113			

Sample ID	<b>MB-21112</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 8015D: Gasoline Range</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>21112</b>	RunNo:	<b>28662</b>					
Prep Date:	<b>9/2/2015</b>	Analysis Date:	<b>9/3/2015</b>	SeqNo:	<b>868075</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	890		1000		88.7	75.4	113			

**Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit



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: **Western Refining Southw**      Work Order Number: **1509094**      RcptNo: **1**

Received by/date: *[Signature]* **09/02/15**  
 Logged By: **Lindsay Mangin** **9/2/2015 8:00:00 AM** *[Signature]*  
 Completed By: **Lindsay Mangin** **9/2/2015 10:17:26 AM** *[Signature]*  
 Reviewed By: *[Signature]* **09/02/15**

**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	1.4	Good	Yes			





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

September 11, 2015

Brooke Herb  
Western Refining Southwest, Inc.  
#50 CR 4990  
Bloomfield, NM 87413  
TEL: (505) 632-4135  
FAX

RE: Bisti Landfarm

OrderNo.: 1509095

Dear Brooke Herb:

Hall Environmental Analysis Laboratory received 5 sample(s) on 9/2/2015 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](http://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 qualifiers 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,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a white background.

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109

Analytical Report

Lab Order 1509095

Date Reported: 9/11/2015

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: Westline Vadose Zone

Project: Bisti Landfarm

Collection Date: 9/1/2015 10:00:00 AM

Lab ID: 1509095-001

Matrix: SOIL

Received Date: 9/2/2015 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 418.1: TPH</b>							Analyst: <b>TOM</b>
Petroleum Hydrocarbons, TR	ND	19		mg/Kg	1	9/8/2015	21151
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>LGT</b>
Chloride	ND	30		mg/Kg	20	9/4/2015 3:29:08 PM	21158
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>JME</b>
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/4/2015 7:22:29 PM	21121
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/4/2015 7:22:29 PM	21121
Surr: DNOP	98.4	57.9-140		%REC	1	9/4/2015 7:22:29 PM	21121
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>RAA</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/3/2015 5:06:26 PM	21112
Surr: BFB	90.0	75.4-113		%REC	1	9/3/2015 5:06:26 PM	21112
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>RAA</b>
Benzene	ND	0.048		mg/Kg	1	9/3/2015 5:06:26 PM	21112
Toluene	ND	0.048		mg/Kg	1	9/3/2015 5:06:26 PM	21112
Ethylbenzene	ND	0.048		mg/Kg	1	9/3/2015 5:06:26 PM	21112
Xylenes, Total	ND	0.095		mg/Kg	1	9/3/2015 5:06:26 PM	21112
Surr: 4-Bromofluorobenzene	103	80-120		%REC	1	9/3/2015 5:06:26 PM	21112

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix		

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1509095

Date Reported: 9/11/2015

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: Eastline Vadose Zone

Project: Bisti Landfarm

Collection Date: 9/1/2015 10:15:00 AM

Lab ID: 1509095-002

Matrix: SOIL

Received Date: 9/2/2015 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 418.1: TPH</b> Analyst: <b>TOM</b>							
Petroleum Hydrocarbons, TR	ND	20		mg/Kg	1	9/8/2015	21151
<b>EPA METHOD 300.0: ANIONS</b> Analyst: <b>LGT</b>							
Chloride	ND	30		mg/Kg	20	9/4/2015 4:06:22 PM	21158
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b> Analyst: <b>JME</b>							
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	9/4/2015 7:43:56 PM	21121
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/4/2015 7:43:56 PM	21121
Surr: DNOP	105	57.9-140		%REC	1	9/4/2015 7:43:56 PM	21121
<b>EPA METHOD 8015D: GASOLINE RANGE</b> Analyst: <b>RAA</b>							
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/3/2015 5:31:41 PM	21112
Surr: BFB	89.4	75.4-113		%REC	1	9/3/2015 5:31:41 PM	21112
<b>EPA METHOD 8021B: VOLATILES</b> Analyst: <b>RAA</b>							
Benzene	ND	0.048		mg/Kg	1	9/3/2015 5:31:41 PM	21112
Toluene	ND	0.048		mg/Kg	1	9/3/2015 5:31:41 PM	21112
Ethylbenzene	ND	0.048		mg/Kg	1	9/3/2015 5:31:41 PM	21112
Xylenes, Total	ND	0.095		mg/Kg	1	9/3/2015 5:31:41 PM	21112
Surr: 4-Bromofluorobenzene	103	80-120		%REC	1	9/3/2015 5:31:41 PM	21112

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
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix		

**Hall Environmental Analysis Laboratory, Inc.**

**Analytical Report**  
 Lab Order 1509095  
 Date Reported: 9/11/2015

**CLIENT:** Western Refining Southwest, Inc. **Client Sample ID:** Bisti Vadose Zone  
**Project:** Bisti Landfarm **Collection Date:** 9/1/2015 10:05:00 AM  
**Lab ID:** 1509095-003 **Matrix:** SOIL **Received Date:** 9/2/2015 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 418.1: TPH</b> Analyst: <b>TOM</b>							
Petroleum Hydrocarbons, TR	ND	20		mg/Kg	1	9/8/2015	21151
<b>EPA METHOD 300.0: ANIONS</b> Analyst: <b>LGT</b>							
Chloride	ND	30		mg/Kg	20	9/4/2015 4:18:47 PM	21158
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b> Analyst: <b>JME</b>							
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/4/2015 8:05:25 PM	21121
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/4/2015 8:05:25 PM	21121
Surr: DNOP	104	57.9-140		%REC	1	9/4/2015 8:05:25 PM	21121
<b>EPA METHOD 8015D: GASOLINE RANGE</b> Analyst: <b>RAA</b>							
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/3/2015 5:56:57 PM	21112
Surr: BFB	89.9	75.4-113		%REC	1	9/3/2015 5:56:57 PM	21112
<b>EPA METHOD 8021B: VOLATILES</b> Analyst: <b>RAA</b>							
Benzene	ND	0.048		mg/Kg	1	9/3/2015 5:56:57 PM	21112
Toluene	ND	0.048		mg/Kg	1	9/3/2015 5:56:57 PM	21112
Ethylbenzene	ND	0.048		mg/Kg	1	9/3/2015 5:56:57 PM	21112
Xylenes, Total	ND	0.095		mg/Kg	1	9/3/2015 5:56:57 PM	21112
Surr: 4-Bromofluorobenzene	103	80-120		%REC	1	9/3/2015 5:56:57 PM	21112

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix		

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1509095

Date Reported: 9/11/2015

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: Pettigrew Vadose Zone

Project: Bisti Landfarm

Collection Date: 9/1/2015 11:25:00 AM

Lab ID: 1509095-004

Matrix: SOIL

Received Date: 9/2/2015 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 418.1: TPH</b> Analyst: TOM							
Petroleum Hydrocarbons, TR	ND	19		mg/Kg	1	9/8/2015	21151
<b>EPA METHOD 300.0: ANIONS</b> Analyst: LGT							
Chloride	3100	150		mg/Kg	100	9/8/2015 8:31:18 PM	21158
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b> Analyst: JME							
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	9/4/2015 8:26:49 PM	21121
Motor Oil Range Organics (MRO)	ND	51		mg/Kg	1	9/4/2015 8:26:49 PM	21121
Surr: DNOP	104	57.9-140		%REC	1	9/4/2015 8:26:49 PM	21121
<b>EPA METHOD 8015D: GASOLINE RANGE</b> Analyst: RAA							
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/3/2015 8:03:36 PM	21112
Surr: BFB	87.4	75.4-113		%REC	1	9/3/2015 8:03:36 PM	21112
<b>EPA METHOD 8021B: VOLATILES</b> Analyst: RAA							
Benzene	ND	0.050		mg/Kg	1	9/3/2015 8:03:36 PM	21112
Toluene	ND	0.050		mg/Kg	1	9/3/2015 8:03:36 PM	21112
Ethylbenzene	ND	0.050		mg/Kg	1	9/3/2015 8:03:36 PM	21112
Xylenes, Total	ND	0.099		mg/Kg	1	9/3/2015 8:03:36 PM	21112
Surr: 4-Bromofluorobenzene	100	80-120		%REC	1	9/3/2015 8:03:36 PM	21112

