CONTINUED MINIMUM SITE ASSESSMENT REPORT for SHAMROCK #63 3624 CERRILLOS ROAD SANTA FE, NEW MEXICO

November 28, 2007

Prepared for:

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Investigation Report Forms

Risk-Based Decision Making For Petroleum Releases At Underground Storage Tank Sites In New Mexico

SITE NAME:	*Shamrock #63*
SITE LOCATION:	*3624 Cerrillos Road, Santa Fe, New Mexico*
SITE ID:	*4509*
FACILITY ID:	*29206*
SUBMITTAL DATE:	*November 28, 2007*
PREPARED BY:	*Michael Hannigan, P.E.*
REVIEWED BY:	*John E. Casey, P.E.*

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☐ *Check the box against the item, if the item is included.*

Form No.	Description	INVESTIGATION REPORT FORMS	
1.	Executive summary.		☑
2.	NAPL information.		☑
3.	Site stratigraphy and hydrogeology.		☑
4.	Analytical data summary for surficial soil (0-1 ft bgs).		☐
5.	Analytical data summary for subsurface soil (1 ft bgs to water table).		☑
6.	Analytical data summary for groundwater.		☑
7.	Conclusions and recommendations.		☑
8.	References and protocols.		☑

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All maps submitted to NMED must include a bar scale, legend, north arrow, location of all known soil borings and monitoring wells, and date of map, where appropriate.

☐ *Check the box against the item, if the item is included.*

Map No.	Description	MAPS

Maps 1-6 are part of 14 Day Report. Update and resubmit as appropriate.

Note: Maps may be combined ,as pappropriate.

1. Topographic map. ☑
2. Site map with UST system location(s), including tank ID number(s). ☑
3. Site map with utility locations. ☑
4. Land use map (radius of 1,000 feet). ☑
5. Receptor survey map: with detailed land use in the vicinity of the site (at least 1,000 feet in the downgradient direction and one property deep on all other sides including across the street). ☑
6. Area map with water use well locations: within one mile radius of the site (the wells on the map must be labeled). Maps must also indicate the location of surface water drains including but not limited to streams, lakes, and well head protection areas, within a 500 foot radius of the site. ☑
7. NAPL thickness contour map. ☐
8. Area geologic map. ☑
9. Groundwater gradient map: contoured map with the predominant flow direction from the most recent gauging event (add additional maps if the flow direction fluctuates). ☐
10. Soil and groundwater concentration contour maps showing boring and well locations and concentrations in each: for benzene, MTBE, total BTEX, and Total PAHs from the most recent sampling event. ☐

ADDITIONAL MAPS:

10a - Soil Analytical Map

10b - Soil Boring Profile

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☐ *Check the box against the item, if the item is included.*

Attachment No. Description **ATTACHMENTS**

Attachments 1 and 2 are part of 14 Day Report. Update and resubmit as appropriate.

1. Most recent UST system test results. ☐
2. Vapor screening results for utilities. ☐
3. Estimation of NAPL present: Estimated thickness vs measured thickness of NAPL. Include calculation brief for estimated thickness. ☐
4. Monitoring well construction digram. ☑
5. Representative soil boring logs: cross-section(s) showing the stratigraphy of the site and the extent of contamination. ☑
6. Historical groundwater monitoring data for all the monitoring wells. Include any data collected from temporary wells or borings. ☐
7. Contaminant concentration and depth to groundwater vs. time graphs for wells with four or more sampling events. ☐

ADDITIONAL ATTACHMENTS:

Laboratory analytical report(s) not previously submitted to the department.

Particle Size Distribution Reports

Summary Table of Soil Geotechnical Properties

Summary Table of Ground Water Depth and Field Parameter Data

NEW MEXICO RBDM	INVESTIGATION REPORT	FORM NO. 1
SITE ID: 4509	FACILITY ID: 29206	
SUBMITTAL DATE: 28-Nov-07	PREPARED BY: Michael Hannigan, P.E.	

EXECUTIVE SUMMARY

Facility name:	*Shamrock #63*
Facility address:	*3624 Cerrillos Road* *Santa Fe, New Mexico*
Status of UST system facility:	☐ Active ☑ Inactive
Ground surface condition:	*Asphalt pavement except in area of former building & USTs*
Estimated volume and type of product(s) released:	*Unknown quantity of gasoline and diesel fuel*
Has any vapor impacts been identified?	☑ No ☐ On-site ☐ Off-site
If yes (check all that apply):	☐ Utility corridor ☐ Subsurface structures ☐ Above surface structures
Is soil contaminated?	☐ No ☑ On-site ☐ Off-site
Is there any contaminant-saturated soil?	☑ No ☐ On-site ☐ Off-site
Is groundwater contaminated?	☐ No ☑ On-site ☐ Off-site
Has the source of release been identified?	☑ Yes ☐ No *Former UST system*
Has NAPL ever been detected?	☐ Yes ☑ No
Was NAPL removed?	☐ Yes ☑ No
Was NAPL detected in the most recent sampling event?	☐ Yes ☑ No
Has surface water been contaminated by the release?	☐ Yes ☑ No ☐ Unknown ☐ Suspected
Shallowest depth to groundwater (ft bgs.):	
Average depth to groundwater (ft bgs.):	*80 feet (actual measurement)*
Has a drinking water supply well been contaminated by this release?	☐ Yes ☐ No ☑ Unknown ☐ Suspected
If yes	☐ Drinking ☐ Irrigation ☐ Other

RECOMMENDATIONS

- ☑ Collect additional soil data
- ☑ Collect additional groundwater data
- ☐ Continue NAPL removal
- ☐ Perform interim remedial action
- ☑ GW monitoing
- ☐ Perform a tier 1 evaluation

ADDITIONAL NOTES

A single grounwater moniring well was installed and sampled. Impacts to ground water exceed WQCC and EIB standards for benzene, total xylenes, MTBE, EDC and PAHs.

NEW MEXICO RBDM	INVESTIGATION REPORT	FORM NO. 2

SITE ID: 4509	FACILITY ID: 29206
SUBMITTAL DATE: 28-Nov-07	PREPARED BY: Michael Hannigan, P.E.

NAPL INFORMATION

Has NAPL been found at the site? ☐ Yes ☑ No

(Note if No, proceed to the next report form)

Date NAPL first reported at the site (if known):

Type(s) of NAPL released:

Estimated quantity of NAPL present (attach calculation brief):

List the monitoring wells currently containing NAPL:

Has NAPL removal been initiated? ☐ Yes ☐ No

If Yes, specify method of removal (bailer, pump, etc.)?

If No, cite reason:

Frequency of removal (weekly, monthly, etc.):

Total number of recovery events to date:

Total amount of water recovered:

Water disposal method:

Total amount of NAPL recovered:

NAPL disposal method:

Date of latest NAPL report submittal:

ADDITIONAL NOTES

NEW MEXICO RBDM	INVESTIGATION REPORT	FORM NO. 3
SITE ID: 4509	FACILITY ID: 29206	
SUBMITTAL DATE: 28-Nov-07	PREPARED BY: Michael Hannigan, P.E.	

SITE STRATIGRAPHY AND HYDROGEOLOGY

STRATIGRAPHY OF THE SITE

Depth [feet]	Unified soil classification	Type of soil
0 to 15	Fill	Clay, silt, sand & gravel
15 to 63	SM	Decomposed granite, traces of clay, some cobble
63 to 65.5	SC	Sandy Clay, soft
65.5 to 83.8	SM	Decomposed granite, traces of clay, some cobble
83.8 to 94	SM	SAND, fine to med. Grained, saturated
Predominant soil type:	Decomposed granite	

Depth [feet]	Type of bedrock & geological formation (discuss rock properties and features)
Decomposed granite	Hard to very hard, moist to dry, brown to lt. brown, trace clay, non-plastic, some cobble layers occur beneath site between 20 to 57 feet bgs and 63 to at least 84 feet bgs. A sand layer occurs from 84 to at least 94 feet bgs.

HYDROGEOLOGY OF THE SATURATED ZONE

Type of contaminated aquifer(s)? ☐ Confined ☑ Unconfined ☐ Perched

Underlying predominant aquifer name:	unknown
TDS of contaminated aquifer(s) [mg/L]	911
Describe groundwater level fluctuations:	insufficient data to describe, only one well and one sampling event
Average depth to static water level:	79.76
Average static water elevation relative to MSL [ft]	Unknown
Flow direction:	Southwest (assumed based on regional topography)
Hydraulic gradient (i) [ft/ft]:	unknown
Hydraulic conductivity (K) [cm/day]:	1.0 to 10.0

Hydraulic conductivity test method:

☑ Grain size/Sieve analysis ☐ Slug test ☐ Pumping test; Duration (hrs):

☐ Other (*specify and attach literature as appropriate*)

Darcy velocity (K x i) [cm/year]:	Unknown (i is unknown)
Annual precipitation (average for last 10 years) [cm/year]:	38.71 cm/year

UNSATURATED ZONE CHARACTERISTICS

	Values/range			Method
Dry bulk density [g/cm^3]	1.8 to 2.2	☑ Estimated	☐ Measured	
Estimated porosity (θ) [cm^3/cm^3]:	0.4 to 0.6	☑ Estimated	☐ Measured	
Water content in volumetric units [cm^3/cm^3]:	0.10 to 0.12	☐ Estimated	☑ Measured	ASTM 2216
Fractional organic carbon content [g-C/g-soil]:	<0.13	☐ Estimated	☑ Measured	Walkley Black

ADDITIONAL NOTES

Ground water occurs in the fine- to medium-grained silty sand.

NEW MEXICO RBDM	INVESTIGATION REPORT	FORM NO. 5
SITE ID: 4509	FACILITY ID: 29206	
SUBMITTAL DATE: 28-Nov-07	PREPARED BY: Michael Hannigan, P.E.	

ANALYTICAL DATA SUMMARY FOR SUBSURFACE SOIL (1 FT BGS TO WATER TABLE) [mg/kg]

MW / SB No.	SB-1			SB-2			SB-3/MW-1													
Sampling date	2/16/2007			2/15/2007			11/7/2007													
Sample depth (ft)	15	75		7	50		21	64	79											
ORGANIC CHEMICALS																				
Benzene	0.7	0.19		<0.29	0.22		<0.05	<0.05	<0.05											
Toluene	4.9	0.11		<0.29	1.9		0.18	0.053	<0.05											
Ethylbenzene	1.1	<0.056		0.3	0.24		0.35	<0.05	<0.05											
Xylenes (Total)	6.3	0.2		0.74	1.1		2.7	<0.1	<0.1											
Ethylene Dibromide (EDB)	<0.27	<0.056		<0.29	<0.056		<0.05	<0.05	<0.05											
1,2-Dichloroethane (EDC)	<0.27	<0.056		<0.29	<0.056		<0.05	<0.05	<0.05											
MTBE	<0.27	0.19		<0.29	<0.056		<0.05	0.19	<0.05											
POLYCYCLIC AROMATIC HYDROCARBONS																				
Acenaphthene	<1.3	<0.28		<14	<0.28		<0.25	<0.25	<0.25											
Anthracene	<0.08	<0.017		<0.87	<0.017		<0.015	<0.015	<0.015											
Benzo(a)anthracene	<0.011	<0.0022		<0.12	<0.0022		<0.002	<0.002	<0.002											
Benzo(a)-pyrene	0.011	<0.0011		<0.058	0.0011		<0.001	<0.001	<0.001											
Benzo(b)-fluoranthene	<0.021	<0.0045		<0.23	<0.0045		<0.004	<0.004	<0.004											
Benzo(k)-flouranthene	0.012	<0.0011		0.14	<0.0011		<0.001	<0.001	<0.001											
Chrysene	<0.059	<0.012		2.2	<0.012		0.011	<0.011	<0.011											
Dibenz(a,h)anthracene	<0.016	<0.0033		<0.17	<0.0034		<0.003	<0.003	<0.003											
Fluoranthene	<0.11	<0.022		<1.2	<0.022		<0.02	<0.02	<0.02											
Fluorene	<0.16	<0.033		2	<0.034		<0.03	<0.03	<0.03											
Total Naphthalenes	7.2	<0.028		56	<0.28		<0.25	<0.25	<0.25											
Phenanthrene	0.13	<0.017		12	<0.017		0.036	<0.015	<0.015											
Pyrene	<0.13	<0.028		<1.4	<0.028		<0.025	<0.025	<0.025											
INORGANIC CHEMICALS																				
Lead	2.8	3		3.3	5.7															

NOTE:
Provide any laboratory analytical report(s) not previously submitted to NMED Office. Add additional sheets as needed.
Non-detects can be expressed as "<(value of detection limit)". All concentrations should be in mg/kg.

NEW MEXICO RBDM	INVESTIGATION REPORT	FORM NO. 6
SITE ID: 4509	FACILITY ID: 29206	
SUBMITTAL DATE: 28-Nov-07	PREPARED BY: Michael Hannigan, P.E.	

ANALYTICAL DATA SUMMARY FOR GROUNDWATER

Monitoring well number		*MW-1*											
Screen interval (feet below TOC)		74 TO 94											
Water level (feet below TOC)		79.76											
Installation date (month/year)		11/8/2007											
Number of times sampled		1											
Benzene	No. of detects	1											
WQCC STD. = 10 µg/L	Range (low - high)												
	Maximum (µg/l)	1700											
	Mean (µg/l)												
	Recent trend												
Toluene	No. of detects	1											
WQCC STD. = 750 µg/L	Range (low - high)												
	Maximum (µg/l)	260											
	Mean (µg/l)												
	Recent trend												
Ethylbenzene	No. of detects	1											
WQCC STD. = 750 µg/L	Range (low - high)												
	Maximum (µg/l)	85											
	Mean (µg/l)												
	Recent trend												
Xylenes	No. of detects	1											
WQCC STD. = 620 µg/L	Range (low - high)												
	Maximum (µg/l)	1000											
	Mean (µg/l)												
	Recent trend												

NOTE: Provide any laboratory report(s) not previously submitted to NMED Office. Add additional sheets as needed.
For "Range", use all available data.
For "Maximum" and "Mean", use the recent two (2) years' data.
For "Recent Trend", use the recent 2 years' data or the recent 8 measurements, as appropriate.

NEW MEXICO RBDM	INVESTIGATION REPORT	FORM NO. 6
SITE ID: 4509	FACILITY ID: 29206	
SUBMITTAL DATE: 28-Nov-07	PREPARED BY: Michael Hannigan, P.E.	

ANALYTICAL DATA SUMMARY FOR GROUNDWATER

Monitoring well number		*MW-1*												
Screen interval (feet below TOC)		74 to 94												
Water level (feet below TOC)		79.76												
Installation date (month/year)		11/8/2007												
Number of times sampled		1												
EDB	No. of detects	1												
WQCC STD. = 0.1 µg/L	Range (low - high)													
	Maximum (µg/l)	<10												
	Mean (µg/l)													
	Recent trend													
EDC	No. of detects	1												
WQCC STD. = 10 µg/L	Range (low - high)													
	Maximum (µg/l)	41												
	Mean (µg/l)													
	Recent trend													
MTBE	No. of detects	1												
WQCC STD. = 100 µg/L	Range (low - high)													
	Maximum (µg/l)	1100												
	Mean (µg/l)													
	Recent trend													
Acenaphthene*	No. of detects	1												
Risk-based Target = 2,200 µg/L	Range (low - high)													
	Maximum (µg/l)	<5												
	Mean (µg/l)													
	Recent trend													

NOTE: Provide any laboratory report(s) not previously submitted to NMED Office. Add additional sheets as needed.

For "Range", use all available data.

For "Maximum" and "Mean", use the recent two (2) years' data.

For "Recent Trend", use the recent 2 years' data or the recent 8 measurements, as appropriate.

*** No WQCC Standard available, value shown is estimated (refer Table 4-7 of Guidance Document).**

NEW MEXICO RBDM	INVESTIGATION REPORT	FORM NO. 6
SITE ID: 4509	FACILITY ID: 29206	
SUBMITTAL DATE: 28-Nov-07	PREPARED BY: Michael Hannigan, P.E.	

ANALYTICAL DATA SUMMARY FOR GROUNDWATER

Monitoring well number		MW-1											
Screen interval (feet below TOC)		74 TO 94											
Water level (feet below TOC)		79.76											
Installation date (month/year)		11/8/2007											
Number of times sampled		1											
Anthracene*	No. of detects	1											
Risk-based Target = 11,000 µg/L	Range (low - high)												
	Maximum (µg/l)	<0.60											
	Mean (µg/l)												
	Recent trend												
Benzo(a)anthracene*	No. of detects	1											
Risk-based Target = 1.2 µg/L	Range (low - high)												
	Maximum (µg/l)	<0.05											
	Mean (µg/l)												
	Recent trend												
Benzo(a)pyrene	No. of detects	1											
WQCC STD = 0.7 µg/L	Range (low - high)												
	Maximum (µg/l)	<0.03											
	Mean (µg/l)												
	Recent trend												
Benzo(b)-fluoranthene*	No. of detects	1											
Risk-based Target = 1.2 µg/L	Range (low - high)												
	Maximum (µg/l)	<0.1											
	Mean (µg/l)												
	Recent trend												

NOTE: Provide any laboratory report(s) not previously submitted to NMED Office. Add additional sheets as needed.

For "Range", use all available data.

For "Maximum" and "Mean", use the recent two (2) years' data.

For "Recent Trend", use the recent 2 years' data or the recent 8 measurements, as appropriate.

* No WQCC Standard available, value shown is estimated (refer Table 4-7 of Guidance Document).

NEW MEXICO RBDM	INVESTIGATION REPORT	FORM NO. 6
SITE ID: 4509		FACILITY ID: 29206
SUBMITTAL DATE: 28-Nov-07		PREPARED BY: Michael Hannigan, P.E.

ANALYTICAL DATA SUMMARY FOR GROUNDWATER

Monitoring well number		*MW-1*											
Screen interval (feet below TOC)		*74 to 94*											
Water level (feet below TOC)		*79.76*											
Installation date (month/year)		*11/8/2007*											
Number of times sampled		*1*											
Benzo(k)-fluoranthene*	No. of detects	*1*											
Risk-based Target = 1.2 µg/L	Range (low - high)												
	Maximum (µg/l)	*<0.02*											
	Mean (µg/l)												
	Recent trend												
Chrysene*	No. of detects	*1*											
Risk-based Target = 117 µg/L	Range (low - high)												
	Maximum (µg/l)	*<0.2*											
	Mean (µg/l)												
	Recent trend												
Dibenz(a,h)anthracene*	No. of detects	*1*											
Risk-based Target = 0.12 µg/L	Range (low - high)												
	Maximum (µg/l)	*<0.04*											
	Mean (µg/l)												
	Recent trend												
Fluoranthene*	No. of detects	*1*											
Risk-based Target = 1,460 µg/L	Range (low - high)												
	Maximum (µg/l)	*<0.3*											
	Mean (µg/l)												
	Recent trend												

NOTE: Provide any laboratory report(s) not previously submitted to NMED Office. Add additional sheets as needed.

For "Range", use all available data.

For "Maximum" and "Mean", use the recent two (2) years' data.

For "Recent Trend", use the recent 2 years' data or the recent 8 measurements, as appropriate.

*** No WQCC Standard available, value shown is estimated (refer Table 4-7 of Guidance Document).**

NEW MEXICO RBDM	INVESTIGATION REPORT	FORM NO. 6
SITE ID: 4509	FACILITY ID: 29206	
SUBMITTAL DATE: 28-Nov-07	PREPARED BY: Michael Hannigan, P.E.	