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
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix		

# Hall Environmental Analysis Laboratory, Inc.

## Analytical Report

Lab Order 1509095

Date Reported: 9/11/2015

**CLIENT:** Western Refining Southwest, Inc.

**Client Sample ID:** API Vadose Zone

**Project:** Bisti Landfarm

**Collection Date:** 9/1/2015 11:20:00 AM

**Lab ID:** 1509095-005

**Matrix:** SOIL

**Received Date:** 9/2/2015 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 418.1: TPH</b>							Analyst: <b>TOM</b>
Petroleum Hydrocarbons, TR	ND	19		mg/Kg	1	9/8/2015	21151
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>LGT</b>
Chloride	38	30		mg/Kg	20	9/4/2015 4:43:36 PM	21158
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>JME</b>
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	9/4/2015 8:48:33 PM	21121
Motor Oil Range Organics (MRO)	ND	51		mg/Kg	1	9/4/2015 8:48:33 PM	21121
Surr: DNOP	126	57.9-140		%REC	1	9/4/2015 8:48:33 PM	21121
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>RAA</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/3/2015 8:28:56 PM	21112
Surr: BFB	88.0	75.4-113		%REC	1	9/3/2015 8:28:56 PM	21112
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>RAA</b>
Benzene	ND	0.048		mg/Kg	1	9/3/2015 8:28:56 PM	21112
Toluene	ND	0.048		mg/Kg	1	9/3/2015 8:28:56 PM	21112
Ethylbenzene	ND	0.048		mg/Kg	1	9/3/2015 8:28:56 PM	21112
Xylenes, Total	ND	0.096		mg/Kg	1	9/3/2015 8:28:56 PM	21112
Surr: 4-Bromofluorobenzene	102	80-120		%REC	1	9/3/2015 8:28:56 PM	21112

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
D	Sample Diluted Due to Matrix	E Value above quantitation range
H	Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P Sample pH Not In Range
R	RPD outside accepted recovery limits	RL Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	

# QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1509095

11-Sep-15

Client: Western Refining Southwest, Inc.

Project: Bisti Landfarm

Sample ID	<b>MB-21158</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 300.0: Anions</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>21158</b>	RunNo:	<b>28681</b>					
Prep Date:	<b>9/4/2015</b>	Analysis Date:	<b>9/4/2015</b>	SeqNo:	<b>868771</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	<b>LCS-21158</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 300.0: Anions</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>21158</b>	RunNo:	<b>28681</b>					
Prep Date:	<b>9/4/2015</b>	Analysis Date:	<b>9/4/2015</b>	SeqNo:	<b>868772</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.8	90	110			

### Qualifiers:

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1509095  
11-Sep-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm

Sample ID	<b>MB-21151</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 418.1: TPH</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>21151</b>	RunNo:	<b>28697</b>					
Prep Date:	<b>9/4/2015</b>	Analysis Date:	<b>9/8/2015</b>	SeqNo:	<b>869534</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	ND	20								

Sample ID	<b>LCS-21151</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 418.1: TPH</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>21151</b>	RunNo:	<b>28697</b>					
Prep Date:	<b>9/4/2015</b>	Analysis Date:	<b>9/8/2015</b>	SeqNo:	<b>869535</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	110	20	100.0	0	110	83.6	116			

Sample ID	<b>LCSD-21151</b>	SampType:	<b>LCSD</b>	TestCode:	<b>EPA Method 418.1: TPH</b>					
Client ID:	<b>LCSS02</b>	Batch ID:	<b>21151</b>	RunNo:	<b>28697</b>					
Prep Date:	<b>9/4/2015</b>	Analysis Date:	<b>9/8/2015</b>	SeqNo:	<b>869536</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	110	20	100.0	0	113	83.6	116	2.49	20	

**Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1509095  
11-Sep-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm

Sample ID: <b>MB-21121</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>PBS</b>	Batch ID: <b>21121</b>	RunNo: <b>28657</b>								
Prep Date: <b>9/3/2015</b>	Analysis Date: <b>9/4/2015</b>	SeqNo: <b>868052</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	11		10.00		105	57.9	140			

Sample ID: <b>LCS-21121</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>21121</b>	RunNo: <b>28657</b>								
Prep Date: <b>9/3/2015</b>	Analysis Date: <b>9/4/2015</b>	SeqNo: <b>868053</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	42	10	50.00	0	84.9	57.4	139			
Surr: DNOP	5.0		5.000		99.7	57.9	140			

**Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit

**QC SUMMARY REPORT**  
**Hall Environmental Analysis Laboratory, Inc.**

WO#: 1509095  
 11-Sep-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm

Sample ID	<b>LCS-21112</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 8015D: Gasoline Range</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>21112</b>	RunNo:	<b>28662</b>					
Prep Date:	<b>9/2/2015</b>	Analysis Date:	<b>9/3/2015</b>	SeqNo:	<b>868074</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	5.0	25.00	0	107	79.6	122			
Surr: BFB	1000		1000		99.7	75.4	113			

Sample ID	<b>MB-21112</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 8015D: Gasoline Range</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>21112</b>	RunNo:	<b>28662</b>					
Prep Date:	<b>9/2/2015</b>	Analysis Date:	<b>9/3/2015</b>	SeqNo:	<b>868075</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	890		1000		88.7	75.4	113			

**Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit

**QC SUMMARY REPORT**  
**Hall Environmental Analysis Laboratory, Inc.**

WO#: 1509095  
 11-Sep-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm

Sample ID	LCS-21112		SampType:	LCS		TestCode:	EPA Method 8021B: Volatiles				
Client ID:	LCSS		Batch ID:	21112		RunNo:	28662				
Prep Date:	9/2/2015		Analysis Date:	9/3/2015		SeqNo:	868094		Units: mg/Kg		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Benzene	0.91	0.050	1.000	0	90.7	80	120				
Toluene	0.89	0.050	1.000	0	89.5	80	120				
Ethylbenzene	0.90	0.050	1.000	0	90.2	80	120				
Xylenes, Total	2.7	0.10	3.000	0	90.4	80	120				
Surr: 4-Bromofluorobenzene	1.1		1.000		112	80	120				

Sample ID	MB-21112		SampType:	MBLK		TestCode:	EPA Method 8021B: Volatiles				
Client ID:	PBS		Batch ID:	21112		RunNo:	28662				
Prep Date:	9/2/2015		Analysis Date:	9/3/2015		SeqNo:	868095		Units: mg/Kg		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Benzene	ND	0.050									
Toluene	ND	0.050									
Ethylbenzene	ND	0.050									
Xylenes, Total	ND	0.10									
Surr: 4-Bromofluorobenzene	1.0		1.000		105	80	120				

**Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit



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: **Western Refining Southw**

Work Order Number: **1509095**

RcptNo: **1**

Received by/date:

Logged By: **Lindsay Mangin**

*09/02/15*  
**9/2/2015 8:00:00 AM**

Completed By: **Lindsay Mangin**

**9/2/2015 10:22:10 AM**

Reviewed By:

*09/02/15*

*[Signature]*  
*[Signature]*

### 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? Yes  No
- (Note discrepancies on chain of custody)
- 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? Yes  No
- (If no, notify customer for authorization.)

# 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	1.4	Good	Yes			

# Chain-of-Custody Record

Client: Kelly Robinson  
Western Refining  
 Mailing Address: 111 CR 4990  
Bloomfield, NM  
 Phone #: (505) 632-8013  
 email or Fax#: Kelly.Robinson@WNR.com  
 QA/QC Package:  
 Standard  Level 4 (Full Validation)  
 Accreditation  
 NELAP  Other \_\_\_\_\_  
 EDD (Type) \_\_\_\_\_

Turn-Around Time:  
 Standard  Rush  
 Project Name:  
Bisti LandFarm  
 Project #:  
WR1005  
 Project Manager:  
Brooke Herb  
 Sampler: Alex Crooks / Michael Wicker  
 On Ice:  Yes  No  
 Sample Temperature: 1.4



## 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 + TPH (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F, Cl, NO <sub>3</sub> , NO <sub>2</sub> , PO <sub>4</sub> , SO <sub>4</sub> )	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	GRO/DRO combined fractions	Chlorides (300.0)	Air Bubbles (Y or N)	
-1-15	1000	Soil	Westline Vadose Zone	2 Sars	Cool	1509095 -001	X			X									X	X	
-1-15	1015	Soil	Eastline Vadose Zone	2 Sars	Cool	-002	X			X									X	X	
-1-15	1005	Soil	Bisti Vadose Zone	2 Sars	Cool	-003	X			X									X	X	
-1-15	1125	Soil	Pettigreen Vadose Zone	2 Sars	Cool	-004	X			X									X	X	
-1-15	1120	Soil	API Vadose Zone	2 Sars	Cool	-005	X			X									X	X	

Date: -1-15 Time: 1227 Relinquished by: [Signature]  
 Received by: Christ Walt Date: 9/1/15 Time: 1227  
 Date: 9/1/15 Time: 1805 Relinquished by: Christine Walker  
 Received by: [Signature] Date: 09/02/15 Time: 0800

Remarks: CC: BHerb@LTEVI.COM  
AAger@LTEVI.COM  
MWicker@LTEVI.COM  
DO# 12610957

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  
4901 Hawkins NE  
Albuquerque, NM 87109  
TEL: 505-345-3975 FAX: 505-345-4107  
Website: [www.hallenvironmental.com](http://www.hallenvironmental.com)

October 05, 2015

Brook Herb  
Western Refining Southwest, Inc.  
#50 CR 4990  
Bloomfield, NM 87413  
TEL: (505) 632-4135  
FAX

RE: Bisti Landfarm

OrderNo.: 1509090

Dear Brook Herb:

Hall Environmental Analysis Laboratory received 1 sample(s) on 9/2/2015 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](http://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 qualifiers 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,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a light blue horizontal line.

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109

Analytical Report

Lab Order 1509090

Date Reported: 10/5/2015

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: Background

Project: Bisti Landfarm

Collection Date: 9/1/2015 10:50:00 AM

Lab ID: 1509090-001

Matrix: SOIL

Received Date: 9/2/2015 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 418.1: TPH</b> Analyst: TOM							
Petroleum Hydrocarbons, TR	ND	20		mg/Kg	1	9/8/2015	21151
<b>EPA METHOD 300.0: ANIONS</b> Analyst: LGT							
Fluoride	0.84	0.30		mg/Kg	1	9/8/2015 3:21:01 PM	21182
Nitrogen, Nitrate (As N)	ND	0.30		mg/Kg	1	9/8/2015 3:21:01 PM	21182
<b>EPA METHOD 6010B: SOIL METALS</b> Analyst: JLF							
Copper	3.2	0.30		mg/Kg	1	9/10/2015 10:39:20 AM	21211
Iron	7200	120		mg/Kg	50	9/10/2015 11:33:58 AM	21211
Manganese	150	0.099		mg/Kg	1	9/10/2015 10:39:20 AM	21211
Uranium	ND	4.9		mg/Kg	1	9/10/2015 10:39:20 AM	21211
Zinc	14	2.5		mg/Kg	1	9/10/2015 10:39:20 AM	21211
<b>EPA METHOD 8082: PCB'S</b> Analyst: SCC							
Aroclor 1016	ND	0.020		mg/Kg	1	9/8/2015 2:12:46 PM	21124
Aroclor 1221	ND	0.020		mg/Kg	1	9/8/2015 2:12:46 PM	21124
Aroclor 1232	ND	0.020		mg/Kg	1	9/8/2015 2:12:46 PM	21124
Aroclor 1242	ND	0.020		mg/Kg	1	9/8/2015 2:12:46 PM	21124
Aroclor 1248	ND	0.020		mg/Kg	1	9/8/2015 2:12:46 PM	21124
Aroclor 1254	ND	0.020		mg/Kg	1	9/8/2015 2:12:46 PM	21124
Aroclor 1260	ND	0.020		mg/Kg	1	9/8/2015 2:12:46 PM	21124
Surr: Decachlorobiphenyl	87.6	25.2-134		%REC	1	9/8/2015 2:12:46 PM	21124
Surr: Tetrachloro-m-xylene	72.8	17.4-148		%REC	1	9/8/2015 2:12:46 PM	21124
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b> Analyst: JME							
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	9/4/2015 6:18:05 PM	21121
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/4/2015 6:18:05 PM	21121
Surr: DNOP	153	57.9-140	S	%REC	1	9/4/2015 6:18:05 PM	21121
<b>EPA METHOD 8015D: GASOLINE RANGE</b> Analyst: RAA							
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/3/2015 3:50:33 PM	21112
Surr: BFB	89.7	75.4-113		%REC	1	9/3/2015 3:50:33 PM	21112
<b>EPA METHOD 8310: PAHS</b> Analyst: SCC							
Naphthalene	ND	0.25		mg/Kg	1	9/8/2015 2:13:15 PM	21125
1-Methylnaphthalene	ND	0.25		mg/Kg	1	9/8/2015 2:13:15 PM	21125
2-Methylnaphthalene	ND	0.25		mg/Kg	1	9/8/2015 2:13:15 PM	21125
Benzo(a)pyrene	ND	0.0099		mg/Kg	1	9/8/2015 2:13:15 PM	21125
<b>EPA METHOD 8260B: VOLATILES</b> Analyst: AG							
Benzene	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Toluene	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Ethylbenzene	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	

Analytical Report

Lab Order 1509090

Date Reported: 10/5/2015

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: Background

Project: Bisti Landfarm

Collection Date: 9/1/2015 10:50:00 AM

Lab ID: 1509090-001

Matrix: SOIL

Received Date: 9/2/2015 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260B: VOLATILES</b>							Analyst: AG
Methyl tert-butyl ether (MTBE)	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
1,2,4-Trimethylbenzene	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
1,3,5-Trimethylbenzene	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
1,2-Dichloroethane (EDC)	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
1,2-Dibromoethane (EDB)	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Naphthalene	ND	0.095		mg/Kg	1	9/3/2015 4:53:30 PM	21112
1-Methylnaphthalene	ND	0.19		mg/Kg	1	9/3/2015 4:53:30 PM	21112
2-Methylnaphthalene	ND	0.19		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Acetone	ND	0.72		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Bromobenzene	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Bromodichloromethane	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Bromoform	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Bromomethane	ND	0.14		mg/Kg	1	9/3/2015 4:53:30 PM	21112
2-Butanone	ND	0.48		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Carbon disulfide	ND	0.48		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Carbon tetrachloride	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Chlorobenzene	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Chloroethane	ND	0.095		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Chloroform	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Chloromethane	ND	0.14		mg/Kg	1	9/3/2015 4:53:30 PM	21112
2-Chlorotoluene	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
4-Chlorotoluene	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
cis-1,2-DCE	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
cis-1,3-Dichloropropene	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
1,2-Dibromo-3-chloropropane	ND	0.095		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Dibromochloromethane	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Dibromomethane	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
1,2-Dichlorobenzene	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
1,3-Dichlorobenzene	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
1,4-Dichlorobenzene	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Dichlorodifluoromethane	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
1,1-Dichloroethane	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
1,1-Dichloroethene	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
1,2-Dichloropropane	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
1,3-Dichloropropane	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
2,2-Dichloropropane	ND	0.095		mg/Kg	1	9/3/2015 4:53:30 PM	21112
1,1-Dichloropropene	ND	0.095		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Hexachlorobutadiene	ND	0.095		mg/Kg	1	9/3/2015 4:53:30 PM	21112
2-Hexanone	ND	0.48		mg/Kg	1	9/3/2015 4:53:30 PM	21112

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
D	Sample Diluted Due to Matrix	E Value above quantitation range
H	Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P Sample pH Not In Range
R	RPD outside accepted recovery limits	RL Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1509090