ANALYTICAL DATA SUMMARY FOR GROUNDWATER

Monitoring well number		MW-1											
Screen interval (feet below TOC)		74 to 94											
Water level (feet below TOC)		79.76											
Installation date (month/year)		11/8/2007											
Number of times sampled		1											
Fluorene*	No. of detects	1											
Risk-based Target = 1,460 µg/L	Range (low - high)												
	Maximum (µg/l)	<0.8											
	Mean (µg/l)												
	Recent trend												
Total Naphthalenes	No. of detects	1											
WQCC STD. = 30 µg/L	Range (low - high)												
	Maximum (µg/l)	131											
	Mean (µg/l)												
	Recent trend												
Phenanthrene*	No. of detects	1											
Risk-based Target = 1,100 µg/L	Range (low - high)												
	Maximum (µg/l)	<0.6											
	Mean (µg/l)												
	Recent trend												
Pyrene*	No. of detects	1											
Risk-based Target = 1,100 µg/L	Range (low - high)												
	Maximum (µg/l)	<0.3											
	Mean (µg/l)												
	Recent trend												

NOTE: Provide any laboratory report(s) not previously submitted to NMED Office. Add additional sheets as needed.

For "Range", use all available data.

For "Maximum" and "Mean", use the recent two (2) years' data.

For "Recent Trend", use the recent 2 years' data or the recent 8 measurements, as appropriate.

*** No WQCC Standard available, value shown is estimated (refer Table 4-7 of Guidance Document).**

NEW MEXICO RBDM	INVESTIGATION REPORT	FORM NO. 6

SITE ID: 4509	FACILITY ID: 29206
SUBMITTAL DATE: 28-Nov-07	PREPARED BY: Michael Hannigan, P.E.

ANALYTICAL DATA SUMMARY FOR GROUNDWATER

Monitoring well number		*MW-1*											
Screen interval (feet below TOC)		*74 to 94*											
Water level (feet below TOC)		*79.76*											
Installation date (month/year)		*11/8/2007*											
Number of times sampled		*0*											
Lead WQCC STD = 50 µg/L	No. of detects	*0*											
	Range (low - high)												
	Maximum (µg/l)												
	Mean (µg/l)												
	Recent trend												
	No. of detects												
	Range (low - high)												
	Maximum (µg/l)												
	Mean (µg/l)												
	Recent trend												
	No. of detects												
	Range (low - high)												
	Maximum (µg/l)												
	Mean (µg/l)												
	Recent trend												
	No. of detects												
	Range (low - high)												
	Maximum (µg/l)												
	Mean (µg/l)												
	Recent trend												

NOTE: Provide any laboratory report(s) not previously submitted to NMED Office. Add additional sheets as needed.

For "Range", use all available data.

For "Maximum" and "Mean", use the recent two (2) years' data.

For "Recent Trend", use the recent 2 years' data or the recent 8 measurements, as appropriate.

*** No WQCC Standard available, value shown is estimated (refer Table 4-7 of Guidance Document).**

NEW MEXICO RBDM	INVESTIGATION REPORT	FORM NO. 7
SITE ID: 4509	FACILITY ID: 29206	
SUBMITTAL DATE: 28-Nov-07	PREPARED BY: Michael Hannigan, P.E.	

CONCLUSIONS AND RECOMMENDATIONS

1.	*Has NAPL been removed?*
	N/A
2.	*Has the site (soil and aquifer) been adequately investigated and characterized?*
	No. Soil impacts have not been delineated spatially or verically. The soil impact appears to be gasoline related more than diesel.
3.	*Has the source soil(s) been delineated spatially and vertically, on-site and off-site? Are the available soil data collected within the last 5 years?*
	Soil impacts have not been delineated spatially. Available data has been collected in the last 5 years.
4.	*Has groundwater plume been delineated in all directions?*
	No, Only one (1) groundwater monitoring well has been installed and it is impacted above actions lecvels for many gasoline related compounds.
5.	*Have all relevant COCs (based on the product released) been analyzed for in soil and groundwater?*
	All relevant COCs have been analyzed for in soil and ground water.
6.	*Have the recommended laboratory methods been used and required QA/QC met?*
	Yes

NEW MEXICO RBDM	INVESTIGATION REPORT	FORM NO. 7
SITE ID: 4509	FACILITY ID: 29206	
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CONCLUSIONS AND RECOMMENDATIONS

7.	*Is the plume stable or shrinking, based on the concentration trend plots?*
	Unknown, data are insufficient to make that determination
8.	*Are the groundwater contaminant concentrations in all monitoring wells below the applicable standards for the 8 consecutive quarters (4 consecutive quarters for wells with clear decreasing concentration trends)?*
	No
9.	*Is a waiver petition required for alternative groundwater protection standards? If the answer to Question No.8 is yes, no waiver petition is required and groundwater protection pathway need not be included in any risk-based evaluation of the site.*
	N/A
10.	*Other relevant information*
11.	*Is a tier 1 risk-based evaluation of the site necessary?*
	No, the ground water plume must be delineated
12.	*Is groundwater monitoring recommended?*
	Yes, ground water monitoring and delineation of the ground water plume are recommended to determine the degree of impact.

NEW MEXICO RBDM	INVESTIGATION REPORT	FORM NO. 8
SITE ID: 4509	FACILITY ID: 29206	
SUBMITTAL DATE: 28-Nov-07	PREPARED BY: Michael Hannigan, P.E.	

REFERENCES AND PROTOCOLS

Basin Engineering Standard Operating Procedures (SOPs) are attached for 1) Field screening soil samples using the heated headspace methodology, 2) Soil sample collection using the methanol extraction procedure, 3) Monitoring well installation and 4) Ground water sampling.

TABLES

Table 1
Summary of Soil Geotechnical Parameter Data

Sample ID	Sample Date	Moisture Content (%)	Total Organic Carbon[(1)] (%C)	d_{10} (mm)	d_{50} (mm)	d_{60} (mm)	C_u	USCS Classif-ication
SB-3 @ 21-27'	7-Nov-07	6.4	<0.13	0.031	0.31	0.38	12	SM
SB-3 @ 34-43'	7-Nov-07	NM	<0.13	0.019	0.83	1.60	84	SM
SB-3 @ 52-58'	7-Nov-07	NM	<0.13	0.017	0.42	0.81	48	SM
SB-3 @ 64-65'	7-Nov-07	14.8	<0.13	NM	NM	NM	NM	SM
SB-3 @ 79-80'	7-Nov-07	8.6	<0.13	NM	NM	NM	NM	SM

Notes:

(1) TOC by Walkley Black Method

d_{10} = particle size which 10% of sample is finer

d_{50} = Median particle diameter of sample

d_{60} = particle size which 60% of sample is finer

C_u = Uniformity Coefficient (d_{60} / d_{10})

mm = millimeters

SM = Silty Sands, poorly graded sand-silt mixtures

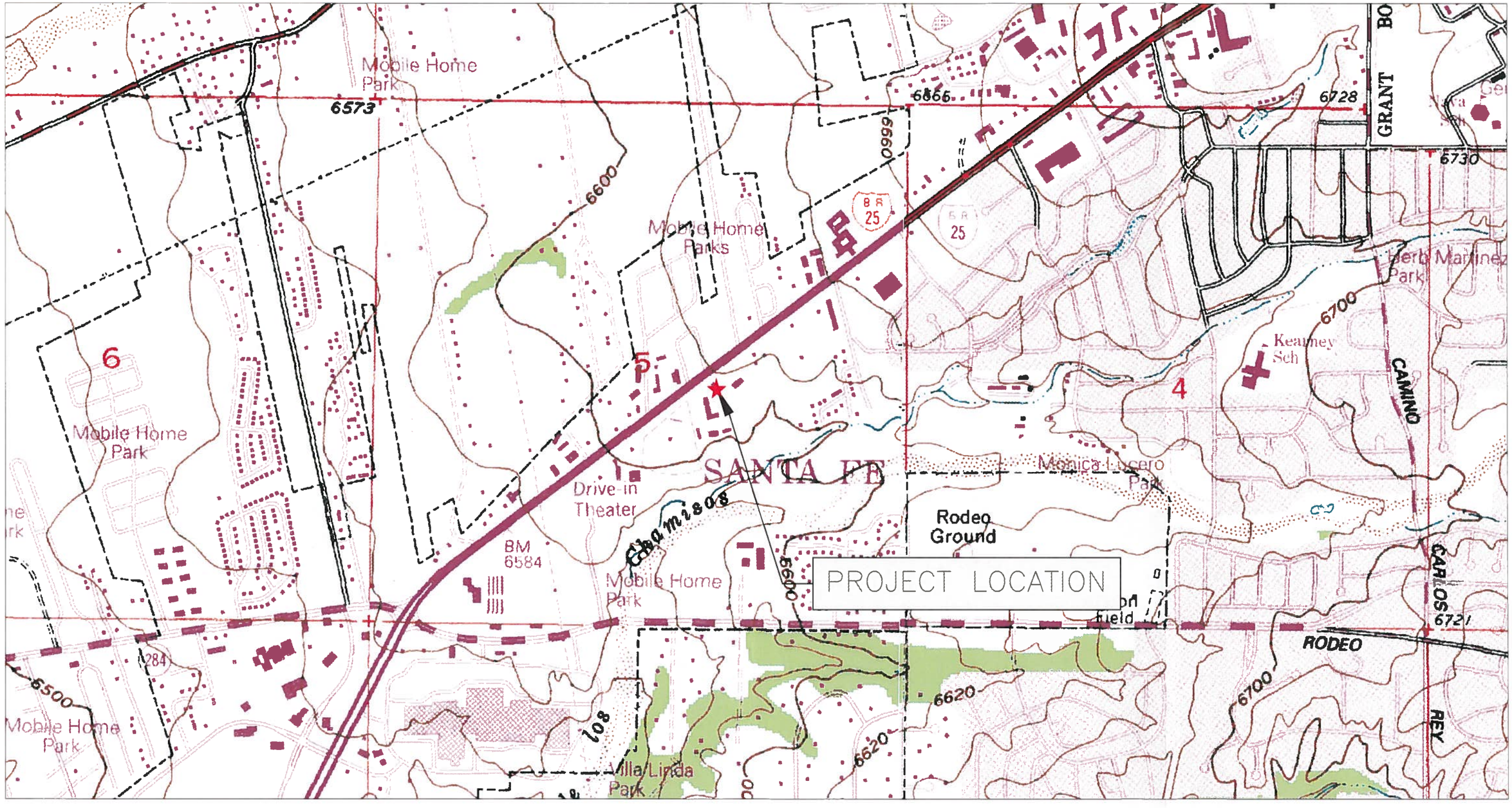
NM = Not Measured

Table 2
Ground Water Depth and Field Parameter Data

Well ID	Date Measured	Total Depth (feet)	Depth to Water (feet)	pH	Specific Conduct-ance (mS/cm)	Total Dissolved Solids (ppm)	Dissolved Oxygen (mg/L)	Temper-ature (°F)
MW-1	16-Nov-07	94.72	79.76	7.47	1.402	911	1.43	60.8

Notes: mS/cm = millisiemens per centimeter
mg/L = milligrams per Liter
ppm = parts per million

FIGURES



AGUA FRIA QUADRANGLE
NEW MEXICO–SANTA FE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

AGUA FRIA, N.MEX.
1951
REVISED 1993

GN MN
0°37' 11 MILS
10 1/2° 187 MILS
UTM GRID AND 1993 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE: 1 in = 1000 ft
0 500 0 1000
CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

BASIN ENGINEERING, INC

Drawn by	Date	Checked by	Date
DGW	11/27/07	JEC	

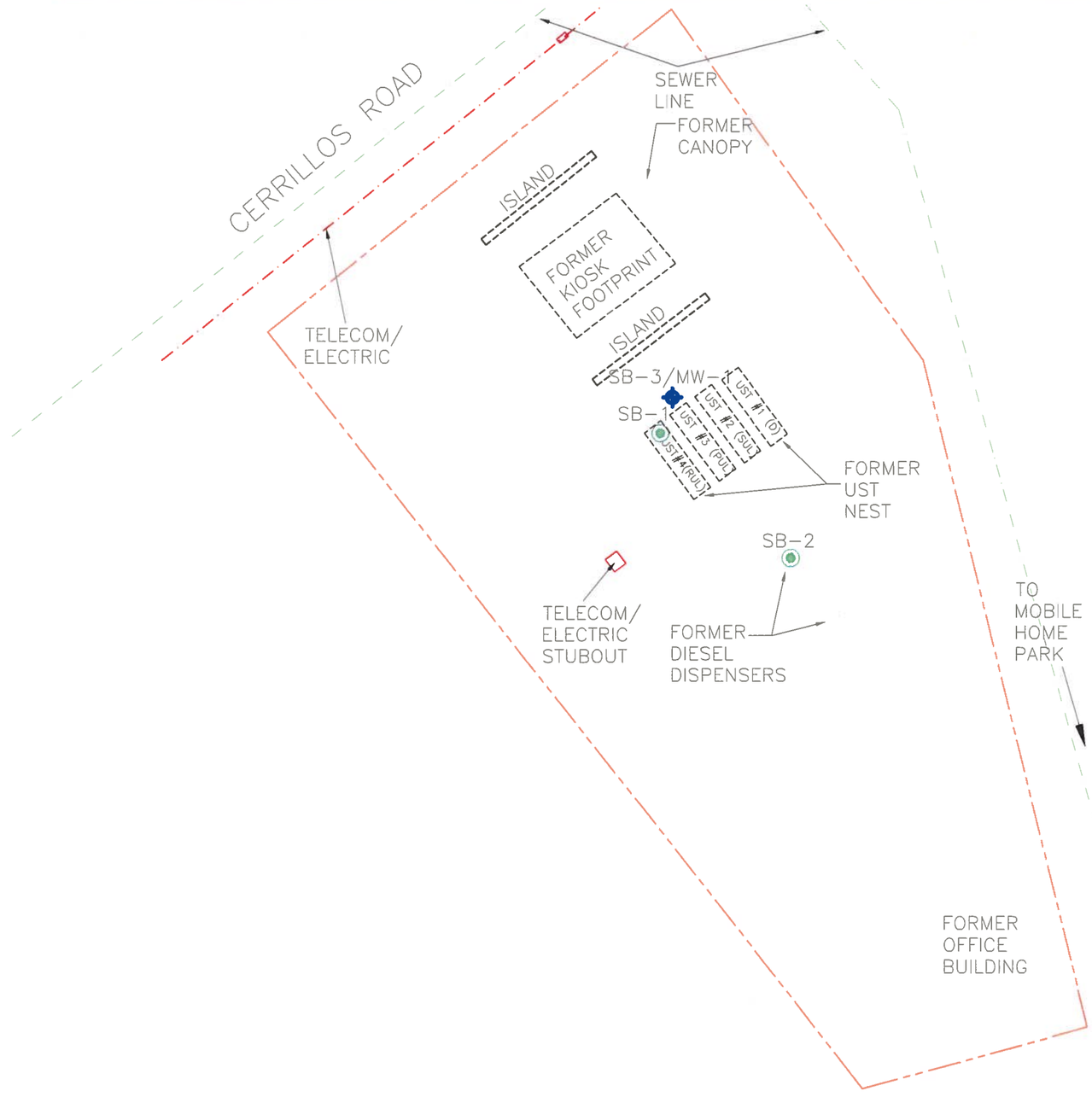
Vicinity Map

Continued Minimum Site Assessment Report
Santa Fe Shamrock #63
3624 Cerrillos Road
Santa Fe, New Mexico

Project No. 030116

Figure No. 1

d:\projects\0300\0301\16\Drawings\vicinity.dwg



LEGEND

SB-1 — Soil Boring Location And Designation

SB-3/MW-1 — Monitoring Well Location And Designation

Property Line

0 25 0 50

Scale: 1 in = 50 ft

N

BASIN ENGINEERING, INC

Drawn by	Date	Checked by	Date
DGW	11/27/07	JEC	

Site Map

Continued Minimum Site Assessment Report
Santa Fe Shamrock #63
3624 Cerrillos Road
Santa Fe, New Mexico

Project No. 030116

Figure No. 2

d:\projects\0300\0301\16\drawings\Site.dwg

Scale: 1" = 250'

0 125 0 250

N

B A S I N
ENGINEERING, INC

Drawn by	Date	Checked by	Date
DGW	11/27/07	JEC	

Land Use/Receptor Survey Map

Continued Minimum Site Assessment Report
Santa Fe Shamrock #63
3624 Cerrillos Road
Santa Fe, New Mexico

Project No. 030116

Figure No. 4,5

d:\projects\0300\0301\16\drawings\Adjacent Properties.dwg

Orthophoto provided by UNM–EDAC

Water well locations as indicated by NMOSE W.A.T.E.R.S.