Date Reported: 10/5/2015

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: Background

Project: Bisti Landfarm

Collection Date: 9/1/2015 10:50:00 AM

Lab ID: 1509090-001

Matrix: SOIL

Received Date: 9/2/2015 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260B: VOLATILES</b>							Analyst: <b>AG</b>
Isopropylbenzene	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
4-Isopropyltoluene	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
4-Methyl-2-pentanone	ND	0.48		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Methylene chloride	ND	0.14		mg/Kg	1	9/3/2015 4:53:30 PM	21112
n-Butylbenzene	ND	0.14		mg/Kg	1	9/3/2015 4:53:30 PM	21112
n-Propylbenzene	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
sec-Butylbenzene	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Styrene	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
tert-Butylbenzene	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
1,1,1,2-Tetrachloroethane	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
1,1,2,2-Tetrachloroethane	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Tetrachloroethene (PCE)	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
trans-1,2-DCE	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
trans-1,3-Dichloropropene	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
1,2,3-Trichlorobenzene	ND	0.095		mg/Kg	1	9/3/2015 4:53:30 PM	21112
1,2,4-Trichlorobenzene	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
1,1,1-Trichloroethane	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
1,1,2-Trichloroethane	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Trichloroethene (TCE)	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Trichlorofluoromethane	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
1,2,3-Trichloropropane	ND	0.095		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Vinyl chloride	ND	0.048		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Xylenes, Total	ND	0.095		mg/Kg	1	9/3/2015 4:53:30 PM	21112
Surr: Dibromofluoromethane	98.5	70-130		%REC	1	9/3/2015 4:53:30 PM	21112
Surr: 1,2-Dichloroethane-d4	96.8	70-130		%REC	1	9/3/2015 4:53:30 PM	21112
Surr: Toluene-d8	89.0	70-130		%REC	1	9/3/2015 4:53:30 PM	21112
Surr: 4-Bromofluorobenzene	95.3	70-130		%REC	1	9/3/2015 4:53:30 PM	21112
<b>SM4500-H+B: PH</b>							Analyst: <b>JRR</b>
pH	7.89	1.68		pH Units	1	9/3/2015 11:45:00 AM	R28642

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	

Collected date/time: 09/01/15 10:50

L787017

Wet Chemistry by Method 9012B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Cyanide	ND		0.250	1	09/09/2015 12:47	WG814063

Wet Chemistry by Method 9066

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Total Phenol by 4AAP	ND		0.670	1	09/14/2015 14:05	WG814790

- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

Method Blank (MB)

{MB} 09/09/15 12:26

Analyte	MB Result	MB Qualifier	MB RDL
Cyanide	mg/kg		mg/kg
Cyanide	ND		0.250

L787320-02 Original Sample (OS) • Duplicate (DUP)

{OS} 09/09/15 12:35 - {DUP} 09/09/15 12:36

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Cyanide	mg/kg	mg/kg		%		%
Cyanide	ND	ND	1	0.00		20

L787320-01 Original Sample (OS) • Duplicate (DUP)

{OS} 09/09/15 12:53 - {DUP} 09/09/15 12:54

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Cyanide	mg/kg	mg/kg		%		%
Cyanide	ND	ND	1	200	P1	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

{LCS} 09/09/15 12:28 - {LCSD} 09/09/15 12:29

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Cyanide	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Cyanide	53.9	47.0	51.0	87.2	94.6	50.0-150			8.16	20

2 Tc  
3 Ss  
4 Cn  
5 Sr  
6 Qc  
7 Gl  
8 Al  
9 Sc



Method Blank (MB)

(MB) 09/14/15 14:00

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Total Phenol by 4AAP	ND		0.670

L786552-01 Original Sample (OS) - Duplicate (DUP)

(OS) 09/14/15 14:04 - (DUP) 09/14/15 14:04

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Phenol by 4AAP	ND	ND	1	0.00		20

Laboratory Control Sample (LCS) - Laboratory Control Sample Duplicate (LCSD)

(LCS) 09/14/15 14:01 - (LCSD) 09/14/15 14:02

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Total Phenol by 4AAP	8.33	8.77	8.88	105	107	90.0-110			1.25	20

L787017-01 Original Sample (OS) - Matrix Spike (MS) - Matrix Spike Duplicate (MSD)

(OS) 09/14/15 14:05 - (MS) 09/14/15 14:06 - (MSD) 09/14/15 14:07

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Total Phenol by 4AAP	16.7	0.120	15.8	15.8	94.6	94.6	1	90.0-110			0.000	20

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc



Pace Analytical Services, Inc.  
1638 Roseytown Road - Suites 2,3,4  
Greensburg, PA 15601  
(724)850-5600

### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1509090  
Pace Project No.: 30158412

Sample: 1509090-001C Background Lab ID: 30158412001 Collected: 09/01/15 10:50 Received: 09/03/15 09:30 Matrix: Solid  
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	0.737 ± 0.242 (0.171) C:NA T:NA	pCi/g	10/02/15 11:57	13982-63-3	
Radium-228	EPA 901.1	0.806 ± 0.338 (0.462) C:NA T:NA	pCi/g	10/02/15 11:57	15262-20-1	

### REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.  
1638 Roseytown Road - Suites 2,3,4  
Greensburg, PA 15601  
(724)850-5600

### QUALITY CONTROL - RADIOCHEMISTRY

Project: 1509090  
Pace Project No.: 30158412

---

QC Batch: RADC/26047                      Analysis Method: EPA 901.1  
QC Batch Method: EPA 901.1              Analysis Description: 901.1 Gamma Spec Ingrowth  
Associated Lab Samples: 30158412001

---

METHOD BLANK: 952582                      Matrix: Solid  
Associated Lab Samples: 30158412001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.144 ± 0.175 (0.276) C:NA T:NA	pCi/g	09/16/15 21:55	
Radium-228	0.169 ± 0.213 (0.330) C:NA T:NA	pCi/g	09/16/15 21:55	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1509090

05-Oct-15

**Client:** Western Refining Southwest, Inc.

**Project:** Bisti Landfarm

Sample ID	<b>MB-21182</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 300.0: Anions</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>21182</b>	RunNo:	<b>28712</b>					
Prep Date:	<b>9/8/2015</b>	Analysis Date:	<b>9/8/2015</b>	SeqNo:	<b>870259</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.30								
Nitrogen, Nitrate (As N)	ND	0.30								

Sample ID	<b>LCS-21182</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 300.0: Anions</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>21182</b>	RunNo:	<b>28712</b>					
Prep Date:	<b>9/8/2015</b>	Analysis Date:	<b>9/8/2015</b>	SeqNo:	<b>870260</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	1.5	0.30	1.500	0	99.4	90	110			
Nitrogen, Nitrate (As N)	7.5	0.30	7.500	0	99.5	90	110			

Sample ID	<b>1509090-001AMS</b>	SampType:	<b>MS</b>	TestCode:	<b>EPA Method 300.0: Anions</b>					
Client ID:	<b>Background</b>	Batch ID:	<b>21182</b>	RunNo:	<b>28712</b>					
Prep Date:	<b>9/8/2015</b>	Analysis Date:	<b>9/8/2015</b>	SeqNo:	<b>870270</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	1.4	0.30	1.500	0.8431	34.8	13.6	100			
Nitrogen, Nitrate (As N)	7.6	0.30	7.500	0	101	87.6	109			

Sample ID	<b>1509090-001AMSD</b>	SampType:	<b>MSD</b>	TestCode:	<b>EPA Method 300.0: Anions</b>					
Client ID:	<b>Background</b>	Batch ID:	<b>21182</b>	RunNo:	<b>28712</b>					
Prep Date:	<b>9/8/2015</b>	Analysis Date:	<b>9/8/2015</b>	SeqNo:	<b>870271</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	1.4	0.30	1.500	0.8431	34.1	13.6	100	0.759	20	
Nitrogen, Nitrate (As N)	7.6	0.30	7.500	0	102	87.6	109	0.992	20	

**Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1509090

05-Oct-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm

Sample ID	<b>MB-21151</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 418.1: TPH</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>21151</b>	RunNo:	<b>28697</b>					
Prep Date:	<b>9/4/2015</b>	Analysis Date:	<b>9/8/2015</b>	SeqNo:	<b>869534</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	ND	20								

Sample ID	<b>LCS-21151</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 418.1: TPH</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>21151</b>	RunNo:	<b>28697</b>					
Prep Date:	<b>9/4/2015</b>	Analysis Date:	<b>9/8/2015</b>	SeqNo:	<b>869535</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	110	20	100.0	0	110	83.6	116			

Sample ID	<b>LCSD-21151</b>	SampType:	<b>LCSD</b>	TestCode:	<b>EPA Method 418.1: TPH</b>					
Client ID:	<b>LCSS02</b>	Batch ID:	<b>21151</b>	RunNo:	<b>28697</b>					
Prep Date:	<b>9/4/2015</b>	Analysis Date:	<b>9/8/2015</b>	SeqNo:	<b>869536</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Petroleum Hydrocarbons, TR	110	20	100.0	0	113	83.6	116	2.49	20	

**Qualifiers:**

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- D Sample Diluted Due to Matrix
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- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit

**QC SUMMARY REPORT**  
**Hall Environmental Analysis Laboratory, Inc.**

WO#: 1509090  
 05-Oct-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm

Sample ID: <b>MB-21121</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>PBS</b>	Batch ID: <b>21121</b>	RunNo: <b>28657</b>								
Prep Date: <b>9/3/2015</b>	Analysis Date: <b>9/4/2015</b>	SeqNo: <b>868052</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	11		10.00		105	57.9	140			

Sample ID: <b>LCS-21121</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>21121</b>	RunNo: <b>28657</b>								
Prep Date: <b>9/3/2015</b>	Analysis Date: <b>9/4/2015</b>	SeqNo: <b>868053</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	42	10	50.00	0	84.9	57.4	139			
Surr: DNOP	5.0		5.000		99.7	57.9	140			

**Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1509090  
05-Oct-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm

Sample ID	<b>LCS-21112</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 8015D: Gasoline Range</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>21112</b>	RunNo:	<b>28662</b>					
Prep Date:	<b>9/2/2015</b>	Analysis Date:	<b>9/3/2015</b>	SeqNo:	<b>868074</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	5.0	25.00	0	107	79.6	122			
Surr: BFB	1000		1000		99.7	75.4	113			

Sample ID	<b>MB-21112</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 8015D: Gasoline Range</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>21112</b>	RunNo:	<b>28662</b>					
Prep Date:	<b>9/2/2015</b>	Analysis Date:	<b>9/3/2015</b>	SeqNo:	<b>868075</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	890		1000		88.7	75.4	113			

**Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1509090  
05-Oct-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm

Sample ID	<b>MB-21124</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 8082: PCB's</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>21124</b>	RunNo:	<b>28678</b>					
Prep Date:	<b>9/3/2015</b>	Analysis Date:	<b>9/8/2015</b>	SeqNo:	<b>868658</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aroclor 1016	ND	0.020								
Aroclor 1221	ND	0.020								
Aroclor 1232	ND	0.020								
Aroclor 1242	ND	0.020								
Aroclor 1248	ND	0.020								
Aroclor 1254	ND	0.020								
Aroclor 1260	ND	0.020								
Surr: Decachlorobiphenyl	0.040		0.06250		63.6	25.2	134			
Surr: Tetrachloro-m-xylene	0.031		0.06250		50.0	17.4	148			

Sample ID	<b>LCS-21124</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 8082: PCB's</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>21124</b>	RunNo:	<b>28678</b>					
Prep Date:	<b>9/3/2015</b>	Analysis Date:	<b>9/8/2015</b>	SeqNo:	<b>868659</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aroclor 1016	0.070	0.020	0.1250	0	55.7	17.3	119			
Aroclor 1260	0.10	0.020	0.1250	0	80.5	10.7	139			
Surr: Decachlorobiphenyl	0.052		0.06250		82.8	25.2	134			
Surr: Tetrachloro-m-xylene	0.039		0.06250		62.0	17.4	148			

### Qualifiers:

- |   |   |
|---|---|
| * Value exceeds Maximum Contaminant Level.              | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix                          | E Value above quantitation range                  |
| H Holding times for preparation or analysis exceeded    | J Analyte detected below quantitation limits      |
| ND Not Detected at the Reporting Limit                  | P Sample pH Not In Range                          |
| R RPD outside accepted recovery limits                  | RL Reporting Detection Limit                      |
| S % Recovery outside of range due to dilution or matrix |   |

# QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1509090

05-Oct-15

**Client:** Western Refining Southwest, Inc.

**Project:** Bisti Landfarm

Sample ID	<b>ics-21112</b>		SampType: <b>LCS</b>	TestCode: <b>EPA Method 8260B: Volatiles</b>						
Client ID:	<b>LCSS</b>		Batch ID: <b>21112</b>	RunNo: <b>28652</b>						
Prep Date:	<b>9/2/2015</b>		Analysis Date: <b>9/3/2015</b>	SeqNo: <b>867326</b>	Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.96	0.050	1.000	0	96.4	70	130			
Toluene	0.88	0.050	1.000	0	88.4	70	130			
Chlorobenzene	0.98	0.050	1.000	0	98.1	70	130			
1,1-Dichloroethene	1.1	0.050	1.000	0	109	70	130			
Trichloroethene (TCE)	0.88	0.050	1.000	0	88.2	70	130			
Surr: Dibromofluoromethane	0.48		0.5000		96.9	70	130			
Surr: 1,2-Dichloroethane-d4	0.47		0.5000		94.3	70	130			
Surr: Toluene-d8	0.45		0.5000		89.3	70	130			
Surr: 4-Bromofluorobenzene	0.49		0.5000		98.4	70	130			

Sample ID	<b>mb-21112</b>		SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8260B: Volatiles</b>						
Client ID:	<b>PBS</b>		Batch ID: <b>21112</b>	RunNo: <b>28652</b>						
Prep Date:	<b>9/2/2015</b>		Analysis Date: <b>9/3/2015</b>	SeqNo: <b>867327</b>	Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.050								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Methyl tert-butyl ether (MTBE)	ND	0.050								
1,2,4-Trimethylbenzene	ND	0.050								
1,3,5-Trimethylbenzene	ND	0.050								
1,2-Dichloroethane (EDC)	ND	0.050								
1,2-Dibromoethane (EDB)	ND	0.050								
Naphthalene	ND	0.10								
1-Methylnaphthalene	ND	0.20								
2-Methylnaphthalene	ND	0.20								
Acetone	ND	0.75								
Bromobenzene	ND	0.050								
Bromodichloromethane	ND	0.050								
Bromofom	ND	0.050								
Bromomethane	ND	0.15								
2-Butanone	ND	0.50								
Carbon disulfide	ND	0.50								
Carbon tetrachloride	ND	0.050								
Chlorobenzene	ND	0.050								
Chloroethane	ND	0.10								
Chloroform	ND	0.050								
Chloromethane	ND	0.15								
2-Chlorotoluene	ND	0.050								

**Qualifiers:**

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- S % Recovery outside of range due to dilution or matrix
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- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
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# QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1509090

05-Oct-15

**Client:** Western Refining Southwest, Inc.

**Project:** Bisti Landfarm

Sample ID: <b>mb-21112</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8260B: Volatiles</b>
Client ID: <b>PBS</b>	Batch ID: <b>21112</b>	RunNo: <b>28652</b>
Prep Date: <b>9/2/2015</b>	Analysis Date: <b>9/3/2015</b>	SeqNo: <b>867327</b> Units: <b>mg/Kg</b>