0 250 0 500

Scale: 1 in = 500 ft

N

BASIN ENGINEERING, INC

Drawn by	Date	Checked by	Date
DGW	11/27/07	JEC	

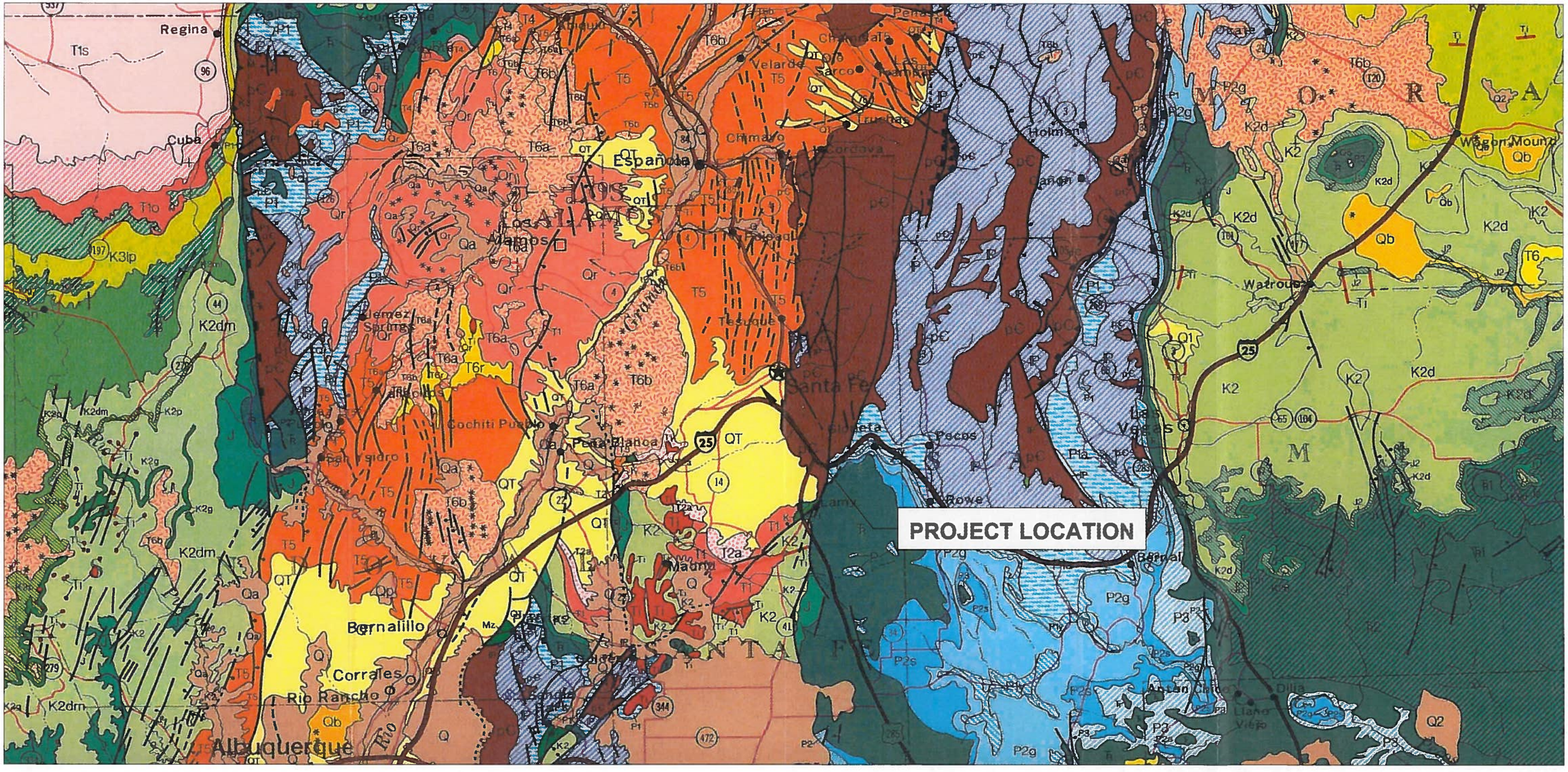
Well Locations

Continued Minimum Site Assessment Report
Santa Fe Shamrock #63
3624 Cerrillos Road
Santa Fe, New Mexico

Project No. 030116

Figure No. 6

d:\projects\0300\0301\16\drawings\Well Locations.dwg



NEW MEXICO HIGWAY GEOLOGIC MAP
NEW MEXICO GEOLOGICAL SOCIETY

1982

BASIN ENGINEERING, INC

Drawn by	Date	Checked by	Date
DGW	11/27/07	JEC	

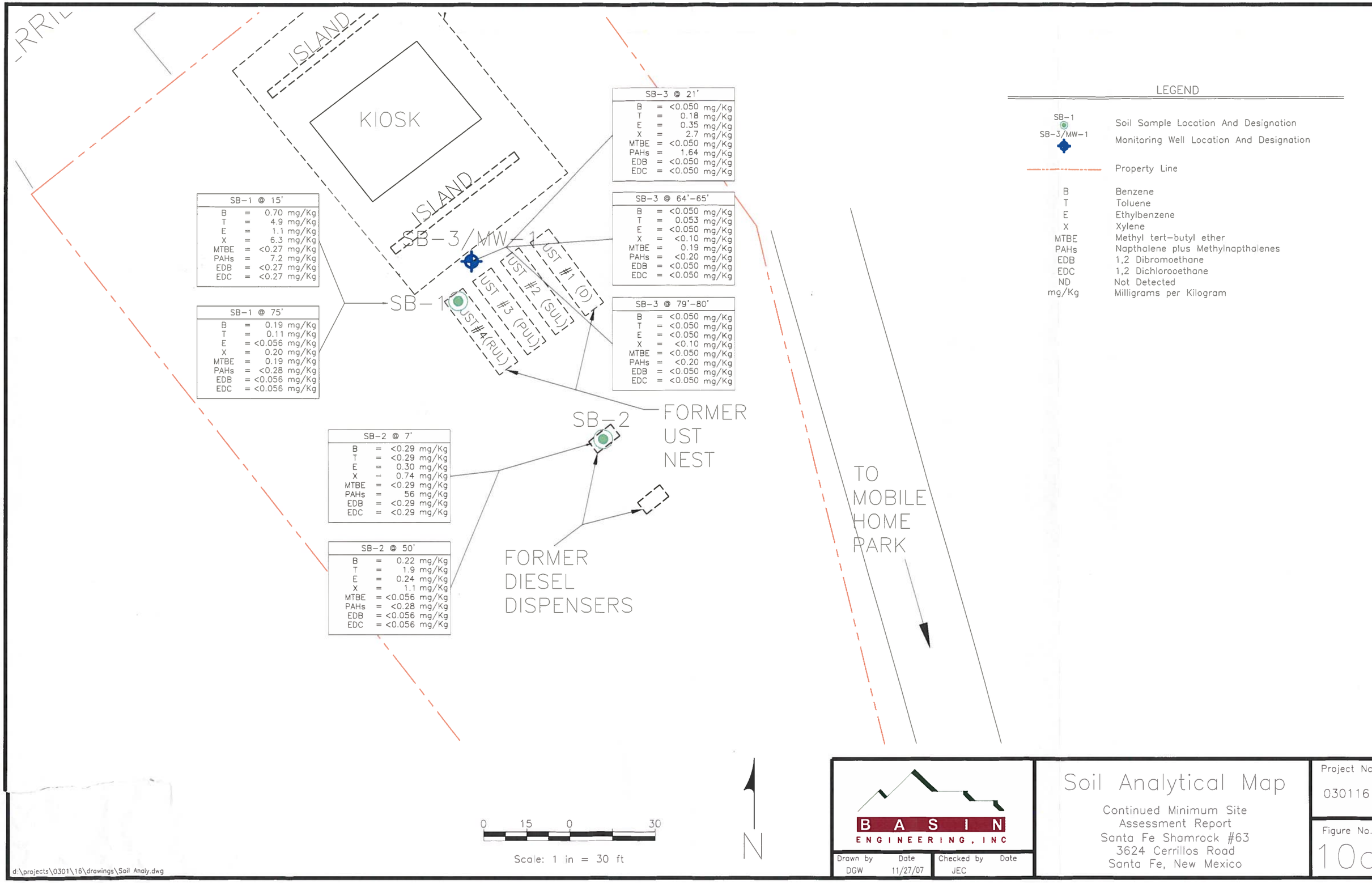
Geologic Map

Continued Minimum Site Assessment Report
Santa Fe Shamrock #63
3624 Cerrillos Road
Santa Fe, New Mexico

Project No.
030116

Figure No.
8

d:\projects\0300\0301\16\Drawings\geologic_map.dwg



LEGEND

SB-1	Soil Sample Location And Designation
SB-3/MW-1	Monitoring Well Location And Designation
	Property Line
B	Benzene
T	Toluene
E	Ethylbenzene
X	Xylene
MTBE	Methyl tert-butyl ether
PAHs	Napthalene plus Methylnapthalenes
EDB	1,2 Dibromoethane
EDC	1,2 Dichlorooethane
ND	Not Detected
mg/Kg	Milligrams per Kilogram

BASIN ENGINEERING, INC

Drawn by	Date	Checked by	Date
DGW	11/27/07	JEC	

Soil Analytical Map

Continued Minimum Site Assessment Report
Santa Fe Shamrock #63
3624 Cerrillos Road
Santa Fe, New Mexico

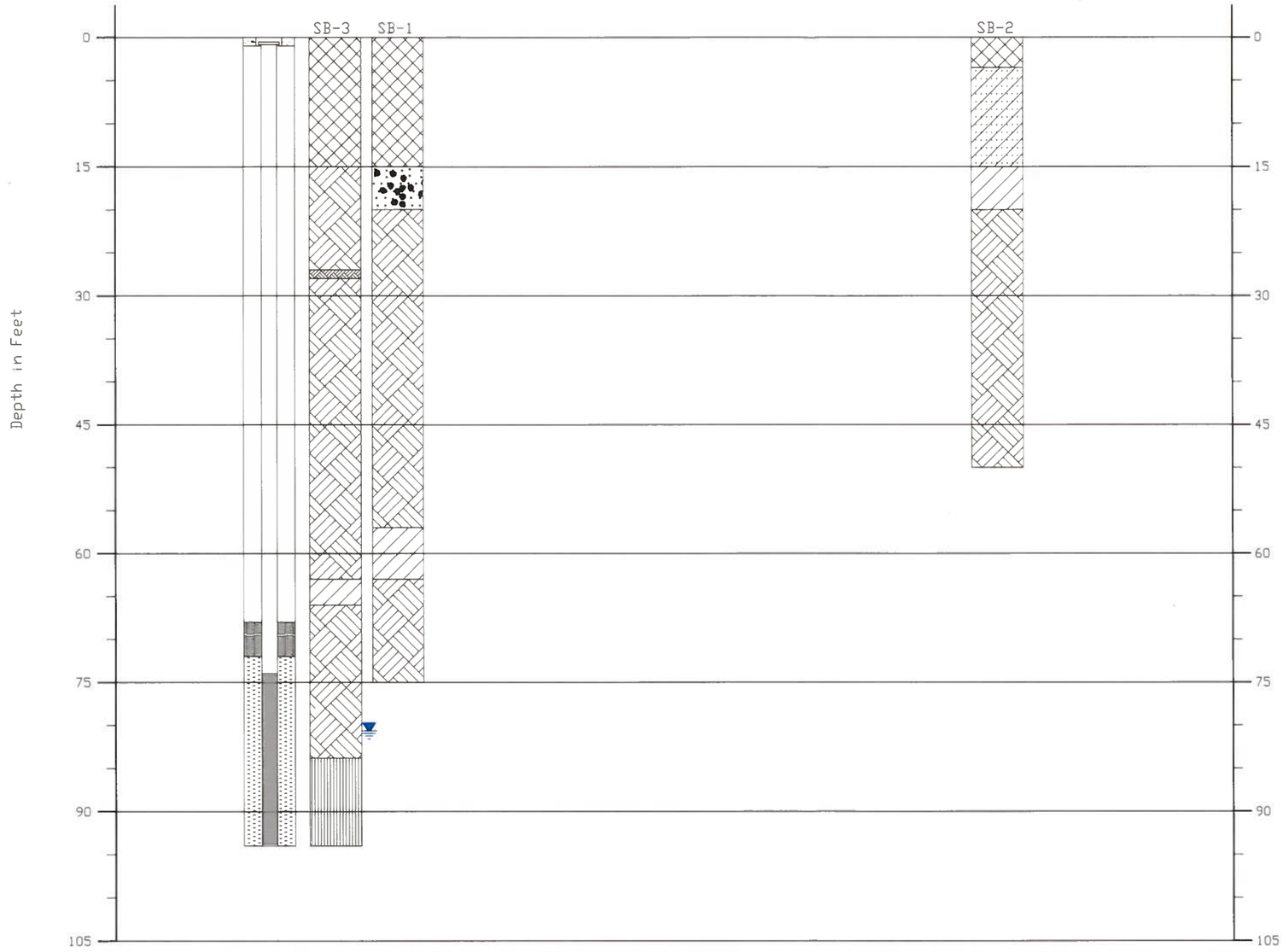
Project No. 030116

Figure No. 10a

d:\projects\0301\16\drawings\Soil Analy.dwg

LOG OF BORINGS

SHAMROCK #63



Strata symbols

- Fill
- Silty sand and gravel
- Basalt (or generic rock)
- Granite
- Poorly graded clayey silty sand
- Low plasticity clay
- Cobbles
- Silty sand

Scale: 1" = 15'

0 7.5 0 15

BASIN ENGINEERING, INC

Drawn by	Date	Checked by	Date
DGW	11/27/07	JEC	

Soil Boring Profile

Continued Minimum Site Assessment Report
Santa Fe Shamrock #63
3624 Cerrillos Road
Santa Fe, New Mexico

Project No. 030116

Figure No. 10b

d:\projects\0300\0301\16\drawings\SBProfile.dwg

APPENDIX A
Soil Boring Logs

MONITORING WELL LOG

BORING NO.: SB-3

PROJECT: Minimum Site Assessment Report
CLIENT: Polk Oil Company
LOCATION: Santa Fe Shamrock #63 3624 Cerrillos Rd Santa Fe NM
DRILLER: Rodgers
DRILLING METHOD: 4 1/4" Hollow Stem Auger
DEPTH TO WATER> **INITIAL:** 81.0 **AT COMPLETION:** 79.76

PROJECT NO.: 030116
DATE: 11/7/07
ELEVATION:
LOGGED BY: JEC

DEPTH	Description	ODOR	SOIL TYPE	USCS	SAMPLES	PID (ppm)	WELL DIAGRAM	Well Description	DEPTH
0	Fill in Old Tank Nest, Silty Sand, Brown, Moist, Loose, No Odor, No Samples in Fill	None		FILL				Flush Mount Cover	0
14.3	Decomposed Granite, Brown to Pink, Dense, Dry, Gasoline Odor	Gasoline		SM		106			14.3
		Gasoline				9870			
	Very Hard, Drilled Though 1' Rock					1840			
28.6	Decomposed Granite, Brown to Pink, Dense, Dry, Gasoline Odor	Gasoline		SM					28.6
	Decomposed Granite, Dry, Brown to Pink, Dense to Very Dense, Slightly Moist, Gasoline Odor	Gasoline		SM		715			
						89			
42.9						121			42.9
						42			
	Decomposed Granite, Brown to Pink, Trace Clay, Dry, Occasional Gravels, Gasoline Odor	Gasoline				67			
57.2						113			57.2
						28			
	Clay Content Increases; Soft for 2 1/2'	Strong Gasoline				527			
	Decomposed Granite, Brown to Pink, Hard to Very Hard, Dry, Gasoline Odor	Slight Gasoline Odor		SM		239		Bentonite Seal	
71.5									71.5
						89		#10-20 Silica Sand Filter Pack	
								2" #10 Slotted PVC Screen	
						76			
85.8	Medium Grained Sand, Saturated, Light Brown, Dense, No Odor	None		SM		52			85.8
	TD - 94'							TD - 94'	

All identification based on visual-manual procedures.

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

BASIN ENGINEERING, INC

APPENDIX B
Laboratory Analytical Reports

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

COVER LETTER

Tuesday, November 27, 2007

John Casey
Basin Engineering, Inc.
248 Bodo Drive
Durango, CO 81302

TEL: (970) 259-2078
FAX (970) 385-4812

RE: Shamrock #63

Order No.: 0711301

Dear John Casey:

Hall Environmental Analysis Laboratory, Inc. received 5 sample(s) on 11/16/2007 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

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

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

Sincerely,

Andy Freeman, Business Manager
Nancy McDuffie, Laboratory Manager

NM Lab # NM9425
AZ license # AZ0682
ORELAP Lab # NM100001

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

Hall Environmental Analysis Laboratory, Inc.

Date: *27-Nov-07*

CLIENT: Basin Engineering, Inc.
Project: Shamrock #63
Lab Order: 0711301

Lab ID: 0711301-01
Collection Date: 11/7/2007 12:00:00 PM
Client Sample ID: SB-3 @ 52-53'
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
TOC BY WALKLEY BLACK						Analyst: **KS**
TOC	ND	0.13		% C	1	11/20/2007

Lab ID: 0711301-02
Collection Date: 11/7/2007 11:10:00 AM
Client Sample ID: SB-3 @ 34-35'
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
TOC BY WALKLEY BLACK						Analyst: **KS**
TOC	ND	0.13		% C	1	11/20/2007

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	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Summary of Tests Performed

Laboratory Sample Number	Initial Soil Properties[1] (θ, ρ_d, ϕ)	Saturated Hydraulic Conductivity[2]		Moisture Characteristics[3]					Unsaturated Hydraulic Conductivity	Particle Size[4]			Effective Porosity	Particle Density	Air Permeability	1/3, 15 Bar Points and Water Holding Capacity	Atterberg Limits	Proctor Compaction
		CH	FH	HC	PP	TH	WP	RH		DS	WS	H						
0711301-03A										X								
0711301-04A										X								
0711301-05A										X								

[1] θ = Initial moisture content, ρ_d = Dry bulk density, ϕ = Calculated porosity
[2] CH = Constant head, FH = falling head
[3] HC = Hanging column, PP = Pressure plate, TH = Thermocouple psychrometer, WP = Water activity meter, RH = Relative humidity box
[4] DS = Dry sieve, WS = Wet sieve, H = Hydrometer

Summary of Particle Size Characteristics

Sample Number	d_{10} (mm)	d_{50} (mm)	d_{60} (mm)	C_u	C_c	Method	ASTM Classification	USDA Classification	
0711301-03A	0.031	0.31	0.38	12	2.5	DS	Classification by ASTM 2487 requires Atterberg test	Loamy Sand †	(Est)
0711301-04A	0.017	0.42	0.81	48	0.88	DS	Classification by ASTM 2487 requires Atterberg test	Loamy Sand †	(Est)
0711301-05A	0.019	0.83	1.6	84	0.95	DS	Classification by ASTM 2487 requires Atterberg test	Loamy Sand †	(Est)

d_{50} = Median particle diameter

Est = Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material

Particle Size Analysis
Dry Sieve Data

Job Name: Hall Environmental Analysis Laboratory
Job Number: LB07.0237.00
Sample Number: 0711301-03A
Sample ID: SB-3 @ 21-27'
Date/Time Collected: 11/7/07 1030

Test Date: 20-Nov-07

Shape: Angular
Hardness: Hard and durable

Total Sample Weight (g): 796.78

Sieve Number	Diameter (mm)	Wt. Retained (g)	Cum Wt. Retained (g)	Wt. Passing (g)	% Passing
3"	75	0.00	0.00	796.78	100.00
2"	50	0.00	0.00	796.78	100.00
1.5"	38.1	0.00	0.00	796.78	100.00
1"	25	0.00	0.00	796.78	100.00
3/4"	19.0	10.30	10.30	786.48	98.71
3/8"	9.5	41.43	51.73	745.05	93.51
4	4.75	19.94	71.67	725.11	91.01
10	2.00	32.95	104.62	692.16	86.87
20	0.85	47.49	152.11	644.67	80.91
40	0.425	123.08	275.19	521.59	65.46
60	0.250	217.25	492.44	304.34	38.20
140	0.106	145.20	637.64	159.14	19.97
200	0.075	22.60	660.24	136.54	17.14
pan		137.61	797.85	- 1.07	

d_{10} (mm): 0.031
d_{16} (mm): 0.065
d_{30} (mm): 0.17
d_{50} (mm): 0.31
d_{60} (mm): 0.38
d_{84} (mm): 1.3

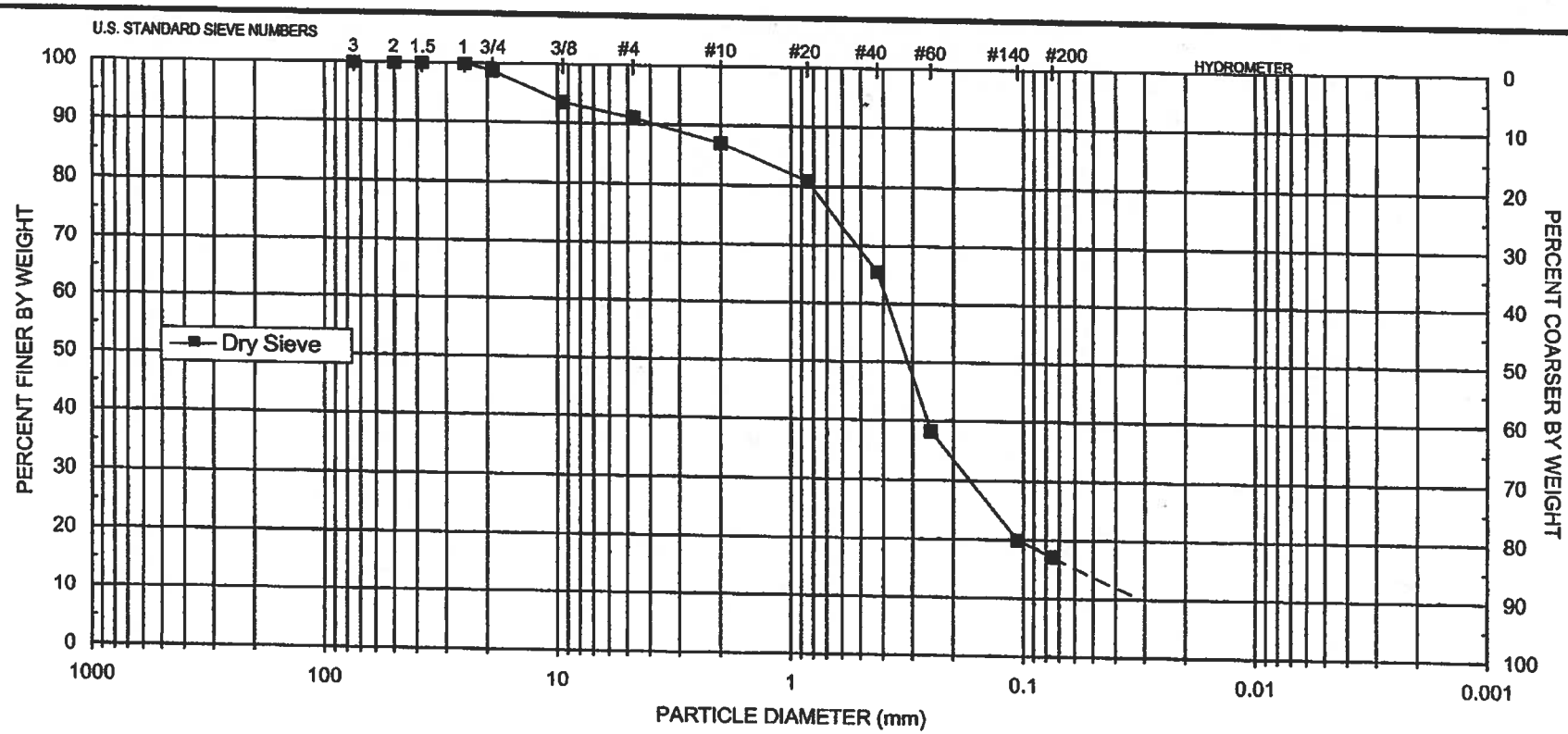
Median Particle Diameter--d_{50} (mm): 0.31
Uniformity Coefficient, Cu--$[d_{60}/d_{10}]$ (mm): 12
Coefficient of Curvature, Cc--$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 2.5
Mean Particle Diameter--$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.56

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

ASTM Soil Classification: Classification by ASTM 2487 requires Atterberg test
USDA Soil Classification: Loamy Sand †

† Greater than 10% of sample is coarse material

Laboratory analysis by: T. Bowekaty
Data entered by: T. Bowekaty
Checked by: J. Hines



d_{10} = 0.031	d_{30} = 0.17	d_{50} = 0.31	d_{60} = 0.38	C_u = 12	C_c = 2.5

SAMPLE NUMBER	DATE/TIME COLLECTED	ASTM CLASSIFICATION	USDA CLASSIFICATION
0711301-03A	11/7/07 1030	Classification by ASTM 2487 requires Atterberg test	Loamy Sand †

† Greater than 10% of sample is coarse material

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Particle Size Analysis
Dry Sieve Data

Job Name: Hall Environmental Analysis Laboratory
Job Number: LB07.0237.00
Sample Number: 0711301-04A
Sample ID: SB-3 @ 52-58'
Date/Time Collected: 11/7/07 1230

Test Date: 20-Nov-07

Shape: Angular
Hardness: Hard and durable

Total Sample Weight (g): 834.08

Sieve Number	Diameter (mm)	Wt. Retained (g)	Cum Wt. Retained (g)	Wt. Passing (g)	% Passing
3"	75	0.00	0.00	834.08	100.00
2"	50	0.00	0.00	834.08	100.00
1.5"	38.1	0.00	0.00	834.08	100.00
1"	25	45.32	45.32	788.76	94.57
3/4"	19.0	8.97	54.29	779.79	93.49
3/8"	9.5	70.67	124.96	709.12	85.02
4	4.75	50.25	175.21	658.87	78.99
10	2.00	63.88	239.09	594.99	71.33
20	0.85	88.45	327.54	506.54	60.73
40	0.425	89.02	416.56	417.52	50.06
60	0.250	72.65	489.21	344.87	41.35
140	0.106	101.97	591.18	242.90	29.12
200	0.075	29.89	621.07	213.01	25.54
pan		212.99	834.06	0.02	

d_{10} (mm): 0.017
d_{16} (mm): 0.030
d_{30} (mm): 0.11
d_{50} (mm): 0.42
d_{60} (mm): 0.81
d_{84} (mm): 8.4

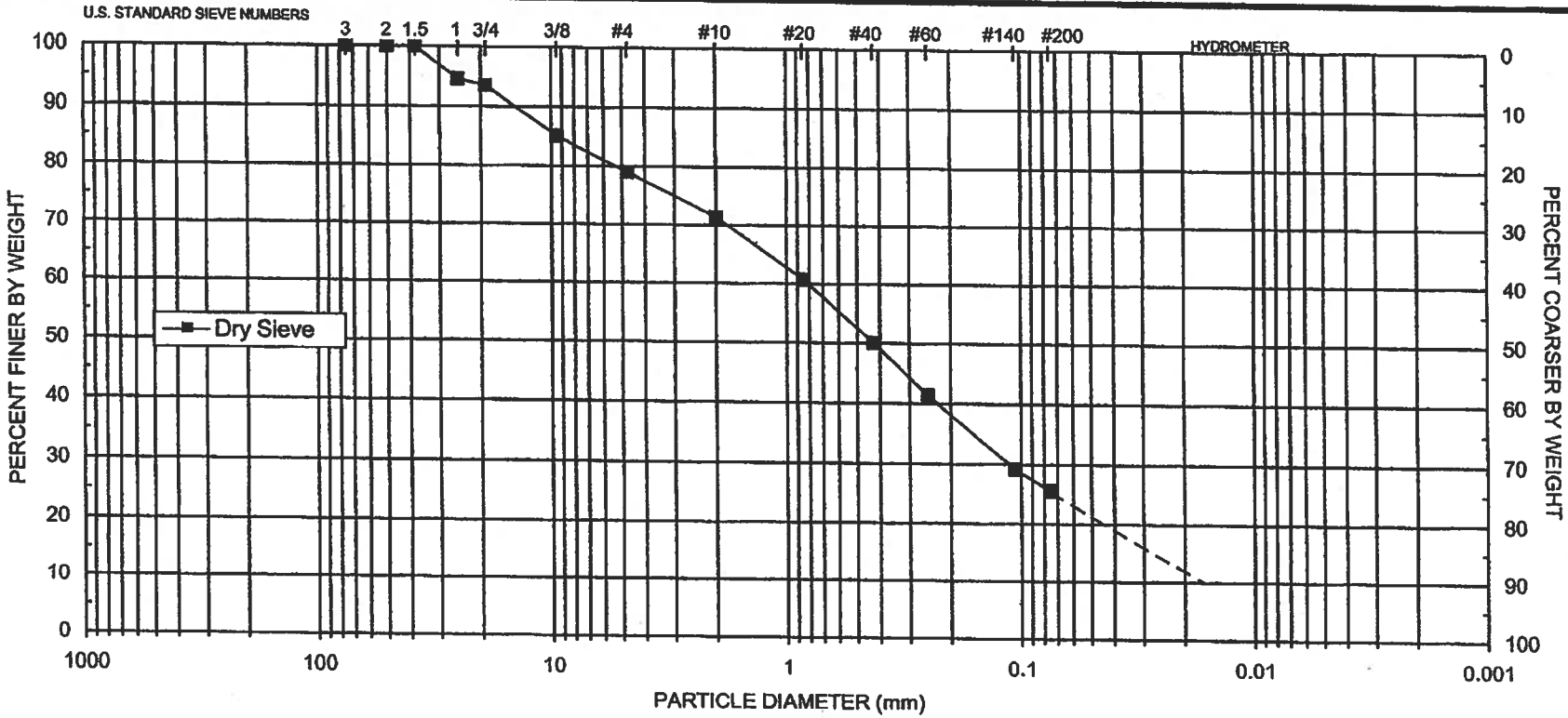
Median Particle Diameter–d_{50} (mm): 0.42
Uniformity Coefficient, Cu–$[d_{60}/d_{10}]$ (mm): 48
Coefficient of Curvature, Cc–$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 0.88
Mean Particle Diameter–$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 3.0

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

ASTM Soil Classification: Classification by ASTM 2487 requires Atterberg test
USDA Soil Classification: Loamy Sand †

† Greater than 10% of sample is coarse material

Laboratory analysis by: T. Bowekaty
Data entered by: T. Bowekaty
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = 0.017	d_{30} = 0.11	d_{50} = 0.42	d_{60} = 0.81	C_u = 48	C_c = 0.88
SAMPLE NUMBER	DATE/TIME COLLECTED	ASTM CLASSIFICATION		USDA CLASSIFICATION	
0711301-04A	11/7/07 1230	Classification by ASTM 2487 requires Atterberg test		Loamy Sand †	

† Greater than 10% of sample is coarse material

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Particle Size Analysis
Dry Sieve Data

Job Name: Hall Environmental Analysis Laboratory
Job Number: LB07.0237.00
Sample Number: 0711301-05A
Sample ID: SB-3 @ 34-43'
Date/Time Collected: 11/7/07 1130

Test Date: 20-Nov-07

Shape: Angular
Hardness: Hard and durable

Total Sample Weight (g): 1332.88

Sieve Number	Diameter (mm)	Wt. Retained (g)	Cum Wt. Retained (g)	Wt. Passing (g)	% Passing
3"	75	0.00	0.00	1332.88	100.00
2"	50	0.00	0.00	1332.88	100.00
1.5"	38.1	0.00	0.00	1332.88	100.00
1"	25	59.35	59.35	1273.53	95.55
3/4"	19.0	14.82	74.17	1258.71	94.44
3/8"	9.5	115.21	189.38	1143.50	85.79
4	4.75	130.85	320.23	1012.65	75.97
10	2.00	170.96	491.19	841.69	63.15
20	0.85	170.69	661.88	671.00	50.34
40	0.425	128.22	790.10	542.78	40.72
60	0.250	89.10	879.20	453.68	34.04
140	0.106	126.54	1005.74	327.14	24.54
200	0.075	38.95	1044.69	288.19	21.62
pan		287.99	1332.68	0.20	

d_{10} (mm): 0.019
d_{16} (mm): 0.039
d_{30} (mm): 0.17
d_{50} (mm): 0.83
d_{60} (mm): 1.6
d_{84} (mm): 8.4

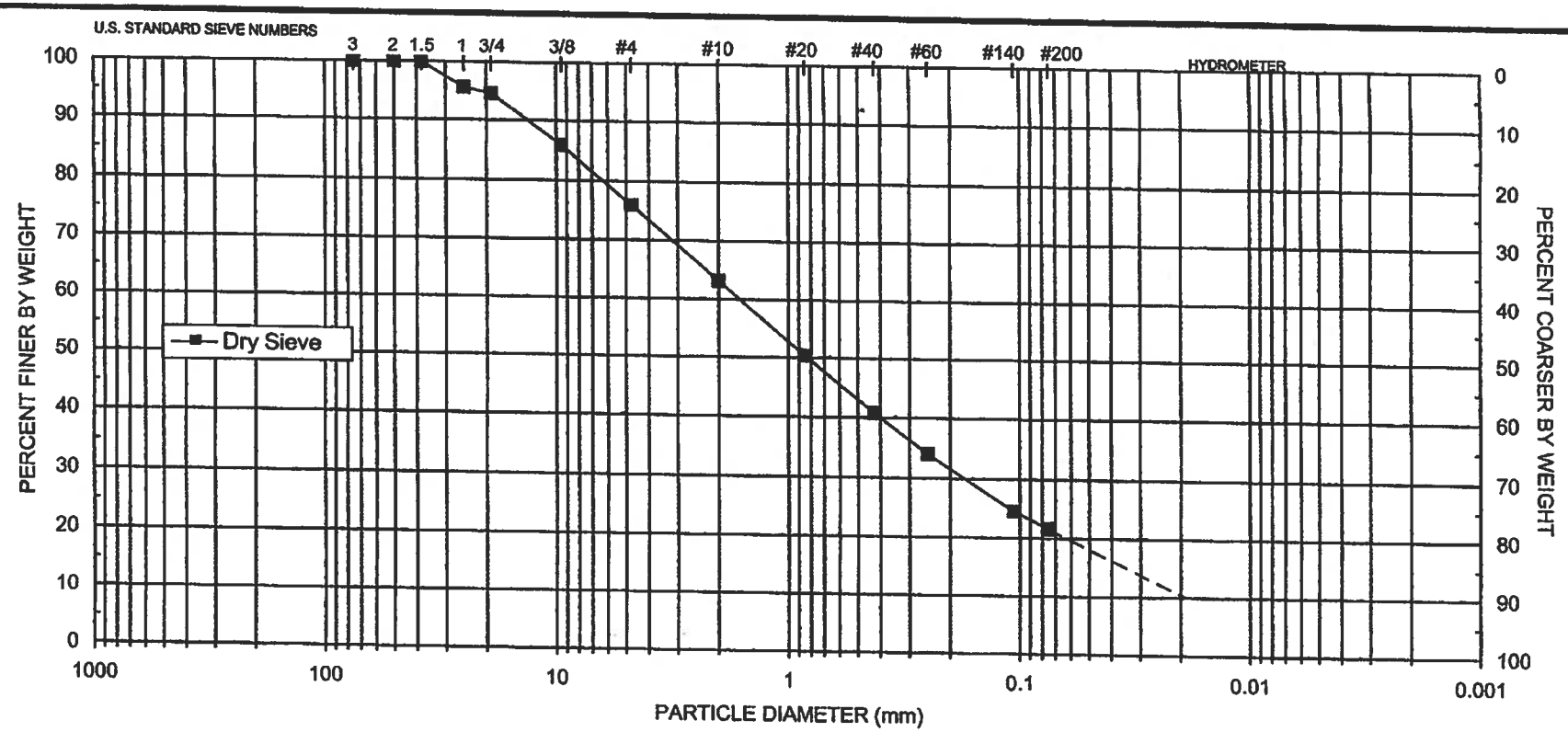
Median Particle Diameter--d_{50} (mm): 0.83
Uniformity Coefficient, Cu--$[d_{60}/d_{10}]$ (mm): 84
Coefficient of Curvature, Cc--$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 0.95
Mean Particle Diameter--$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 3.1

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

ASTM Soil Classification: Classification by ASTM 2487 requires Atterberg test
USDA Soil Classification: Loamy Sand †

† Greater than 10% of sample is coarse material

Laboratory analysis by: T. Bowekaty
Data entered by: T. Bowekaty
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY			
		Coarse	Fine	Coarse	Medium	Fine				
USDA	COBBLES	GRAVEL		SAND				SILT	CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine		

d_{10} = 0.019	d_{30} = 0.17	d_{50} = 0.83	d_{60} = 1.6	C_u = 84	C_c = 0.95

SAMPLE NUMBER	DATE/TIME COLLECTED	ASTM CLASSIFICATION	USDA CLASSIFICATION
0711301-05A	11/7/07 1130	Classification by ASTM 2487 requires Atterberg test	Loamy Sand †

† Greater than 10% of sample is coarse material

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Laboratory Tests and Methods

Tests and Methods

Particle Size Analysis:	ASTM D422

Summary of Tests Performed

Laboratory Sample Number	Initial Soil Properties[1] (θ, ρ_d, ϕ)	Saturated Hydraulic Conductivity[2]		Moisture Characteristics[3]					Unsaturated Hydraulic Conductivity	Particle Size[4]			Effective Porosity	Particle Density	Air Permeability	1/3, 15 Bar Points and Water Holding Capacity	Atterberg Limits	Proctor Compaction
		CH	FH	HC	PP	TH	WP	RH		DS	WS	H						
0711301-03A										X								
0711301-04A										X								
0711301-05A										X								

[1] θ = Initial moisture content, ρ_d = Dry bulk density, ϕ = Calculated porosity

[2] CH = Constant head, FH = falling head

[3] HC = Hanging column, PP = Pressure plate, TH = Thermocouple psychrometer, WP = Water activity meter, RH = Relative humidity box

[4] DS = Dry sieve, WS = Wet sieve, H = Hydrometer

Summary of Particle Size Characteristics

Sample Number	d_{10} (mm)	d_{50} (mm)	d_{60} (mm)	C_u	C_c	Method	ASTM Classification	USDA Classification	
0711301-03A	0.031	0.31	0.38	12	2.5	DS	Classification by ASTM 2487 requires Atterberg test	Loamy Sand †	(Est)
0711301-04A	0.017	0.42	0.81	48	0.88	DS	Classification by ASTM 2487 requires Atterberg test	Loamy Sand †	(Est)
0711301-05A	0.019	0.83	1.6	84	0.95	DS	Classification by ASTM 2487 requires Atterberg test	Loamy Sand †	(Est)

d_{50} = Median particle diameter

Est = Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material

QA/QC SUMMARY REPORT

Client: Basin Engineering, Inc.
Project: Shamrock #63 **Work Order:** 0711301

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: TOC by Walkley Black									
Sample ID: MB-14465		*MBLK*			Batch ID:	**14465**	Analysis Date:		11/20/2007
TOC	ND	% C	0.13						
Sample ID: LCS-14465		*LCS*			Batch ID:	**14465**	Analysis Date:		11/20/2007
TOC	2.890	% C	0.13	105	80	120			

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name **BASIN DURANGO** Date Received: **11/19/2007**

Work Order Number **0711301** Received by: AT

Checklist completed by: _____ 11/19/07 Sample ID labels checked by TS
Signature Date Initials

Matrix Carrier name Client drop-off

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☐	Not Shipped ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	N/A ☑	
Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☑	No ☐		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
All samples received within holding time?	Yes ☑	No ☐		
Water - VOA vials have zero headspace? No VOA vials submitted	☑	Yes ☐	No ☐	
Water - Preservation labels on bottle and cap match?	Yes ☐	No ☐	N/A ☑	
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑	
Container/Temp Blank temperature?	**20°**	*<6° C Acceptable* If given sufficient time to cool.		

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding _____

Comments: _____

Corrective Action _____

CHAIN-OF-CUSTODY RECORD

QA / QC Package:
Std ☐ Level 4 ☐
Other: _____

Client: Basin Engineering
Address: PO Box 3909
Durango, CO 81302
Phone #: 970 259 2078
Fax #: 970 385 4812

Project Name: Shamrock #63
Project #: 0301-16
Project Manager: John Casey
Sampler: [signature]
Sample Temperature: on ice 20°

HALL ENVIRONMENTAL ANALYSIS LABORATORY
4901 Hawkins NE, Suite D
Albuquerque, New Mexico 87109
Tel. 505.345.3975 Fax 505.345.4107
www.hallenvironmental.com

ANALYSIS REQUEST

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative $HgCl_2$	Preservative HNO_3	HEAL No. 0711301
11-7-07	12:20	Soil	SB-3@52-53	1-4oz			-1
11-7-07	11:10	Soil	SB-3@34-35'	1-4oz			-2
11-7-07	10:30	Soil	SB3@21 to 27'	1 bag			-3
11-7-07	12:30	Soil	SB-3@52 to 58'	1 bag			-4
11-7-07	11:30	Soil	SB-3@34-43'	1 bag			-5

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	EDC (Method 8021)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F, Cl, NO_3, NO_2, PO_4, SO_4)	8081 Pesticides / PCB's (8082)	8260B (VOA)	8270 (Semi-VOA)	Organic Carbon	Steve Analyses			Air Bubbles or Headspace (Y or N)
												X				
												X				
													X			
													X			
													X			

Date	Time	Relinquished By: (Signature)	Received By: (Signature)
11/6/07	14:30	[signature]	[signature]
			11/16/07 1430

Remarks:

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

COVER LETTER

Wednesday, November 28, 2007

John Casey
Basin Engineering, Inc.
248 Bodo Drive
Durango, CO 81302

TEL: (970) 259-2078
FAX (970) 385-4812

RE: Shamrock #63

Order No.: 0711133

Dear John Casey:

Hall Environmental Analysis Laboratory, Inc. received 3 sample(s) on 11/8/2007 for the analyses presented in the following report.