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
4-Chlorotoluene	ND	0.050								
cis-1,2-DCE	ND	0.050								
cis-1,3-Dichloropropene	ND	0.050								
1,2-Dibromo-3-chloropropane	ND	0.10								
Dibromochloromethane	ND	0.050								
Dibromomethane	ND	0.050								
1,2-Dichlorobenzene	ND	0.050								
1,3-Dichlorobenzene	ND	0.050								
1,4-Dichlorobenzene	ND	0.050								
Dichlorodifluoromethane	ND	0.050								
1,1-Dichloroethane	ND	0.050								
1,1-Dichloroethene	ND	0.050								
1,2-Dichloropropane	ND	0.050								
1,3-Dichloropropane	ND	0.050								
2,2-Dichloropropane	ND	0.10								
1,1-Dichloropropene	ND	0.10								
Hexachlorobutadiene	ND	0.10								
2-Hexanone	ND	0.50								
Isopropylbenzene	ND	0.050								
4-Isopropyltoluene	ND	0.050								
4-Methyl-2-pentanone	ND	0.50								
ylene chloride	ND	0.15								
n-Butylbenzene	ND	0.15								
n-Propylbenzene	ND	0.050								
sec-Butylbenzene	ND	0.050								
Styrene	ND	0.050								
tert-Butylbenzene	ND	0.050								
1,1,1,2-Tetrachloroethane	ND	0.050								
1,1,2,2-Tetrachloroethane	ND	0.050								
Tetrachloroethene (PCE)	ND	0.050								
trans-1,2-DCE	ND	0.050								
trans-1,3-Dichloropropene	ND	0.050								
1,2,3-Trichlorobenzene	ND	0.10								
1,2,4-Trichlorobenzene	ND	0.050								
1,1,1-Trichloroethane	ND	0.050								
1,1,2-Trichloroethane	ND	0.050								
Trichloroethene (TCE)	ND	0.050								
Trichlorofluoromethane	ND	0.050								
1,2,3-Trichloropropane	ND	0.10								

**Qualifiers:**

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- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit

# QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1509090

05-Oct-15

Client: Western Refining Southwest, Inc.

Project: Bisti Landfarm

Sample ID	mb-21112	SampType:	MBLK	TestCode:	EPA Method 8260B: Volatiles					
Client ID:	PBS	Batch ID:	21112	RunNo:	28652					
Prep Date:	9/2/2015	Analysis Date:	9/3/2015	SeqNo:	867327	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: Dibromofluoromethane	0.50		0.5000		99.2	70	130			
Surr: 1,2-Dichloroethane-d4	0.48		0.5000		96.6	70	130			
Surr: Toluene-d8	0.43		0.5000		86.6	70	130			
Surr: 4-Bromofluorobenzene	0.49		0.5000		97.3	70	130			

## Qualifiers:

- |   |   |
|---|---|
| * Value exceeds Maximum Contaminant Level.              | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix                          | E Value above quantitation range                  |
| H Holding times for preparation or analysis exceeded    | J Analyte detected below quantitation limits      |
| ND Not Detected at the Reporting Limit                  | P Sample pH Not In Range                          |
| R RPD outside accepted recovery limits                  | RL Reporting Detection Limit                      |
| S % Recovery outside of range due to dilution or matrix |   |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1509090  
05-Oct-15

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm

Sample ID	<b>MB-21125</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 8310: PAHs</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>21125</b>	RunNo:	<b>28675</b>					
Prep Date:	<b>9/3/2015</b>	Analysis Date:	<b>9/8/2015</b>	SeqNo:	<b>868603</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	ND	0.25								
1-Methylnaphthalene	ND	0.25								
2-Methylnaphthalene	ND	0.25								
Benzo(a)pyrene	ND	0.010								
Surr: Benzo(e)pyrene	0.22		0.5000		44.2	24.5	139			

Sample ID	<b>LCS-21125</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 8310: PAHs</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>21125</b>	RunNo:	<b>28675</b>					
Prep Date:	<b>9/3/2015</b>	Analysis Date:	<b>9/8/2015</b>	SeqNo:	<b>868605</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	1.7	0.25	2.000	0	85.2	33.7	117			
1-Methylnaphthalene	1.7	0.25	2.000	0	85.9	32	119			
2-Methylnaphthalene	1.7	0.25	2.000	0	84.7	31.8	118			
Benzo(a)pyrene	0.010	0.010	0.01250	0	80.0	40	115			
Surr: Benzo(e)pyrene	0.28		0.5000		55.0	24.5	139			

Sample ID	<b>1509090-001AMS</b>	SampType:	<b>MS</b>	TestCode:	<b>EPA Method 8310: PAHs</b>					
Client ID:	<b>Background</b>	Batch ID:	<b>21125</b>	RunNo:	<b>28675</b>					
Prep Date:	<b>9/3/2015</b>	Analysis Date:	<b>9/8/2015</b>	SeqNo:	<b>870360</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	1.4	0.25	1.974	0	68.9	14.7	128			
1-Methylnaphthalene	1.4	0.25	1.974	0	71.5	31.1	125			
2-Methylnaphthalene	1.4	0.25	1.974	0	69.3	24.7	119			
Benzo(a)pyrene	ND	0.0099	0.01234	0	66.0	27.7	134			
Surr: Benzo(e)pyrene	0.21		0.4936		42.8	24.5	139			

Sample ID	<b>1509090-001AMSD</b>	SampType:	<b>MSD</b>	TestCode:	<b>EPA Method 8310: PAHs</b>					
Client ID:	<b>Background</b>	Batch ID:	<b>21125</b>	RunNo:	<b>28675</b>					
Prep Date:	<b>9/3/2015</b>	Analysis Date:	<b>9/8/2015</b>	SeqNo:	<b>870361</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	1.5	0.25	1.982	0	78.2	14.7	128	12.9	29.3	
1-Methylnaphthalene	1.6	0.25	1.982	0	80.9	31.1	125	12.6	20	
2-Methylnaphthalene	1.5	0.25	1.982	0	77.7	24.7	119	11.8	20	
Benzo(a)pyrene	ND	0.0099	0.01239	0	76.0	27.7	134	0	28.3	
Surr: Benzo(e)pyrene	0.24		0.4955		48.1	24.5	139	0	20	

### Qualifiers:

- |   |   |
|---|---|
| * Value exceeds Maximum Contaminant Level.              | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix                          | E Value above quantitation range                  |
| H Holding times for preparation or analysis exceeded    | J Analyte detected below quantitation limits      |
| ND Not Detected at the Reporting Limit                  | P Sample pH Not In Range                          |
| R RPD outside accepted recovery limits                  | RL Reporting Detection Limit                      |
| S % Recovery outside of range due to dilution or matrix |   |

# QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1509090

05-Oct-15

**Client:** Western Refining Southwest, Inc.

**Project:** Bisti Landfarm

Sample ID <b>MB-21211</b>	SampType: <b>MBLK</b>		TestCode: <b>EPA Method 6010B: Soil Metals</b>							
Client ID: <b>PBS</b>	Batch ID: <b>21211</b>		RunNo: <b>28745</b>							
Prep Date: <b>9/9/2015</b>	Analysis Date: <b>9/10/2015</b>		SeqNo: <b>871500</b>		Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Copper	ND	0.30								
Iron	ND	2.5								
Manganese	ND	0.10								
Uranium	ND	5.0								
Zinc	ND	2.5								

Sample ID <b>LCS-21211</b>	SampType: <b>LCS</b>		TestCode: <b>EPA Method 6010B: Soil Metals</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>21211</b>		RunNo: <b>28745</b>							
Prep Date: <b>9/9/2015</b>	Analysis Date: <b>9/10/2015</b>		SeqNo: <b>871501</b>		Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Copper	27	0.30	25.00	0	106	80	120			
Iron	26	2.5	25.00	0	104	80	120			
Manganese	25	0.10	25.00	0	98.3	80	120			
Uranium	26	5.0	25.00	0	102	80	120			
Zinc	24	2.5	25.00	0	95.5	80	120			

**Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit

**Sample Log-In Check List**

Client Name: **Western Refining Southw**

Work Order Number: **1509090**

RcptNo: **1**

Received by/date:

*[Signature]*

*09/02/15*

Logged By: **Lindsay Mangin**

**9/2/2015 8:00:00 AM**

*[Signature]*

Completed By: **Lindsay Mangin**

**9/2/2015 9:44:23 AM**

*[Signature]*

Reviewed By:

*[Signature]*

*09/02/15*

**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? Yes  No  # of preserved bottles checked for pH: (<2 or >12 unless noted)
- 13. Are matrices correctly identified on Chain of Custody? Yes  No  Adjusted?
- 14. Is it clear what analyses were requested? Yes  No
- 15. Were all holding times able to be met? Yes  No  Checked by:
- (If no, notify customer for authorization.)