This report is an addendum to the report dated November 14, 2007. EPA Method 8310 and TOC have been added to all samples.

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

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

Sincerely,

Andy Freeman, Business Manager
Nancy McDuffie, Laboratory Manager

Hall Environmental Analysis Laboratory, Inc.

Date: *28-Nov-07*

CLIENT:	Basin Engineering, Inc.	**Client Sample ID:**	SB-3 @ 21'
Lab Order:	0711133	**Collection Date:**	11/7/2007 10:25:00 AM
Project:	Shamrock #63	**Date Received:**	11/8/2007
Lab ID:	0711133-01	**Matrix:**	MEOH (SOIL)

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8310: PAHS						Analyst: **JMP**
Naphthalene	ND	0.25		mg/Kg	1	11/27/2007 9:16:08 PM
1-Methylnaphthalene	ND	0.25		mg/Kg	1	11/27/2007 9:16:08 PM
2-Methylnaphthalene	ND	0.25		mg/Kg	1	11/27/2007 9:16:08 PM
Acenaphthylene	ND	0.25		mg/Kg	1	11/27/2007 9:16:08 PM
Acenaphthene	ND	0.25		mg/Kg	1	11/27/2007 9:16:08 PM
Fluorene	ND	0.030		mg/Kg	1	11/27/2007 9:16:08 PM
Phenanthrene	0.036	0.015		mg/Kg	1	11/27/2007 9:16:08 PM
Anthracene	ND	0.015		mg/Kg	1	11/27/2007 9:16:08 PM
Fluoranthene	ND	0.020		mg/Kg	1	11/27/2007 9:16:08 PM
Pyrene	ND	0.025		mg/Kg	1	11/27/2007 9:16:08 PM
Benz(a)anthracene	ND	0.0020		mg/Kg	1	11/27/2007 9:16:08 PM
Chrysene	0.011	0.011		mg/Kg	1	11/27/2007 9:16:08 PM
Benzo(b)fluoranthene	ND	0.0040		mg/Kg	1	11/27/2007 9:16:08 PM
Benzo(k)fluoranthene	ND	0.0010		mg/Kg	1	11/27/2007 9:16:08 PM
Benzo(a)pyrene	ND	0.0010		mg/Kg	1	11/27/2007 9:16:08 PM
Dibenz(a,h)anthracene	ND	0.0030		mg/Kg	1	11/27/2007 9:16:08 PM
Benzo(g,h,i)perylene	ND	0.0030		mg/Kg	1	11/27/2007 9:16:08 PM
Indeno(1,2,3-cd)pyrene	ND	0.0040		mg/Kg	1	11/27/2007 9:16:08 PM
Surr: Benzo(e)pyrene	95.9	52.8-123		%REC	1	11/27/2007 9:16:08 PM
EPA METHOD 8260B: VOLATILES						Analyst: **LMM**
Benzene	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
Toluene	0.18	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
Ethylbenzene	0.35	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
Methyl tert-butyl ether (MTBE)	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
1,2,4-Trimethylbenzene	2.6	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
1,3,5-Trimethylbenzene	0.84	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
1,2-Dichloroethane (EDC)	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
1,2-Dibromoethane (EDB)	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
Naphthalene	0.46	0.10		mg/Kg	1	11/12/2007 4:52:28 PM
1-Methylnaphthalene	0.42	0.20		mg/Kg	1	11/12/2007 4:52:28 PM
2-Methylnaphthalene	0.76	0.20		mg/Kg	1	11/12/2007 4:52:28 PM
Acetone	ND	0.75		mg/Kg	1	11/12/2007 4:52:28 PM
Bromobenzene	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
Bromochloromethane	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
Bromodichloromethane	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
Bromoform	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
Bromomethane	ND	0.10		mg/Kg	1	11/12/2007 4:52:28 PM
2-Butanone	ND	0.50		mg/Kg	1	11/12/2007 4:52:28 PM
Carbon disulfide	ND	0.50		mg/Kg	1	11/12/2007 4:52:28 PM
Carbon tetrachloride	ND	0.10		mg/Kg	1	11/12/2007 4:52:28 PM
Chlorobenzene	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

Date: *28-Nov-07*

CLIENT:	Basin Engineering, Inc.	**Client Sample ID:**	SB-3 @ 21'
Lab Order:	0711133	**Collection Date:**	11/7/2007 10:25:00 AM
Project:	Shamrock #63	**Date Received:**	11/8/2007
Lab ID:	0711133-01	**Matrix:**	MEOH (SOIL)

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **LMM**
Chloroethane	ND	0.10		mg/Kg	1	11/12/2007 4:52:28 PM
Chloroform	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
Chloromethane	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
2-Chlorotoluene	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
4-Chlorotoluene	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
cis-1,2-DCE	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
cis-1,3-Dichloropropene	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
1,2-Dibromo-3-chloropropane	ND	0.10		mg/Kg	1	11/12/2007 4:52:28 PM
Dibromochloromethane	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
Dibromomethane	ND	0.10		mg/Kg	1	11/12/2007 4:52:28 PM
1,2-Dichlorobenzene	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
1,3-Dichlorobenzene	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
1,4-Dichlorobenzene	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
Dichlorodifluoromethane	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
1,1-Dichloroethane	ND	0.10		mg/Kg	1	11/12/2007 4:52:28 PM
1,1-Dichloroethene	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
1,2-Dichloropropane	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
1,3-Dichloropropane	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
2,2-Dichloropropane	ND	0.10		mg/Kg	1	11/12/2007 4:52:28 PM
1,1-Dichloropropene	ND	0.10		mg/Kg	1	11/12/2007 4:52:28 PM
Hexachlorobutadiene	ND	0.10		mg/Kg	1	11/12/2007 4:52:28 PM
2-Hexanone	ND	0.50		mg/Kg	1	11/12/2007 4:52:28 PM
Isopropylbenzene	0.10	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
4-Isopropyltoluene	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
4-Methyl-2-pentanone	ND	0.50		mg/Kg	1	11/12/2007 4:52:28 PM
Methylene chloride	ND	0.15		mg/Kg	1	11/12/2007 4:52:28 PM
n-Butylbenzene	0.62	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
n-Propylbenzene	0.40	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
sec-Butylbenzene	0.11	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
Styrene	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
tert-Butylbenzene	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
1,1,1,2-Tetrachloroethane	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
1,1,2,2-Tetrachloroethane	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
Tetrachloroethene (PCE)	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
trans-1,2-DCE	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
trans-1,3-Dichloropropene	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
1,2,3-Trichlorobenzene	ND	0.10		mg/Kg	1	11/12/2007 4:52:28 PM
1,2,4-Trichlorobenzene	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
1,1,1-Trichloroethane	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
1,1,2-Trichloroethane	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
Trichloroethene (TCE)	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
Trichlorofluoromethane	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

Date: *28-Nov-07*

CLIENT:	Basin Engineering, Inc.	**Client Sample ID:**	SB-3 @ 21'
Lab Order:	0711133	**Collection Date:**	11/7/2007 10:25:00 AM
Project:	Shamrock #63	**Date Received:**	11/8/2007
Lab ID:	0711133-01	**Matrix:**	MEOH (SOIL)

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **LMM**
1,2,3-Trichloropropane	ND	0.10		mg/Kg	1	11/12/2007 4:52:28 PM
Vinyl chloride	ND	0.050		mg/Kg	1	11/12/2007 4:52:28 PM
Xylenes, Total	2.7	0.10		mg/Kg	1	11/12/2007 4:52:28 PM
Surr: 1,2-Dichloroethane-d4	98.7	68.7-122		%REC	1	11/12/2007 4:52:28 PM
Surr: 4-Bromofluorobenzene	98.0	79.3-126		%REC	1	11/12/2007 4:52:28 PM
Surr: Dibromofluoromethane	88.6	64.4-119		%REC	1	11/12/2007 4:52:28 PM
Surr: Toluene-d8	97.7	86.5-121		%REC	1	11/12/2007 4:52:28 PM
TOC BY WALKLEY BLACK						Analyst: **KS**
TOC	ND	0.13		% C	1	11/20/2007

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	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *28-Nov-07*

CLIENT:	Basin Engineering, Inc.	**Client Sample ID:**	SB-3 @ 64-65'
Lab Order:	0711133	**Collection Date:**	11/7/2007 2:00:00 PM
Project:	Shamrock #63	**Date Received:**	11/8/2007
Lab ID:	0711133-02	**Matrix:**	MEOH (SOIL)

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8310: PAHS						Analyst: **JMP**
Naphthalene	ND	0.25		mg/Kg	1	11/27/2007 10:04:07 PM
1-Methylnaphthalene	ND	0.25		mg/Kg	1	11/27/2007 10:04:07 PM
2-Methylnaphthalene	ND	0.25		mg/Kg	1	11/27/2007 10:04:07 PM
Acenaphthylene	ND	0.25		mg/Kg	1	11/27/2007 10:04:07 PM
Acenaphthene	ND	0.25		mg/Kg	1	11/27/2007 10:04:07 PM
Fluorene	ND	0.030		mg/Kg	1	11/27/2007 10:04:07 PM
Phenanthrene	ND	0.015		mg/Kg	1	11/27/2007 10:04:07 PM
Anthracene	ND	0.015		mg/Kg	1	11/27/2007 10:04:07 PM
Fluoranthene	ND	0.020		mg/Kg	1	11/27/2007 10:04:07 PM
Pyrene	ND	0.025		mg/Kg	1	11/27/2007 10:04:07 PM
Benz(a)anthracene	ND	0.0020		mg/Kg	1	11/27/2007 10:04:07 PM
Chrysene	ND	0.011		mg/Kg	1	11/27/2007 10:04:07 PM
Benzo(b)fluoranthene	ND	0.0040		mg/Kg	1	11/27/2007 10:04:07 PM
Benzo(k)fluoranthene	ND	0.0010		mg/Kg	1	11/27/2007 10:04:07 PM
Benzo(a)pyrene	ND	0.0010		mg/Kg	1	11/27/2007 10:04:07 PM
Dibenz(a,h)anthracene	ND	0.0030		mg/Kg	1	11/27/2007 10:04:07 PM
Benzo(g,h,i)perylene	ND	0.0030		mg/Kg	1	11/27/2007 10:04:07 PM
Indeno(1,2,3-cd)pyrene	ND	0.0040		mg/Kg	1	11/27/2007 10:04:07 PM
Surr: Benzo(e)pyrene	105	52.8-123		%REC	1	11/27/2007 10:04:07 PM
EPA METHOD 8260B: VOLATILES						Analyst: **LMM**
Benzene	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
Toluene	0.053	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
Ethylbenzene	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
Methyl tert-butyl ether (MTBE)	0.19	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
1,2,4-Trimethylbenzene	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
1,3,5-Trimethylbenzene	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
1,2-Dichloroethane (EDC)	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
1,2-Dibromoethane (EDB)	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
Naphthalene	ND	0.10		mg/Kg	1	11/11/2007 10:07:59 AM
1-Methylnaphthalene	ND	0.20		mg/Kg	1	11/11/2007 10:07:59 AM
2-Methylnaphthalene	ND	0.20		mg/Kg	1	11/11/2007 10:07:59 AM
Acetone	ND	0.75		mg/Kg	1	11/11/2007 10:07:59 AM
Bromobenzene	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
Bromochloromethane	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
Bromodichloromethane	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
Bromoform	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
Bromomethane	ND	0.10		mg/Kg	1	11/11/2007 10:07:59 AM
2-Butanone	ND	0.50		mg/Kg	1	11/11/2007 10:07:59 AM
Carbon disulfide	ND	0.50		mg/Kg	1	11/11/2007 10:07:59 AM
Carbon tetrachloride	ND	0.10		mg/Kg	1	11/11/2007 10:07:59 AM
Chlorobenzene	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

Date: *28-Nov-07*

CLIENT:	Basin Engineering, Inc.	**Client Sample ID:**	SB-3 @ 64-65'
Lab Order:	0711133	**Collection Date:**	11/7/2007 2:00:00 PM
Project:	Shamrock #63	**Date Received:**	11/8/2007
Lab ID:	0711133-02	**Matrix:**	MEOH (SOIL)

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **LMM**
Chloroethane	ND	0.10		mg/Kg	1	11/11/2007 10:07:59 AM
Chloroform	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
Chloromethane	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
2-Chlorotoluene	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
4-Chlorotoluene	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
cis-1,2-DCE	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
cis-1,3-Dichloropropene	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
1,2-Dibromo-3-chloropropane	ND	0.10		mg/Kg	1	11/11/2007 10:07:59 AM
Dibromochloromethane	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
Dibromomethane	ND	0.10		mg/Kg	1	11/11/2007 10:07:59 AM
1,2-Dichlorobenzene	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
1,3-Dichlorobenzene	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
1,4-Dichlorobenzene	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
Dichlorodifluoromethane	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
1,1-Dichloroethane	ND	0.10		mg/Kg	1	11/11/2007 10:07:59 AM
1,1-Dichloroethene	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
1,2-Dichloropropane	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
1,3-Dichloropropane	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
2,2-Dichloropropane	ND	0.10		mg/Kg	1	11/11/2007 10:07:59 AM
1,1-Dichloropropene	ND	0.10		mg/Kg	1	11/11/2007 10:07:59 AM
Hexachlorobutadiene	ND	0.10		mg/Kg	1	11/11/2007 10:07:59 AM
2-Hexanone	ND	0.50		mg/Kg	1	11/11/2007 10:07:59 AM
Isopropylbenzene	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
4-Isopropyltoluene	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
4-Methyl-2-pentanone	ND	0.50		mg/Kg	1	11/11/2007 10:07:59 AM
Methylene chloride	ND	0.15		mg/Kg	1	11/11/2007 10:07:59 AM
n-Butylbenzene	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
n-Propylbenzene	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
sec-Butylbenzene	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
Styrene	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
tert-Butylbenzene	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
1,1,1,2-Tetrachloroethane	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
1,1,2,2-Tetrachloroethane	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
Tetrachloroethene (PCE)	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
trans-1,2-DCE	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
trans-1,3-Dichloropropene	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
1,2,3-Trichlorobenzene	ND	0.10		mg/Kg	1	11/11/2007 10:07:59 AM
1,2,4-Trichlorobenzene	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
1,1,1-Trichloroethane	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
1,1,2-Trichloroethane	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
Trichloroethene (TCE)	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
Trichlorofluoromethane	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

Date: *28-Nov-07*

CLIENT:	Basin Engineering, Inc.	**Client Sample ID:**	SB-3 @ 64-65'
Lab Order:	0711133	**Collection Date:**	11/7/2007 2:00:00 PM
Project:	Shamrock #63	**Date Received:**	11/8/2007
Lab ID:	0711133-02	**Matrix:**	MEOH (SOIL)

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **LMM**
1,2,3-Trichloropropane	ND	0.10		mg/Kg	1	11/11/2007 10:07:59 AM
Vinyl chloride	ND	0.050		mg/Kg	1	11/11/2007 10:07:59 AM
Xylenes, Total	ND	0.10		mg/Kg	1	11/11/2007 10:07:59 AM
Surr: 1,2-Dichloroethane-d4	110	68.7-122		%REC	1	11/11/2007 10:07:59 AM
Surr: 4-Bromofluorobenzene	109	79.3-126		%REC	1	11/11/2007 10:07:59 AM
Surr: Dibromofluoromethane	96.5	64.4-119		%REC	1	11/11/2007 10:07:59 AM
Surr: Toluene-d8	107	86.5-121		%REC	1	11/11/2007 10:07:59 AM
TOC BY WALKLEY BLACK						Analyst: **KS**
TOC	ND	0.13		% C	1	11/20/2007

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	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *28-Nov-07*

CLIENT:	Basin Engineering, Inc.	**Client Sample ID:**	SB-3 @ 79-80'
Lab Order:	0711133	**Collection Date:**	11/7/2007 3:00:00 PM
Project:	Shamrock #63	**Date Received:**	11/8/2007
Lab ID:	0711133-03	**Matrix:**	MEOH (SOIL)

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8310: PAHS						Analyst: **JMP**
Naphthalene	ND	0.25		mg/Kg	1	11/27/2007 10:52:04 PM
1-Methylnaphthalene	ND	0.25		mg/Kg	1	11/27/2007 10:52:04 PM
2-Methylnaphthalene	ND	0.25		mg/Kg	1	11/27/2007 10:52:04 PM
Acenaphthylene	ND	0.25		mg/Kg	1	11/27/2007 10:52:04 PM
Acenaphthene	ND	0.25		mg/Kg	1	11/27/2007 10:52:04 PM
Fluorene	ND	0.030		mg/Kg	1	11/27/2007 10:52:04 PM
Phenanthrene	ND	0.015		mg/Kg	1	11/27/2007 10:52:04 PM
Anthracene	ND	0.015		mg/Kg	1	11/27/2007 10:52:04 PM
Fluoranthene	ND	0.020		mg/Kg	1	11/27/2007 10:52:04 PM
Pyrene	ND	0.025		mg/Kg	1	11/27/2007 10:52:04 PM
Benz(a)anthracene	ND	0.0020		mg/Kg	1	11/27/2007 10:52:04 PM
Chrysene	ND	0.011		mg/Kg	1	11/27/2007 10:52:04 PM
Benzo(b)fluoranthene	ND	0.0040		mg/Kg	1	11/27/2007 10:52:04 PM
Benzo(k)fluoranthene	ND	0.0010		mg/Kg	1	11/27/2007 10:52:04 PM
Benzo(a)pyrene	ND	0.0010		mg/Kg	1	11/27/2007 10:52:04 PM
Dibenz(a,h)anthracene	ND	0.0030		mg/Kg	1	11/27/2007 10:52:04 PM
Benzo(g,h,i)perylene	ND	0.0030		mg/Kg	1	11/27/2007 10:52:04 PM
Indeno(1,2,3-cd)pyrene	ND	0.0040		mg/Kg	1	11/27/2007 10:52:04 PM
Surr: Benzo(e)pyrene	111	52.8-123		%REC	1	11/27/2007 10:52:04 PM
EPA METHOD 8260B: VOLATILES						Analyst: **LMM**
Benzene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
Toluene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
Ethylbenzene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
Methyl tert-butyl ether (MTBE)	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
1,2,4-Trimethylbenzene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
1,3,5-Trimethylbenzene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
1,2-Dichloroethane (EDC)	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
1,2-Dibromoethane (EDB)	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
Naphthalene	ND	0.10		mg/Kg	1	11/11/2007 10:43:48 AM
1-Methylnaphthalene	ND	0.20		mg/Kg	1	11/11/2007 10:43:48 AM
2-Methylnaphthalene	ND	0.20		mg/Kg	1	11/11/2007 10:43:48 AM
Acetone	ND	0.75		mg/Kg	1	11/11/2007 10:43:48 AM
Bromobenzene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
Bromochloromethane	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
Bromodichloromethane	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
Bromoform	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
Bromomethane	ND	0.10		mg/Kg	1	11/11/2007 10:43:48 AM
2-Butanone	ND	0.50		mg/Kg	1	11/11/2007 10:43:48 AM
Carbon disulfide	ND	0.50		mg/Kg	1	11/11/2007 10:43:48 AM
Carbon tetrachloride	ND	0.10		mg/Kg	1	11/11/2007 10:43:48 AM
Chlorobenzene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

Date: *28-Nov-07*

CLIENT:	Basin Engineering, Inc.	**Client Sample ID:**	SB-3 @ 79-80'
Lab Order:	0711133	**Collection Date:**	11/7/2007 3:00:00 PM
Project:	Shamrock #63	**Date Received:**	11/8/2007
Lab ID:	0711133-03	**Matrix:**	MEOH (SOIL)

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **LMM**
Chloroethane	ND	0.10		mg/Kg	1	11/11/2007 10:43:48 AM
Chloroform	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
Chloromethane	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
2-Chlorotoluene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
4-Chlorotoluene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
cis-1,2-DCE	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
cis-1,3-Dichloropropene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
1,2-Dibromo-3-chloropropane	ND	0.10		mg/Kg	1	11/11/2007 10:43:48 AM
Dibromochloromethane	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
Dibromomethane	ND	0.10		mg/Kg	1	11/11/2007 10:43:48 AM
1,2-Dichlorobenzene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
1,3-Dichlorobenzene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
1,4-Dichlorobenzene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
Dichlorodifluoromethane	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
1,1-Dichloroethane	ND	0.10		mg/Kg	1	11/11/2007 10:43:48 AM
1,1-Dichloroethene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
1,2-Dichloropropane	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
1,3-Dichloropropane	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
2,2-Dichloropropane	ND	0.10		mg/Kg	1	11/11/2007 10:43:48 AM
1,1-Dichloropropene	ND	0.10		mg/Kg	1	11/11/2007 10:43:48 AM
Hexachlorobutadiene	ND	0.10		mg/Kg	1	11/11/2007 10:43:48 AM
2-Hexanone	ND	0.50		mg/Kg	1	11/11/2007 10:43:48 AM
Isopropylbenzene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
4-Isopropyltoluene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
4-Methyl-2-pentanone	ND	0.50		mg/Kg	1	11/11/2007 10:43:48 AM
Methylene chloride	ND	0.15		mg/Kg	1	11/11/2007 10:43:48 AM
n-Butylbenzene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
n-Propylbenzene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
sec-Butylbenzene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
Styrene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
tert-Butylbenzene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
1,1,1,2-Tetrachloroethane	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
1,1,2,2-Tetrachloroethane	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
Tetrachloroethene (PCE)	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
trans-1,2-DCE	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
trans-1,3-Dichloropropene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
1,2,3-Trichlorobenzene	ND	0.10		mg/Kg	1	11/11/2007 10:43:48 AM
1,2,4-Trichlorobenzene	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
1,1,1-Trichloroethane	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
1,1,2-Trichloroethane	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
Trichloroethene (TCE)	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
Trichlorofluoromethane	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

Date: *28-Nov-07*

CLIENT:	Basin Engineering, Inc.	**Client Sample ID:**	SB-3 @ 79-80'
Lab Order:	0711133	**Collection Date:**	11/7/2007 3:00:00 PM
Project:	Shamrock #63	**Date Received:**	11/8/2007
Lab ID:	0711133-03	**Matrix:**	MEOH (SOIL)

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **LMM**
1,2,3-Trichloropropane	ND	0.10		mg/Kg	1	11/11/2007 10:43:48 AM
Vinyl chloride	ND	0.050		mg/Kg	1	11/11/2007 10:43:48 AM
Xylenes, Total	ND	0.10		mg/Kg	1	11/11/2007 10:43:48 AM
Surr: 1,2-Dichloroethane-d4	106	68.7-122		%REC	1	11/11/2007 10:43:48 AM
Surr: 4-Bromofluorobenzene	95.5	79.3-126		%REC	1	11/11/2007 10:43:48 AM
Surr: Dibromofluoromethane	95.1	64.4-119		%REC	1	11/11/2007 10:43:48 AM
Surr: Toluene-d8	103	86.5-121		%REC	1	11/11/2007 10:43:48 AM
TOC BY WALKLEY BLACK						Analyst: **KS**
TOC	ND	0.13		% C	1	11/20/2007

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	MCL	Maximum Contaminant Level
	ND	Not Detected at the Reporting Limit	RL	Reporting Limit
	S	Spike recovery outside accepted recovery limits		

QA/QC SUMMARY REPORT

Client: Basin Engineering, Inc.
Project: Shamrock #63 **Work Order:** 0711133

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 8310: PAHs									
Sample ID: 0711133-01AMSD		*MSD*			Batch ID:	**14455**	Analysis Date:	11/28/2007 12:27:59 AM	
Naphthalene	0.5932	mg/Kg	0.25	55.7	17.9	67.1	5.50	20	
1-Methylnaphthalene	0.6785	mg/Kg	0.25	56.2	20.7	66.4	4.18	20	
2-Methylnaphthalene	0.7775	mg/Kg	0.25	57.4	21.4	67.3	3.30	20	
Acenaphthylene	0.7168	mg/Kg	0.25	71.7	26.2	82.1	4.19	20	
Acenaphthene	0.5958	mg/Kg	0.25	59.6	25	74.4	4.16	20	
Fluorene	0.06675	mg/Kg	0.030	63.8	25.2	82	3.43	20	
Phenanthrene	0.07250	mg/Kg	0.015	72.1	25.1	93.9	1.04	20	
Anthracene	0.04225	mg/Kg	0.015	72.1	25.1	92.6	2.40	20	
Fluoranthene	0.07250	mg/Kg	0.020	72.3	28.5	99	2.44	20	
Pyrene	0.07750	mg/Kg	0.025	77.5	32.3	98.3	0.972	20	
Benz(a)anthracene	0.008500	mg/Kg	0.0020	85.0	-13.8	167	2.99	20	
Chrysene	0.04875	mg/Kg	0.011	74.6	45.7	91.4	1.03	20	
Benzo(b)fluoranthene	0.008500	mg/Kg	0.0040	68.0	42	100	2.99	20	
Benzo(k)fluoranthene	0.006000	mg/Kg	0.0010	96.0	43.3	99.9	0	20	
Benzo(a)pyrene	0.006000	mg/Kg	0.0010	95.5	46.7	101	8.00	20	
Dibenz(a,h)anthracene	0.01025	mg/Kg	0.0030	82.0	50.2	97	0	20	
Benzo(g,h,i)perylene	0.01250	mg/Kg	0.0030	100	51.5	101	2.02	20	
Indeno(1,2,3-cd)pyrene	0.02320	mg/Kg	0.0040	92.4	23.2	158	11.8	20	
Sample ID: MB-14455		*MBLK*			Batch ID:	**14455**	Analysis Date:	11/27/2007 6:52:11 PM	
Naphthalene	ND	mg/Kg	0.25						
1-Methylnaphthalene	ND	mg/Kg	0.25						
2-Methylnaphthalene	ND	mg/Kg	0.25						
Acenaphthylene	ND	mg/Kg	0.25						
Acenaphthene	ND	mg/Kg	0.25						
Fluorene	ND	mg/Kg	0.030						
Phenanthrene	ND	mg/Kg	0.015						
Anthracene	ND	mg/Kg	0.015						
Fluoranthene	ND	mg/Kg	0.020						
Pyrene	ND	mg/Kg	0.025						
Benz(a)anthracene	ND	mg/Kg	0.0020						
Chrysene	ND	mg/Kg	0.011						
Benzo(b)fluoranthene	ND	mg/Kg	0.0040						
Benzo(k)fluoranthene	ND	mg/Kg	0.0010						
Benzo(a)pyrene	ND	mg/Kg	0.0010						
Dibenz(a,h)anthracene	ND	mg/Kg	0.0030						
Benzo(g,h,i)perylene	ND	mg/Kg	0.0030						
Indeno(1,2,3-cd)pyrene	ND	mg/Kg	0.0040						
Sample ID: 0711133-01AMS		*MS*			Batch ID:	**14455**	Analysis Date:	11/27/2007 11:40:01 PM	
Naphthalene	0.5615	mg/Kg	0.25	52.5	17.9	67.1			
1-Methylnaphthalene	0.6508	mg/Kg	0.25	53.4	20.7	66.4			
2-Methylnaphthalene	0.7522	mg/Kg	0.25	54.8	21.4	67.3			
Acenaphthylene	0.6874	mg/Kg	0.25	68.7	26.2	82.1			
Acenaphthene	0.5715	mg/Kg	0.25	57.2	25	74.4			
Fluorene	0.06450	mg/Kg	0.030	61.5	25.2	82			

Qualifiers:

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

QA/QC SUMMARY REPORT

Client: Basin Engineering, Inc.
Project: Shamrock #63 **Work Order:** 0711133

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 8310: PAHs									
Sample ID: 0711133-01AMS		*MS*			Batch ID: **14455**		Analysis Date: 11/27/2007 11:40:01 PM		
Phenanthrene	0.07175	mg/Kg	0.015	70.6	25.1	93.9			
Anthracene	0.04125	mg/Kg	0.015	70.1	25.1	92.6			
Fluoranthene	0.07075	mg/Kg	0.020	70.5	28.5	99			
Pyrene	0.07675	mg/Kg	0.025	76.8	32.3	98.3			
Benz(a)anthracene	0.008250	mg/Kg	0.0020	82.5	-13.8	167			
Chrysene	0.04825	mg/Kg	0.011	73.6	45.7	91.4			
Benzo(b)fluoranthene	0.008250	mg/Kg	0.0040	66.0	42	100			
Benzo(k)fluoranthene	0.006000	mg/Kg	0.0010	96.0	43.3	99.9			
Benzo(a)pyrene	0.006500	mg/Kg	0.0010	104	46.7	101			S
Dibenz(a,h)anthracene	0.01025	mg/Kg	0.0030	82.0	50.2	97			
Benzo(g,h,i)perylene	0.01225	mg/Kg	0.0030	98.0	51.5	101			
Indeno(1,2,3-cd)pyrene	0.02062	mg/Kg	0.0040	82.2	23.2	158			
Method: TOC by Walkley Black									
Sample ID: 0711133-01AMSD		*MSD*			Batch ID: **14465**		Analysis Date:		11/20/2007
TOC	2.960	% C	0.13	105	75	125	1.02	25	
Sample ID: MB-14465		*MBLK*			Batch ID: **14465**		Analysis Date:		11/20/2007
TOC	ND	% C	0.13						
Sample ID: LCS-14465		*LCS*			Batch ID: **14465**		Analysis Date:		11/20/2007
TOC	2.890	% C	0.13	105	80	120			
Sample ID: 0711133-01AMS		*MS*			Batch ID: **14465**		Analysis Date:		11/20/2007
TOC	2.930	% C	0.13	104	75	125			

Qualifiers:

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

QA/QC SUMMARY REPORT

Client: Basin Engineering, Inc.
Project: Shamrock #63 **Work Order:** 0711133

Method: EPA Method 8260B: VOLATILES
Sample ID: MB-14352 *MBLK* Batch ID: **14352** Analysis Date: 11/11/2007 4:10:55 AM

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	mg/Kg	0.050						
Toluene	ND	mg/Kg	0.050						
Ethylbenzene	ND	mg/Kg	0.050						
Methyl tert-butyl ether (MTBE)	ND	mg/Kg	0.050						
1,2,4-Trimethylbenzene	ND	mg/Kg	0.050						
1,3,5-Trimethylbenzene	ND	mg/Kg	0.050						
1,2-Dichloroethane (EDC)	ND	mg/Kg	0.050						
1,2-Dibromoethane (EDB)	ND	mg/Kg	0.050						
Naphthalene	ND	mg/Kg	0.10						
1-Methylnaphthalene	ND	mg/Kg	0.20						
2-Methylnaphthalene	ND	mg/Kg	0.20						
Acetone	ND	mg/Kg	0.75						
Bromobenzene	ND	mg/Kg	0.050						
Bromochloromethane	ND	mg/Kg	0.050						
Bromodichloromethane	ND	mg/Kg	0.050						
Bromoform	ND	mg/Kg	0.050						
Bromomethane	ND	mg/Kg	0.10						
2-Butanone	ND	mg/Kg	0.50						
Carbon disulfide	ND	mg/Kg	0.50						
Carbon tetrachloride	ND	mg/Kg	0.10						
Chlorobenzene	ND	mg/Kg	0.050						
Chloroethane	ND	mg/Kg	0.10						
Chloroform	ND	mg/Kg	0.050						
Chloromethane	ND	mg/Kg	0.050						
2-Chlorotoluene	ND	mg/Kg	0.050						
4-Chlorotoluene	ND	mg/Kg	0.050						
cis-1,2-DCE	ND	mg/Kg	0.050						
cis-1,3-Dichloropropene	ND	mg/Kg	0.050						
1,2-Dibromo-3-chloropropane	ND	mg/Kg	0.10						
Dibromochloromethane	ND	mg/Kg	0.050						
Dibromomethane	ND	mg/Kg	0.10						
1,2-Dichlorobenzene	ND	mg/Kg	0.050						
1,3-Dichlorobenzene	ND	mg/Kg	0.050						
1,4-Dichlorobenzene	ND	mg/Kg	0.050						
Dichlorodifluoromethane	ND	mg/Kg	0.050						
1,1-Dichloroethane	ND	mg/Kg	0.10						
1,1-Dichloroethene	ND	mg/Kg	0.050						
1,2-Dichloropropane	ND	mg/Kg	0.050						
1,3-Dichloropropane	ND	mg/Kg	0.050						
2,2-Dichloropropane	ND	mg/Kg	0.10						
1,1-Dichloropropene	ND	mg/Kg	0.10						
Hexachlorobutadiene	ND	mg/Kg	0.10						
2-Hexanone	ND	mg/Kg	0.50						
Isopropylbenzene	ND	mg/Kg	0.050						

Qualifiers:

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

QA/QC SUMMARY REPORT

Client: Basin Engineering, Inc.
Project: Shamrock #63 **Work Order:** 0711133

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 8260B: VOLATILES									
Sample ID: MB-14352		*MBLK*			Batch ID:	**14352**	Analysis Date:	11/11/2007 4:10:55 AM	
4-Isopropyltoluene	ND	mg/Kg	0.050						
4-Methyl-2-pentanone	ND	mg/Kg	0.50						
Methylene chloride	ND	mg/Kg	0.15						
n-Butylbenzene	ND	mg/Kg	0.050						
n-Propylbenzene	ND	mg/Kg	0.050						
sec-Butylbenzene	ND	mg/Kg	0.050						
Styrene	ND	mg/Kg	0.050						
tert-Butylbenzene	ND	mg/Kg	0.050						
1,1,1,2-Tetrachloroethane	ND	mg/Kg	0.050						
1,1,2,2-Tetrachloroethane	ND	mg/Kg	0.050						
Tetrachloroethene (PCE)	ND	mg/Kg	0.050						
trans-1,2-DCE	ND	mg/Kg	0.050						
trans-1,3-Dichloropropene	ND	mg/Kg	0.050						
1,2,3-Trichlorobenzene	ND	mg/Kg	0.10						
1,2,4-Trichlorobenzene	ND	mg/Kg	0.050						
1,1,1-Trichloroethane	ND	mg/Kg	0.050						
1,1,2-Trichloroethane	ND	mg/Kg	0.050						
Trichloroethene (TCE)	ND	mg/Kg	0.050						
Trichlorofluoromethane	ND	mg/Kg	0.050						
1,2,3-Trichloropropane	ND	mg/Kg	0.10						
Vinyl chloride	ND	mg/Kg	0.050						
Xylenes, Total	ND	mg/Kg	0.10						
Sample ID: LCS-14352		*LCS*			Batch ID:	**14352**	Analysis Date:	11/11/2007 4:46:39 AM	
Benzene	1.112	mg/Kg	0.050	111	78.2	123			
Toluene	1.025	mg/Kg	0.050	103	72.6	128			
Chlorobenzene	1.055	mg/Kg	0.050	106	82.2	116			
1,1-Dichloroethene	1.070	mg/Kg	0.050	107	64.9	132			
Trichloroethene (TCE)	0.9957	mg/Kg	0.050	99.6	65.1	108			
Sample ID: LCSD-14352		*LCSD*			Batch ID:	**14352**	Analysis Date:	11/11/2007 5:22:23 AM	
Benzene	1.012	mg/Kg	0.050	101	83.2	118	9.39	20	
Toluene	0.9430	mg/Kg	0.050	94.3	84.8	112	8.37	20	
Chlorobenzene	1.085	mg/Kg	0.050	109	85.1	113	2.81	20	
1,1-Dichloroethene	0.9254	mg/Kg	0.050	92.5	83.4	126	14.5	20	
Trichloroethene (TCE)	0.8671	mg/Kg	0.050	86.7	83.5	111	13.8	20	

Qualifiers:

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

CHAIN-OF-CUSTODY RECORD

QA / QC Package:
Std ☐ Level 4 ☐
Other: _____

Client: Basin Engineering

Address: PO Box 3909
Durango, CO 81302

Phone #: 970 259 2078

Fax #: 970 385 4812

Project Name: Shamrock #63

Project #: 0301-16

Project Manager: John Casey

Sampler: John Casey

Sample Temperature: 10° on ice

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative $HgCl_2$	Preservative HNO_3	Preservative	HEAL No. 0711133
11-7-07	10:25	Soil	SB-3 @ 21'	2-20 ml 1-40z				1
11-7-07	14:00	Soil	SB-3 @ 64-65'	2-20ml 1-40z				2
11-7-07	15:00	Soil	SB-3 @ 79-80'	2-20ml 1-40z				3

Date	Time	Relinquished By: (Signature)	Received By: (Signature)
11-8-07	12:30		
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature) 11/8/07 1230

HALL ENVIRONMENTAL ANALYSIS LABORATORY
4901 Hawkins NE, Suite D
Albuquerque, New Mexico 87109
Tel. 505.345.3975 Fax 505.345.4107
www.hallenvironmental.com

ANALYSIS REQUEST

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	EDC (Method 8021)	8310 (PNA or PAH)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / PCB's (8082)	8260B (VOA)	8270 (Semi-VOA)						Air Bubbles or Headspace (Y or N)
										X							
										X							
										X							

Remarks: 11/15/07 PER JC ADD 8310 TO ANALYSES /AT
11/16/07 PER JC ADDED TOC TO ANALYSES

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

COVER LETTER

Wednesday, November 28, 2007

John Casey
Basin Engineering, Inc.
248 Bodo Drive
Durango, CO 81302

TEL: (970) 259-2078
FAX (970) 385-4812

RE: Shamrock #63

Order No.: 0711295

Dear John Casey:

Hall Environmental Analysis Laboratory, Inc. received 1 sample(s) on 11/16/2007 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

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

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

Sincerely,

Andy Freeman, Business Manager
Nancy McDuffie, Laboratory Manager

NM Lab # NM9425
AZ license # AZ0682
ORELAP Lab # NM100001

ACCREDITED IN ACCORDANCE WITH nelac

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

Hall Environmental Analysis Laboratory, Inc.