**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	1.4	Good	Yes			



**TABLE 2**  
**Proposed Background Analytes and Methods**  
**Bisti Landfarm**  
**Western Refining Southwest, Inc.**

PROPOSED ANALYTE	PROPOSED METHOD
Carbon tetrachloride	EPA Method 8260B
1,2-Dichloroethane (EDC)	EPA Method 8260B
1,1-dichloroethylene (1,1-DCE)	EPA Method 8260B
1,1,2,2-Tetrachloroethylene (PCE)	EPA Method 8260B
1,1,2-Trichloroethylene (TCE)	EPA Method 8260B
Methylene chloride	EPA Method 8260B
Chloroform	EPA Method 8260B
1,1-Dichloroethane	EPA Method 8260B
Ethylene Dibromide (EDB)	EPA Method 8260B
1,1,1-Trichloroethane	EPA Method 8260B
1,1,2-Trichloroethane	EPA Method 8260B
1,1,2,2-Tetrachloroethane	EPA Method 8260B
Vinyl chloride	EPA Method 8260B
Aroclor 1016	EPA Method 8082
Aroclor 1221	EPA Method 8082
Aroclor 1232	EPA Method 8082
Aroclor 1242	EPA Method 8082
Aroclor 1248	EPA Method 8082
Aroclor 1254	EPA Method 8082
Aroclor 1260	EPA Method 8082
Radium 226	EPA Method 901.1
Radium 228	EPA Method 901.1
Phenol	EPA Method 9065
Naphthalene	EPA Method 8310
1-Methylnaphthalene	EPA Method 8310
2-Methylnaphthalene	EPA Method 8310
Benzo(a)pyrene	EPA Method 8310
GRO (C <sub>6</sub> - C <sub>10</sub> )	EPA Method 8015M
MRO (C <sub>28</sub> - C <sub>36</sub> )	EPA Method 8015M
Total Petroleum Hydrocarbons	EPA Method 418.1
Copper	EPA Method 6010 B
Iron	EPA Method 6010 B
Manganese	EPA Method 6010 B
Uranium	EPA Method 6010 B
Zinc	EPA Method 6010 B
pH	SM4500 - H+B
Fluoride	EPA Method 300.0
Nitrogen, Nitrate (As N)	EPA Method 300.0
Cyanide	EPA Method 335.4

**Notes:**

- DRO - diesel range organics
- EPA - United State Environmental Protection Agency
- GRO - gasoline range organics
- MRO - motor oil range organics



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

February 17, 2016

Kelly Robinson  
Western Refining Southwest, Inc.  
#50 CR 4990  
Bloomfield, NM 87413  
TEL: (505) 632-4166  
FAX (505) 632-3911

RE: Bisti Landfarm

OrderNo.: 1512815

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 5 sample(s) on 12/17/2015 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued December 30, 2015.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to [www.hallenvironmental.com](http://www.hallenvironmental.com) or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

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

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a horizontal line.

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109

Analytical Report

Lab Order 1512815

Date Reported: 2/17/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: Westline Vadose Zone

Project: Bisti Landfarm

Collection Date: 12/16/2015 11:35:00 AM

Lab ID: 1512815-001

Matrix: SOIL

Received Date: 12/17/2015 7:45:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>JME</b>
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	12/22/2015 1:32:37 PM	22852
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	12/22/2015 1:32:37 PM	22852
Surr: DNOP	116	70-130		%Rec	1	12/22/2015 1:32:37 PM	22852
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	12/21/2015 2:15:50 PM	22857
Surr: BFB	80.9	66.2-112		%Rec	1	12/21/2015 2:15:50 PM	22857
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>NSB</b>
Benzene	ND	0.049		mg/Kg	1	12/21/2015 2:15:50 PM	22857
Toluene	ND	0.049		mg/Kg	1	12/21/2015 2:15:50 PM	22857
Ethylbenzene	ND	0.049		mg/Kg	1	12/21/2015 2:15:50 PM	22857
Xylenes, Total	ND	0.098		mg/Kg	1	12/21/2015 2:15:50 PM	22857
Surr: 4-Bromofluorobenzene	109	80-120		%Rec	1	12/21/2015 2:15:50 PM	22857

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
D	Sample Diluted Due to Matrix	E Value above quantitation range
H	Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P Sample pH Not In Range
R	RPD outside accepted recovery limits	RL Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Analytical Report

Lab Order 1512815

Date Reported: 2/17/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: Eastline Vadose Zone

Project: Bisti Landfarm

Collection Date: 12/16/2015 11:15:00 AM

Lab ID: 1512815-002

Matrix: SOIL

Received Date: 12/17/2015 7:45:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>JME</b>
Diesel Range Organics (DRO)	10	10		mg/Kg	1	12/22/2015 1:54:33 PM	22852
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	12/22/2015 1:54:33 PM	22852
Surr: DNOP	100	70-130		%Rec	1	12/22/2015 1:54:33 PM	22852
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	12/21/2015 2:40:36 PM	22857
Surr: BFB	80.8	66.2-112		%Rec	1	12/21/2015 2:40:36 PM	22857
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>NSB</b>
Benzene	ND	0.048		mg/Kg	1	12/21/2015 2:40:36 PM	22857
Toluene	ND	0.048		mg/Kg	1	12/21/2015 2:40:36 PM	22857
Ethylbenzene	ND	0.048		mg/Kg	1	12/21/2015 2:40:36 PM	22857
Xylenes, Total	ND	0.096		mg/Kg	1	12/21/2015 2:40:36 PM	22857
Surr: 4-Bromofluorobenzene	107	80-120		%Rec	1	12/21/2015 2:40:36 PM	22857

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
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Analytical Report

Lab Order 1512815

Date Reported: 2/17/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: Bisti Vadose Zone

Project: Bisti Landfarm

Collection Date: 12/16/2015 12:00:00 PM

Lab ID: 1512815-003

Matrix: SOIL

Received Date: 12/17/2015 7:45:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>JME</b>
Diesel Range Organics (DRO)	28	9.5		mg/Kg	1	12/22/2015 2:16:13 PM	22852
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	12/22/2015 2:16:13 PM	22852
Surr: DNOP	106	70-130		%Rec	1	12/22/2015 2:16:13 PM	22852
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	12/21/2015 3:05:18 PM	22857
Surr: BFB	81.2	66.2-112		%Rec	1	12/21/2015 3:05:18 PM	22857
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>NSB</b>
Benzene	ND	0.048		mg/Kg	1	12/21/2015 3:05:18 PM	22857
Toluene	ND	0.048		mg/Kg	1	12/21/2015 3:05:18 PM	22857
Ethylbenzene	ND	0.048		mg/Kg	1	12/21/2015 3:05:18 PM	22857
Xylenes, Total	ND	0.096		mg/Kg	1	12/21/2015 3:05:18 PM	22857
Surr: 4-Bromofluorobenzene	107	80-120		%Rec	1	12/21/2015 3:05:18 PM	22857

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

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Analytical Report

Lab Order 1512815

Date Reported: 2/17/2016

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: Pettigrew Vadose Zone

Project: Bisti Landfarm

Collection Date: 12/16/2015 12:25:00 PM

Lab ID: 1512815-004

Matrix: SOIL

Received Date: 12/17/2015 7:45:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>JME</b>
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	12/22/2015 2:37:56 PM	22852
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	12/22/2015 2:37:56 PM	22852
Surr: DNOP	104	70-130		%Rec	1	12/22/2015 2:37:56 PM	22852
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	12/21/2015 3:29:54 PM	22857
Surr: BFB	85.8	66.2-112		%Rec	1	12/21/2015 3:29:54 PM	22857
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>NSB</b>
Benzene	ND	0.050		mg/Kg	1	12/21/2015 3:29:54 PM	22857
Toluene	ND	0.050		mg/Kg	1	12/21/2015 3:29:54 PM	22857
Ethylbenzene	ND	0.050		mg/Kg	1	12/21/2015 3:29:54 PM	22857
Xylenes, Total	ND	0.099		mg/Kg	1	12/21/2015 3:29:54 PM	22857
Surr: 4-Bromofluorobenzene	117	80-120		%Rec	1	12/21/2015 3:29:54 PM	22857