Date: *28-Nov-07*

CLIENT:	Basin Engineering, Inc.	**Client Sample ID:**	MW-1
Lab Order:	0711295	**Collection Date:**	11/16/2007 1:30:00 PM
Project:	Shamrock #63	**Date Received:**	11/16/2007
Lab ID:	0711295-01	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8310: PAHS						Analyst: **JMP**
Naphthalene	87	2.0		µg/L	1	11/21/2007 11:11:31 PM
1-Methylnaphthalene	16	2.0		µg/L	1	11/21/2007 11:11:31 PM
2-Methylnaphthalene	28	2.0		µg/L	1	11/21/2007 11:11:31 PM
Acenaphthylene	ND	2.5		µg/L	1	11/21/2007 11:11:31 PM
Acenaphthene	ND	5.0		µg/L	1	11/21/2007 11:11:31 PM
Fluorene	ND	0.80		µg/L	1	11/21/2007 11:11:31 PM
Phenanthrene	ND	0.60		µg/L	1	11/21/2007 11:11:31 PM
Anthracene	ND	0.60		µg/L	1	11/27/2007 4:54:29 AM
Fluoranthene	ND	0.30		µg/L	1	11/21/2007 11:11:31 PM
Pyrene	ND	0.30		µg/L	1	11/21/2007 11:11:31 PM
Benz(a)anthracene	ND	0.050		µg/L	1	11/21/2007 11:11:31 PM
Chrysene	ND	0.20		µg/L	1	11/21/2007 11:11:31 PM
Benzo(b)fluoranthene	ND	0.10		µg/L	1	11/21/2007 11:11:31 PM
Benzo(k)fluoranthene	ND	0.020		µg/L	1	11/21/2007 11:11:31 PM
Benzo(a)pyrene	ND	0.030		µg/L	1	11/21/2007 11:11:31 PM
Dibenz(a,h)anthracene	ND	0.040		µg/L	1	11/21/2007 11:11:31 PM
Benzo(g,h,i)perylene	ND	0.080		µg/L	1	11/21/2007 11:11:31 PM
Indeno(1,2,3-cd)pyrene	ND	0.080		µg/L	1	11/21/2007 11:11:31 PM
Surr: Benzo(e)pyrene	70.9	68-116		%REC	1	11/21/2007 11:11:31 PM
EPA METHOD 8260B: VOLATILES						Analyst: **LMM**
Benzene	1700	50		µg/L	50	11/21/2007 11:28:00 AM
Toluene	260	10		µg/L	10	11/21/2007 1:50:58 PM
Ethylbenzene	85	10		µg/L	10	11/21/2007 1:50:58 PM
Methyl tert-butyl ether (MTBE)	1100	10		µg/L	10	11/21/2007 1:50:58 PM
1,2,4-Trimethylbenzene	260	10		µg/L	10	11/21/2007 1:50:58 PM
1,3,5-Trimethylbenzene	85	10		µg/L	10	11/21/2007 1:50:58 PM
1,2-Dichloroethane (EDC)	41	10		µg/L	10	11/21/2007 1:50:58 PM
1,2-Dibromoethane (EDB)	ND	10		µg/L	10	11/21/2007 1:50:58 PM
Naphthalene	91	20		µg/L	10	11/21/2007 1:50:58 PM
1-Methylnaphthalene	ND	40		µg/L	10	11/21/2007 1:50:58 PM
2-Methylnaphthalene	ND	40		µg/L	10	11/21/2007 1:50:58 PM
Acetone	ND	100		µg/L	10	11/21/2007 1:50:58 PM
Bromobenzene	ND	10		µg/L	10	11/21/2007 1:50:58 PM
Bromochloromethane	ND	10		µg/L	10	11/21/2007 1:50:58 PM
Bromodichloromethane	ND	10		µg/L	10	11/21/2007 1:50:58 PM
Bromoform	ND	10		µg/L	10	11/21/2007 1:50:58 PM
Bromomethane	ND	10		µg/L	10	11/21/2007 1:50:58 PM
2-Butanone	ND	100		µg/L	10	11/21/2007 1:50:58 PM
Carbon disulfide	ND	100		µg/L	10	11/21/2007 1:50:58 PM
Carbon Tetrachloride	ND	10		µg/L	10	11/21/2007 1:50:58 PM
Chlorobenzene	ND	10		µg/L	10	11/21/2007 1:50:58 PM

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

Date: *28-Nov-07*

CLIENT:	Basin Engineering, Inc.	**Client Sample ID:**	MW-1
Lab Order:	0711295	**Collection Date:**	11/16/2007 1:30:00 PM
Project:	Shamrock #63	**Date Received:**	11/16/2007
Lab ID:	0711295-01	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **LMM**
Chloroethane	ND	20		µg/L	10	11/21/2007 1:50:58 PM
Chloroform	ND	10		µg/L	10	11/21/2007 1:50:58 PM
Chloromethane	ND	10		µg/L	10	11/21/2007 1:50:58 PM
2-Chlorotoluene	ND	10		µg/L	10	11/21/2007 1:50:58 PM
4-Chlorotoluene	ND	10		µg/L	10	11/21/2007 1:50:58 PM
cis-1,2-DCE	ND	10		µg/L	10	11/21/2007 1:50:58 PM
cis-1,3-Dichloropropene	ND	10		µg/L	10	11/21/2007 1:50:58 PM
1,2-Dibromo-3-chloropropane	ND	20		µg/L	10	11/21/2007 1:50:58 PM
Dibromochloromethane	ND	10		µg/L	10	11/21/2007 1:50:58 PM
Dibromomethane	ND	10		µg/L	10	11/21/2007 1:50:58 PM
1,2-Dichlorobenzene	ND	10		µg/L	10	11/21/2007 1:50:58 PM
1,3-Dichlorobenzene	ND	10		µg/L	10	11/21/2007 1:50:58 PM
1,4-Dichlorobenzene	ND	10		µg/L	10	11/21/2007 1:50:58 PM
Dichlorodifluoromethane	ND	10		µg/L	10	11/21/2007 1:50:58 PM
1,1-Dichloroethane	ND	10		µg/L	10	11/21/2007 1:50:58 PM
1,1-Dichloroethene	ND	10		µg/L	10	11/21/2007 1:50:58 PM
1,2-Dichloropropane	ND	10		µg/L	10	11/21/2007 1:50:58 PM
1,3-Dichloropropane	ND	10		µg/L	10	11/21/2007 1:50:58 PM
2,2-Dichloropropane	ND	20		µg/L	10	11/21/2007 1:50:58 PM
1,1-Dichloropropene	ND	10		µg/L	10	11/21/2007 1:50:58 PM
Hexachlorobutadiene	ND	10		µg/L	10	11/21/2007 1:50:58 PM
2-Hexanone	ND	100		µg/L	10	11/21/2007 1:50:58 PM
Isopropylbenzene	10	10		µg/L	10	11/21/2007 1:50:58 PM
4-Isopropyltoluene	ND	10		µg/L	10	11/21/2007 1:50:58 PM
4-Methyl-2-pentanone	ND	100		µg/L	10	11/21/2007 1:50:58 PM
Methylene Chloride	ND	30		µg/L	10	11/21/2007 1:50:58 PM
n-Butylbenzene	13	10		µg/L	10	11/21/2007 1:50:58 PM
n-Propylbenzene	28	10		µg/L	10	11/21/2007 1:50:58 PM
sec-Butylbenzene	ND	10		µg/L	10	11/21/2007 1:50:58 PM
Styrene	ND	10		µg/L	10	11/21/2007 1:50:58 PM
tert-Butylbenzene	ND	10		µg/L	10	11/21/2007 1:50:58 PM
1,1,1,2-Tetrachloroethane	ND	10		µg/L	10	11/21/2007 1:50:58 PM
1,1,2,2-Tetrachloroethane	ND	20		µg/L	10	11/21/2007 1:50:58 PM
Tetrachloroethene (PCE)	ND	10		µg/L	10	11/21/2007 1:50:58 PM
trans-1,2-DCE	ND	10		µg/L	10	11/21/2007 1:50:58 PM
trans-1,3-Dichloropropene	ND	10		µg/L	10	11/21/2007 1:50:58 PM
1,2,3-Trichlorobenzene	ND	10		µg/L	10	11/21/2007 1:50:58 PM
1,2,4-Trichlorobenzene	ND	10		µg/L	10	11/21/2007 1:50:58 PM
1,1,1-Trichloroethane	ND	10		µg/L	10	11/21/2007 1:50:58 PM
1,1,2-Trichloroethane	ND	10		µg/L	10	11/21/2007 1:50:58 PM
Trichloroethene (TCE)	ND	10		µg/L	10	11/21/2007 1:50:58 PM
Trichlorofluoromethane	ND	10		µg/L	10	11/21/2007 1:50:58 PM

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

Date: *28-Nov-07*

CLIENT:	Basin Engineering, Inc.	**Client Sample ID:**	MW-1
Lab Order:	0711295	**Collection Date:**	11/16/2007 1:30:00 PM
Project:	Shamrock #63	**Date Received:**	11/16/2007
Lab ID:	0711295-01	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **LMM**
1,2,3-Trichloropropane	ND	20		µg/L	10	11/21/2007 1:50:58 PM
Vinyl chloride	ND	10		µg/L	10	11/21/2007 1:50:58 PM
Xylenes, Total	1000	15		µg/L	10	11/21/2007 1:50:58 PM
Surr: 1,2-Dichloroethane-d4	108	68.1-123		%REC	10	11/21/2007 1:50:58 PM
Surr: 4-Bromofluorobenzene	113	53.2-145		%REC	10	11/21/2007 1:50:58 PM
Surr: Dibromofluoromethane	84.8	68.5-119		%REC	10	11/21/2007 1:50:58 PM
Surr: Toluene-d8	102	64-131		%REC	10	11/21/2007 1:50:58 PM

Qualifiers:

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

QA/QC SUMMARY REPORT

Client: Basin Engineering, Inc.
Project: Shamrock #63

Work Order: 0711295

Method: EPA Method 8260B: VOLATILES

Sample ID: 5mL rb *MBLK*

Batch ID: **R26167** Analysis Date: 11/20/2007 10:15:13 AM

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	µg/L	1.0						
Toluene	ND	µg/L	1.0						
Ethylbenzene	ND	µg/L	1.0						
Methyl tert-butyl ether (MTBE)	ND	µg/L	1.0						
1,2,4-Trimethylbenzene	ND	µg/L	1.0						
1,3,5-Trimethylbenzene	ND	µg/L	1.0						
1,2-Dichloroethane (EDC)	ND	µg/L	1.0						
1,2-Dibromoethane (EDB)	ND	µg/L	1.0						
Naphthalene	ND	µg/L	2.0						
1-Methylnaphthalene	ND	µg/L	4.0						
2-Methylnaphthalene	ND	µg/L	4.0						
Acetone	ND	µg/L	10						
Bromobenzene	ND	µg/L	1.0						
Bromochloromethane	ND	µg/L	1.0						
Bromodichloromethane	ND	µg/L	1.0						
Bromoform	ND	µg/L	1.0						
Bromomethane	ND	µg/L	1.0						
2-Butanone	ND	µg/L	10						
Carbon disulfide	ND	µg/L	10						
Carbon Tetrachloride	ND	µg/L	1.0						
Chlorobenzene	ND	µg/L	1.0						
Chloroethane	ND	µg/L	2.0						
Chloroform	ND	µg/L	1.0						
Chloromethane	ND	µg/L	1.0						
2-Chlorotoluene	ND	µg/L	1.0						
4-Chlorotoluene	ND	µg/L	1.0						
cis-1,2-DCE	ND	µg/L	1.0						
cis-1,3-Dichloropropene	ND	µg/L	1.0						
1,2-Dibromo-3-chloropropane	ND	µg/L	2.0						
Dibromochloromethane	ND	µg/L	1.0						
Dibromomethane	ND	µg/L	1.0						
1,2-Dichlorobenzene	ND	µg/L	1.0						
1,3-Dichlorobenzene	ND	µg/L	1.0						
1,4-Dichlorobenzene	ND	µg/L	1.0						
Dichlorodifluoromethane	ND	µg/L	1.0						
1,1-Dichloroethane	ND	µg/L	1.0						
1,1-Dichloroethene	ND	µg/L	1.0						
1,2-Dichloropropane	ND	µg/L	1.0						
1,3-Dichloropropane	ND	µg/L	1.0						
2,2-Dichloropropane	ND	µg/L	2.0						
1,1-Dichloropropene	ND	µg/L	1.0						
Hexachlorobutadiene	ND	µg/L	1.0						
2-Hexanone	ND	µg/L	10						
Isopropylbenzene	ND	µg/L	1.0						

Qualifiers:

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

QA/QC SUMMARY REPORT

Client: Basin Engineering, Inc.
Project: Shamrock #63 **Work Order:** 0711295

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 8260B: VOLATILES									
Sample ID: 5mL rb		*MBLK*			Batch ID: **R26167**		Analysis Date: 11/20/2007 10:15:13 AM		
4-Isopropyltoluene	ND	µg/L	1.0						
4-Methyl-2-pentanone	ND	µg/L	10						
Methylene Chloride	ND	µg/L	3.0						
n-Butylbenzene	ND	µg/L	1.0						
n-Propylbenzene	ND	µg/L	1.0						
sec-Butylbenzene	ND	µg/L	1.0						
Styrene	ND	µg/L	1.0						
tert-Butylbenzene	ND	µg/L	1.0						
1,1,1,2-Tetrachloroethane	ND	µg/L	1.0						
1,1,2,2-Tetrachloroethane	ND	µg/L	2.0						
Tetrachloroethene (PCE)	ND	µg/L	1.0						
trans-1,2-DCE	ND	µg/L	1.0						
trans-1,3-Dichloropropene	ND	µg/L	1.0						
1,2,3-Trichlorobenzene	ND	µg/L	1.0						
1,2,4-Trichlorobenzene	ND	µg/L	1.0						
1,1,1-Trichloroethane	ND	µg/L	1.0						
1,1,2-Trichloroethane	ND	µg/L	1.0						
Trichloroethene (TCE)	ND	µg/L	1.0						
Trichlorofluoromethane	ND	µg/L	1.0						
1,2,3-Trichloropropane	ND	µg/L	2.0						
Vinyl chloride	ND	µg/L	1.0						
Xylenes, Total	ND	µg/L	1.5						
Sample ID: 5mL rb		*MBLK*			Batch ID: **R26175**		Analysis Date: 11/21/2007 7:53:55 AM		
Benzene	ND	µg/L	1.0						
Toluene	ND	µg/L	1.0						
Ethylbenzene	ND	µg/L	1.0						
Methyl tert-butyl ether (MTBE)	ND	µg/L	1.0						
1,2,4-Trimethylbenzene	ND	µg/L	1.0						
1,3,5-Trimethylbenzene	ND	µg/L	1.0						
1,2-Dichloroethane (EDC)	ND	µg/L	1.0						
1,2-Dibromoethane (EDB)	ND	µg/L	1.0						
Naphthalene	ND	µg/L	2.0						
1-Methylnaphthalene	ND	µg/L	4.0						
2-Methylnaphthalene	ND	µg/L	4.0						
Acetone	ND	µg/L	10						
Bromobenzene	ND	µg/L	1.0						
Bromochloromethane	ND	µg/L	1.0						
Bromodichloromethane	ND	µg/L	1.0						
Bromoform	ND	µg/L	1.0						
Bromomethane	ND	µg/L	1.0						
2-Butanone	ND	µg/L	10						
Carbon disulfide	ND	µg/L	10						
Carbon Tetrachloride	ND	µg/L	1.0						
Chlorobenzene	ND	µg/L	1.0						

Qualifiers:

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

QA/QC SUMMARY REPORT

Client: Basin Engineering, Inc.
Project: Shamrock #63 **Work Order:** 0711295

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 8260B: VOLATILES									
Sample ID: 5mL rb		*MBLK*			Batch ID: **R26175**		Analysis Date: 11/21/2007 7:53:55 AM		
Chloroethane	ND	µg/L	2.0						
Chloroform	ND	µg/L	1.0						
Chloromethane	ND	µg/L	1.0						
2-Chlorotoluene	ND	µg/L	1.0						
4-Chlorotoluene	ND	µg/L	1.0						
cis-1,2-DCE	ND	µg/L	1.0						
cis-1,3-Dichloropropene	ND	µg/L	1.0						
1,2-Dibromo-3-chloropropane	ND	µg/L	2.0						
Dibromochloromethane	ND	µg/L	1.0						
Dibromomethane	ND	µg/L	1.0						
1,2-Dichlorobenzene	ND	µg/L	1.0						
1,3-Dichlorobenzene	ND	µg/L	1.0						
1,4-Dichlorobenzene	ND	µg/L	1.0						
Dichlorodifluoromethane	ND	µg/L	1.0						
1,1-Dichloroethane	ND	µg/L	1.0						
1,1-Dichloroethene	ND	µg/L	1.0						
1,2-Dichloropropane	ND	µg/L	1.0						
1,3-Dichloropropane	ND	µg/L	1.0						
2,2-Dichloropropane	ND	µg/L	2.0						
1,1-Dichloropropene	ND	µg/L	1.0						
Hexachlorobutadiene	ND	µg/L	1.0						
2-Hexanone	ND	µg/L	10						
Isopropylbenzene	ND	µg/L	1.0						
4-Isopropyltoluene	ND	µg/L	1.0						
4-Methyl-2-pentanone	ND	µg/L	10						
Methylene Chloride	ND	µg/L	3.0						
n-Butylbenzene	ND	µg/L	1.0						
n-Propylbenzene	ND	µg/L	1.0						
sec-Butylbenzene	ND	µg/L	1.0						
Styrene	ND	µg/L	1.0						
tert-Butylbenzene	ND	µg/L	1.0						
1,1,1,2-Tetrachloroethane	ND	µg/L	1.0						
1,1,2,2-Tetrachloroethane	ND	µg/L	2.0						
Tetrachloroethene (PCE)	ND	µg/L	1.0						
trans-1,2-DCE	ND	µg/L	1.0						
trans-1,3-Dichloropropene	ND	µg/L	1.0						
1,2,3-Trichlorobenzene	ND	µg/L	1.0						
1,2,4-Trichlorobenzene	ND	µg/L	1.0						
1,1,1-Trichloroethane	ND	µg/L	1.0						
1,1,2-Trichloroethane	ND	µg/L	1.0						
Trichloroethene (TCE)	ND	µg/L	1.0						
Trichlorofluoromethane	ND	µg/L	1.0						
1,2,3-Trichloropropane	ND	µg/L	2.0						
Vinyl chloride	ND	µg/L	1.0						

Qualifiers:

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

QA/QC SUMMARY REPORT

Client: Basin Engineering, Inc.
Project: Shamrock #63 **Work Order:** 0711295

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 8260B: VOLATILES									
Sample ID: 5mL rb		*MBLK*			Batch ID:	**R26175**	Analysis Date:	11/21/2007 7:53:55 AM	
Xylenes, Total	ND	µg/L	1.5						
Sample ID: 100ng lcs		*LCS*			Batch ID:	**R26167**	Analysis Date:	11/21/2007 12:33:26 AM	
Benzene	21.04	µg/L	1.0	105	72.4	126			
Toluene	21.68	µg/L	1.0	108	79.2	115			
Chlorobenzene	20.78	µg/L	1.0	104	83.1	111			
1,1-Dichloroethene	21.88	µg/L	1.0	109	81.4	122			
Trichloroethene (TCE)	18.81	µg/L	1.0	94.1	64.4	118			
Sample ID: 100ng lcs		*LCS*			Batch ID:	**R26175**	Analysis Date:	11/21/2007 9:05:03 AM	
Benzene	20.21	µg/L	1.0	101	72.4	126			
Toluene	20.87	µg/L	1.0	104	79.2	115			
Chlorobenzene	21.14	µg/L	1.0	106	83.1	111			
1,1-Dichloroethene	20.59	µg/L	1.0	103	81.4	122			
Trichloroethene (TCE)	18.34	µg/L	1.0	91.7	64.4	118			