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

**Hall Environmental Analysis Laboratory, Inc.**

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: API Vadose Zone

Project: Bisti Landfarm

Collection Date: 12/16/2015 12:15:00 PM

Lab ID: 1512815-005

Matrix: SOIL

Received Date: 12/17/2015 7:45:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>JME</b>
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	12/22/2015 2:59:35 PM	22852
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	12/22/2015 2:59:35 PM	22852
Surr: DNOP	100	70-130		%Rec	1	12/22/2015 2:59:35 PM	22852
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	12/21/2015 3:54:33 PM	22857
Surr: BFB	81.6	66.2-112		%Rec	1	12/21/2015 3:54:33 PM	22857
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>NSB</b>
Benzene	ND	0.048		mg/Kg	1	12/21/2015 3:54:33 PM	22857
Toluene	ND	0.048		mg/Kg	1	12/21/2015 3:54:33 PM	22857
Ethylbenzene	ND	0.048		mg/Kg	1	12/21/2015 3:54:33 PM	22857
Xylenes, Total	ND	0.097		mg/Kg	1	12/21/2015 3:54:33 PM	22857
Surr: 4-Bromofluorobenzene	110	80-120		%Rec	1	12/21/2015 3:54:33 PM	22857

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
D	Sample Diluted Due to Matrix	E Value above quantitation range
H	Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P Sample pH Not In Range
R	RPD outside accepted recovery limits	RL Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

**QC SUMMARY REPORT**  
**Hall Environmental Analysis Laboratory, Inc.**

WO#: 1512815  
 17-Feb-16

**Client:** Western Refining Southwest, Inc.  
**Project:** Bisti Landfarm

Sample ID	<b>MB-22852</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 8015M/D: Diesel Range Organics</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>22852</b>	RunNo:	<b>31000</b>					
Prep Date:	<b>12/17/2015</b>	Analysis Date:	<b>12/22/2015</b>	SeqNo:	<b>948209</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.6		10.00		95.7	70	130			

Sample ID	<b>LCS-22852</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 8015M/D: Diesel Range Organics</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>22852</b>	RunNo:	<b>31000</b>					
Prep Date:	<b>12/17/2015</b>	Analysis Date:	<b>12/22/2015</b>	SeqNo:	<b>948239</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	57	10	50.00	0	114	65.8	136			
Surr: DNOP	5.0		5.000		99.1	70	130			

**Qualifiers:**

- |   |   |
|---|---|
| * Value exceeds Maximum Contaminant Level.              | B Analyte detected in the associated Method Blank           |
| D Sample Diluted Due to Matrix                          | E Value above quantitation range                            |
| H Holding times for preparation or analysis exceeded    | J Analyte detected below quantitation limits                |
| ND Not Detected at the Reporting Limit                  | P Sample pH Not In Range                                    |
| R RPD outside accepted recovery limits                  | RL Reporting Detection Limit                                |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1512815

17-Feb-16

**Client:** Western Refining Southwest, Inc.

**Project:** Bisti Landfarm

Sample ID <b>MB-22857</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015D: Gasoline Range</b>								
Client ID: <b>PBS</b>	Batch ID: <b>22857</b>	RunNo: <b>30983</b>								
Prep Date: <b>12/17/2015</b>	Analysis Date: <b>12/21/2015</b>	SeqNo: <b>947868</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	870		1000		87.2	66.2	112			

Sample ID <b>LCS-22857</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8015D: Gasoline Range</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>22857</b>	RunNo: <b>30983</b>								
Prep Date: <b>12/17/2015</b>	Analysis Date: <b>12/21/2015</b>	SeqNo: <b>947869</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	5.0	25.00	0	105	79.6	122			
Surr: BFB	950		1000		94.9	66.2	112			

**Qualifiers:**

- |   |   |
|---|---|
| * Value exceeds Maximum Contaminant Level.              | B Analyte detected in the associated Method Blank           |
| D Sample Diluted Due to Matrix                          | E Value above quantitation range                            |
| H Holding times for preparation or analysis exceeded    | J Analyte detected below quantitation limits                |
| ND Not Detected at the Reporting Limit                  | P Sample pH Not In Range                                    |
| R RPD outside accepted recovery limits                  | RL Reporting Detection Limit                                |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1512815

17-Feb-16

**Client:** Western Refining Southwest, Inc.

**Project:** Bisti Landfarm

Sample ID	<b>MB-22857</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 8021B: Volatiles</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>22857</b>	RunNo:	<b>30983</b>					
Prep Date:	<b>12/17/2015</b>	Analysis Date:	<b>12/21/2015</b>	SeqNo:	<b>947896</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.050								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.2		1.000		121	80	120			S

Sample ID	<b>LCS-22857</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 8021B: Volatiles</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>22857</b>	RunNo:	<b>30983</b>					
Prep Date:	<b>12/17/2015</b>	Analysis Date:	<b>12/21/2015</b>	SeqNo:	<b>947897</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.98	0.050	1.000	0	97.6	80	120			
Toluene	0.98	0.050	1.000	0	98.0	80	120			
Ethylbenzene	0.99	0.050	1.000	0	98.8	80	120			
Xylenes, Total	3.0	0.10	3.000	0	100	80	120			
Surr: 4-Bromofluorobenzene	1.2		1.000		118	80	120			

**Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified



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: **Western Refining Southw**

Work Order Number: **1512815**

RcptNo: **1**

Received by/date:

*JA*

*12/17/15*

Logged By: **Joe Archuleta**

**12/17/2015 7:45:00 AM**

*JE-BA*

Completed By: **Joe Archuleta**

**12/17/2015 10:33:55 AM**

*JE-BA*

Reviewed By:

*[Signature]*

*12/17/15*

**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:

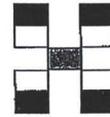
**Cooler Information**

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

# Chain-of-Custody Record

Client: Kelly Robinson  
Western Refining  
 Mailing Address: 111 CR 4990  
Bloomfield, NM  
 Phone #: (505) 632-8013  
 email or Fax#: Kelly.Robinson@WNR.com  
 QA/QC Package:  
 Standard  Level 4 (Full Validation)  
 Accreditation  
 NELAP  Other \_\_\_\_\_  
 EDD (Type) \_\_\_\_\_

Turn-Around Time:  
 Standard  Rush  
 Project Name:  
Bisti Landfarm  
 Project #:  
WR1005  
 Project Manager:  
Brooke Herb  
 Sampler: M. Wicker / J. Adams  
 On Ice  Yes  No  
 Sample Temperature: 10



## 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 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F, Cl, NO <sub>3</sub> , NO <sub>2</sub> , PO <sub>4</sub> , SO <sub>4</sub> )	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	BTEX (8021)	TPH (GRO/DRO) 8015(M)	Air Bubbles (Y or N)	
2-16-15	11:35	Soil	Westline Vadose Zone	Jars/2	Cool	-001													X	X	
	11:15		Eastline Vadose Zone			-002													X	X	
	12:00		Bisti Vadose Zone			-003													X	X	
	12:25		Pettigrew Vadose Zone			-004													X	X	
	12:15		API Vadose Zone			-005													X	X	

Date: 2-16-15 Time: 1500 Relinquished by: John Adams  
 Received by: Chris Walt Date: 12/16/15 Time: 1500  
 Date: 1/14/15 Time: 1804 Relinquished by: Int Walk  
 Received by: Joe. Cant Date: 12/17/15 Time: 0745

Remarks: Please CC: BHerb@LTEnv.com  
A.Ager@LTEnv.com  
MWicker@LTEnv.com  
JAdams@LTEnv.com  
PO# 12610957

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.