Qualifiers:

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

QA/QC SUMMARY REPORT

Client: Basin Engineering, Inc.
Project: Shamrock #63 **Work Order:** 0711295

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 8310: PAHs									
Sample ID: MB-14439		*MBLK*			Batch ID:	**14439**	Analysis Date:	11/21/2007 3:59:34 PM	
Naphthalene	ND	µg/L	2.0						
1-Methylnaphthalene	ND	µg/L	2.0						
2-Methylnaphthalene	ND	µg/L	2.0						
Acenaphthylene	ND	µg/L	2.5						
Acenaphthene	ND	µg/L	5.0						
Fluorene	ND	µg/L	0.80						
Phenanthrene	ND	µg/L	0.60						
Anthracene	ND	µg/L	0.60						
Fluoranthene	ND	µg/L	0.30						
Pyrene	ND	µg/L	0.30						
Benz(a)anthracene	ND	µg/L	0.050						
Chrysene	ND	µg/L	0.20						
Benzo(b)fluoranthene	ND	µg/L	0.10						
Benzo(k)fluoranthene	ND	µg/L	0.020						
Benzo(a)pyrene	ND	µg/L	0.030						
Dibenz(a,h)anthracene	ND	µg/L	0.040						
Benzo(g,h,i)perylene	ND	µg/L	0.080						
Indeno(1,2,3-cd)pyrene	ND	µg/L	0.080						
Sample ID: MB-14439		*MBLK*			Batch ID:	**14439**	Analysis Date:	11/26/2007 9:42:38 PM	
Naphthalene	ND	µg/L	2.0						
1-Methylnaphthalene	ND	µg/L	2.0						
2-Methylnaphthalene	ND	µg/L	2.0						
Acenaphthylene	ND	µg/L	2.5						
Acenaphthene	ND	µg/L	5.0						
Fluorene	ND	µg/L	0.80						
Phenanthrene	ND	µg/L	0.60						
Anthracene	ND	µg/L	0.60						
Fluoranthene	ND	µg/L	0.30						
Pyrene	ND	µg/L	0.30						
Benz(a)anthracene	ND	µg/L	0.050						
Chrysene	ND	µg/L	0.20						
Benzo(b)fluoranthene	ND	µg/L	0.10						
Benzo(k)fluoranthene	ND	µg/L	0.020						
Benzo(a)pyrene	ND	µg/L	0.030						
Dibenz(a,h)anthracene	ND	µg/L	0.040						
Benzo(g,h,i)perylene	ND	µg/L	0.080						
Indeno(1,2,3-cd)pyrene	ND	µg/L	0.080						
Sample ID: LCS-14439		*LCS*			Batch ID:	**14439**	Analysis Date:	11/21/2007 4:47:34 PM	
Naphthalene	24.00	µg/L	2.0	60.0	33.9	87.9			
1-Methylnaphthalene	23.17	µg/L	2.0	57.8	35.2	85			
2-Methylnaphthalene	23.24	µg/L	2.0	58.1	33.7	83.9			
Acenaphthylene	30.32	µg/L	2.5	75.6	55	97.9			
Acenaphthene	26.09	µg/L	5.0	65.2	42.2	86.6			
Fluorene	2.620	µg/L	0.80	65.3	47.3	85.1			

Qualifiers:

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

QA/QC SUMMARY REPORT

Client: Basin Engineering, Inc.
Project: Shamrock #63 **Work Order:** 0711295

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 8310: PAHs									
Sample ID: LCS-14439		*LCS*			Batch ID:	**14439**	Analysis Date:	11/21/2007 4:47:34 PM	
Phenanthrene	1.590	µg/L	0.60	79.1	53.5	97.3			
Anthracene	1.440	µg/L	0.60	71.6	53.6	93.7			
Fluoranthene	3.070	µg/L	0.30	76.6	60.1	98.5			
Pyrene	3.340	µg/L	0.30	83.3	57.5	108			
Benz(a)anthracene	0.3000	µg/L	0.050	74.8	57.7	106			
Chrysene	1.610	µg/L	0.20	80.1	59.1	112			
Benzo(b)fluoranthene	0.4300	µg/L	0.10	85.8	67	110			
Benzo(k)fluoranthene	0.2000	µg/L	0.020	80.0	63.2	106			
Benzo(a)pyrene	0.2200	µg/L	0.030	79.7	49.7	109			
Dibenz(a,h)anthracene	0.4500	µg/L	0.040	89.8	54.1	111			
Benzo(g,h,i)perylene	0.4600	µg/L	0.080	92.0	51.3	111			
Indeno(1,2,3-cd)pyrene	0.8720	µg/L	0.080	87.0	52.3	103			
Sample ID: LCS-14439		*LCS*			Batch ID:	**14439**	Analysis Date:	11/26/2007 10:30:37 PM	
Naphthalene	22.99	µg/L	2.0	57.5	33.9	87.9			
1-Methylnaphthalene	23.14	µg/L	2.0	57.7	35.2	85			
2-Methylnaphthalene	23.24	µg/L	2.0	58.1	33.7	83.9			
Acenaphthylene	31.67	µg/L	2.5	79.0	55	97.9			
Acenaphthene	25.84	µg/L	5.0	64.6	42.2	86.6			
Fluorene	2.740	µg/L	0.80	68.3	47.3	85.1			
Phenanthrene	1.490	µg/L	0.60	74.1	53.5	97.3			
Anthracene	1.420	µg/L	0.60	70.6	53.6	93.7			
Fluoranthene	3.010	µg/L	0.30	75.1	60.1	98.5			
Pyrene	3.090	µg/L	0.30	77.1	57.5	108			
Benz(a)anthracene	0.3200	µg/L	0.050	79.8	57.7	106			
Chrysene	1.640	µg/L	0.20	81.6	59.1	112			
Benzo(b)fluoranthene	0.4100	µg/L	0.10	81.8	67	110			
Benzo(k)fluoranthene	0.2000	µg/L	0.020	80.0	63.2	106			
Benzo(a)pyrene	0.1900	µg/L	0.030	75.7	49.7	109			
Dibenz(a,h)anthracene	0.4300	µg/L	0.040	85.8	54.1	111			
Benzo(g,h,i)perylene	0.4100	µg/L	0.080	82.0	51.3	111			
Indeno(1,2,3-cd)pyrene	0.9010	µg/L	0.080	89.9	52.3	103			
Sample ID: LCSD-14439		*LCSD*			Batch ID:	**14439**	Analysis Date:	11/21/2007 5:35:33 PM	
Naphthalene	25.16	µg/L	2.0	62.9	33.9	87.9	4.72	32.1	
1-Methylnaphthalene	24.52	µg/L	2.0	61.1	35.2	85	5.66	32.7	
2-Methylnaphthalene	24.69	µg/L	2.0	61.7	33.7	83.9	6.07	34	
Acenaphthylene	30.56	µg/L	2.5	76.2	55	97.9	0.782	38.8	
Acenaphthene	26.38	µg/L	5.0	66.0	42.2	86.6	1.11	38.6	
Fluorene	2.590	µg/L	0.80	64.6	47.3	85.1	1.15	29.3	
Phenanthrene	1.410	µg/L	0.60	70.1	53.5	97.3	12.0	25	
Anthracene	1.350	µg/L	0.60	67.2	53.6	93.7	6.45	23.9	
Fluoranthene	2.860	µg/L	0.30	71.3	60.1	98.5	7.08	15.7	
Pyrene	3.000	µg/L	0.30	74.8	57.5	108	10.7	15.3	
Benz(a)anthracene	0.3100	µg/L	0.050	77.3	57.7	106	3.28	19	
Chrysene	1.490	µg/L	0.20	74.1	59.1	112	7.74	16.6	

Qualifiers:

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

QA/QC SUMMARY REPORT

Client: Basin Engineering, Inc.
Project: Shamrock #63 **Work Order:** 0711295

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 8310: PAHs									
Sample ID: LCSD-14439		*LCSD*			Batch ID:	**14439**	Analysis Date:	11/21/2007 5:35:33 PM	
Benzo(b)fluoranthene	0.4100	µg/L	0.10	81.8	67	110	4.76	21.7	
Benzo(k)fluoranthene	0.1800	µg/L	0.020	72.0	63.2	106	10.5	19.4	
Benzo(a)pyrene	0.2000	µg/L	0.030	71.7	49.7	109	9.52	16.7	
Dibenz(a,h)anthracene	0.4000	µg/L	0.040	79.8	54.1	111	11.8	17.3	
Benzo(g,h,i)perylene	0.4200	µg/L	0.080	84.0	51.3	111	9.09	18	
Indeno(1,2,3-cd)pyrene	0.8270	µg/L	0.080	82.5	52.3	103	5.30	17.7	
Sample ID: LCSD-14439		*LCSD*			Batch ID:	**14439**	Analysis Date:	11/26/2007 11:18:36 PM	
Naphthalene	25.07	µg/L	2.0	62.7	33.9	87.9	8.66	32.1	
1-Methylnaphthalene	24.18	µg/L	2.0	60.3	35.2	85	4.40	32.7	
2-Methylnaphthalene	24.48	µg/L	2.0	61.2	33.7	83.9	5.20	34	
Acenaphthylene	32.88	µg/L	2.5	82.0	55	97.9	3.76	38.8	
Acenaphthene	26.22	µg/L	5.0	65.6	42.2	86.6	1.46	38.6	
Fluorene	2.740	µg/L	0.80	68.3	47.3	85.1	0	29.3	
Phenanthrene	1.400	µg/L	0.60	69.7	53.5	97.3	6.23	25	
Anthracene	1.380	µg/L	0.60	68.7	53.6	93.7	2.86	23.9	
Fluoranthene	2.940	µg/L	0.30	73.3	60.1	98.5	2.35	15.7	
Pyrene	2.980	µg/L	0.30	74.3	57.5	108	3.62	15.3	
Benz(a)anthracene	0.3200	µg/L	0.050	79.8	57.7	106	0	19	
Chrysene	1.530	µg/L	0.20	76.1	59.1	112	6.94	16.6	
Benzo(b)fluoranthene	0.4100	µg/L	0.10	81.8	67	110	0	21.7	
Benzo(k)fluoranthene	0.1900	µg/L	0.020	76.0	63.2	106	5.13	19.4	
Benzo(a)pyrene	0.1700	µg/L	0.030	67.7	49.7	109	11.1	16.7	
Dibenz(a,h)anthracene	0.4100	µg/L	0.040	81.8	54.1	111	4.76	17.3	
Benzo(g,h,i)perylene	0.4000	µg/L	0.080	80.0	51.3	111	2.47	18	
Indeno(1,2,3-cd)pyrene	0.9350	µg/L	0.080	93.3	52.3	103	3.70	17.7	

Qualifiers:

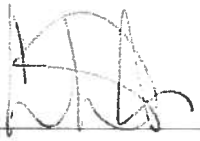
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	S	Spike recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name BASIN DURANGO | Date Received: 11/19/2007

Work Order Number 0711295 | Received by: AT

Checklist completed by:  11/19/07 | Sample ID labels checked by _____ Initials

Signature | Date

Matrix | Carrier name Client drop-off

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☐	Not Shipped ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	N/A ☑	
Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☑	No ☐		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
All samples received within holding time?	Yes ☑	No ☐		
Water - VOA vials have zero headspace?	No VOA vials submitted ☐	Yes ☑	No ☐	
Water - Preservation labels on bottle and cap match?	Yes ☐	No ☐	N/A ☑	
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑	
Container/Temp Blank temperature?	**20°**	*<6° C Acceptable* If given sufficient time to cool.		

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding _____

Comments: _____

Corrective Action _____

CHAIN-OF-CUSTODY RECORD

QA / QC Package:
Std ☐ Level 4 ☐
Other: _____

Client: Basin Engineering

Project Name: Shamrock #63

Address: PO Box 3909
Durango, CO 81302

Project #: 0301-16

Project Manager: John Casey

Phone #: 970 259 2078

Sampler: [signature]

Fax #: 970 385 4812

Sample Temperature: on ice 20°

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative			HEAL No.
					$HgCl_2$	HNO_3	HCl	0711295
11-16-07	13:30	Aqu	MW-1	3-40ml			X	1
11-16-07	13:30	Aqu	MW-1	1-1L				1

ANALYSIS REQUEST

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	EDC (Method 8021)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F, Cl, NO_3, NO_2, PO_4, SO_4)	8081 Pesticides / PCB's (8082)	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles or Headspace (Y or N)
						~~X~~				X						
						X										

Date	Time	Relinquished By: (Signature)	Received By: (Signature)
11-16-07	14:30	[signature]	[signature]
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)
			11/16/07 ICH

Remarks:

HALL ENVIRONMENTAL ANALYSIS LABORATORY
4901 Hawkins NE, Suite D
Albuquerque, New Mexico 87109
Tel. 505.345.3975 Fax 505.345.4107
www.hallenvironmental.com

APPENDIX C
Standard Operating Procedures

Heated Headspace Field Screening Method for Soil Samples

All field activities will be conducted in accordance with the New Mexico Environment Department (NMED) Petroleum Storage Tank Regulations (20.5 NMAC), including Section 1.0; Soil and Groundwater Sampling and Disposal, found in the New Mexico Underground Storage Tank Bureau Guidelines for Corrective Action (March 13, 2000).

Soil samples to be screened in the field shall be placed in a sixteen (16)-ounce (or larger) clean glass jar until approximately one-half full. Clean aluminum foil shall be placed over the top of the jar and secured with the lid ring (or equivalent).

The sample shall not be evaluated until it reaches a temperature of at least 60 degrees Fahrenheit but shall not be allowed to reach a temperature in excess of 80 degrees Fahrenheit. When working in cold weather conditions, samples may be warmed to the appropriate evaluation temperature by placing them inside a heated vehicle. Samples shall be protected from exposure to direct sunlight.

Aromatic hydrocarbon vapor concentrations shall be allowed to develop for at least five (5) minutes prior to evaluating each sample. Samples shall be shaken vigorously to assist the development of vapors in the headspace.

After allowing sufficient time for the development of vapors in the headspace, the foil cover of the sample container shall be pierced using the probe of a photo-ionization detector (PID). The highest measurement of headspace vapors in parts per million (ppm) shall be recorded for each sample.

After evaluating the sample and recording the highest measurement of headspace vapors, the sample and the aluminum foil lid shall be disposed of properly. The sample container may be reused after it has been properly cleaned.

Soil Sample Collection Using Methanol Extraction

All field activities will be conducted in accordance with the New Mexico Environment Department (NMED) Petroleum Storage Tank Regulations (20.5 NMAC), including Section 1.0; Soil and Groundwater Sampling and Disposal, found in the New Mexico Underground Storage Tank Bureau Guidelines for Corrective Action (March 13, 2000).

Each soil sample collected shall be representative of the area intended for laboratory analysis. Soil samples may be collected from a backhoe bucket, split spoon sampler or the bottom or sidewall of an excavation only after the soil surface has been scraped away to expose fresh soil. The soil sample shall be collected using a disposable plastic syringe supplied by the laboratory. The graduated syringe shall be filled with approximately ten (10) cubic centimeters (cc) of fresh soil from the intended sample location.

Working carefully but quickly, the screw cap shall be removed from a twenty (20) milliliter (ml) glass sample vial containing methanol (supplied by the laboratory) and the soil sample shall be pushed from the syringe into the vial, taking care not to allow soil particles to adhere to the rim of the vial. The screw cap shall be replaced on the 20 ml glass vial containing the sample and tightened securely. Once the screw cap is secure, the sample shall be gently agitated to completely immerse the soil in the methanol. Excessive agitation of the sample shall be avoided.

Two (2) 40 ml sample vials containing soil and methanol shall be prepared in the field for each intended soil sample location. In addition to the 40 ml sample vials, a minimum of twenty (20) grams of dry soil (no methanol added) from each intended soil sample location shall be placed in a clean four (4) –ounce glass sample jar supplied by the laboratory. The labels on all three (3) sample containers shall correspond to one soil sample location.

All labeled soil sample containers shall be placed under ice in an insulated storage chest, and sealed with custody tape. The collected soil samples will be delivered with chain-of-custody documentation to a certified laboratory. The soil samples will be analyzed by the certified laboratory in accordance with the appropriate EPA Methodology.

Monitoring Well Installation

Upon borehole completion, a 2-inch diameter, Schedule 40 PVC pipe with a 15-foot (20 foot maximum) section of 0.010-inch slotted screen with a sediment sump and cap on the bottom will be lowered into and centered in each borehole. The well materials will be placed such that the top of the slotted screen is approximately 5 ft above the existing water table. Coarse grained (10/20) silica sand will be backfilled below and around the well screen to a depth of approximately 2 feet above and 2 feet below the screened interval. A filter pack seal will be placed extending 1 foot above the filter pack when appropriate. A bentonite seal, having an approximate thickness of 1.5 feet and consisting of hydrated bentonite pellets, will be constructed on top of the silica sand pack or filter pack seal. The remainder of the borehole will be backfilled with cement grout having a minimum five percent bentonite content to within approximately one foot of the top of the PVC well casing. The remainder of the backfill, approximately 12 inches, will consist of concrete. The top of the well casing will be terminated below grade, sealed with a lockable water-tight cap, and covered with a traffic-rated, steel protective well cover. A concrete slab of a minimum two (2) foot radius and six (6) inches thick will be poured around the well cover and sloped so that rainfall and runoff flows away from the well. Well completion logs including lithologic logs for the new monitoring wells will be included in the report.

The new monitoring wells will be developed first by surging the well for 5 to 10 minutes throughout the length of the well screen with a bailer or slug, followed by removal of the ground water and sediment from the well with a bailer. Each well will be surged and bailed in this manner until pH, temperature and specific conductivity readings stabilize and turbidity is reduced to the greatest extent possible.

Ground Water Sampling

All field activities will be conducted in accordance with the New Mexico Environment Department (NMED) Petroleum Storage Tank Regulations (20.5 NMAC), including Section 1.0; Soil and Groundwater Sampling and Disposal, found in the New Mexico Underground Storage Tank Bureau Guidelines for Corrective Action (March 13, 2000).

The NMED Petroleum Storage Tank Bureau (PSTB) Project Manager will be notified of the intent to sample the site at least ninety-six (96) hours in advance of the scheduled monitoring event.

Prior to sampling, an electronic interface probe will be used to measure the water levels and total depths of the monitoring wells to be sampled. These data will be used to calculate casing volumes of water for each well. The interface probe will also indicate if free phase hydrocarbons are present in the well. If free phase hydrocarbons are detected, the well will not be purged or sampled. If free phase hydrocarbons are not detected, the well will be purged using an HDPE disposable bailer to remove three casing volumes of water or, if the well is completed in a low transmissivity formation, water will be removed until the well is dry. Disposal of purged water will take place within the site property boundary on an impervious surface (if possible) near the well of origin. When specifically required by a Work Plan, purged water will be placed in a water-tight container and transported to an approved disposal or recycling facility.

After purging, the sample bailer will be used to transfer the ground water to sample bottles containing the appropriate preservative (if required). The sample bottles will then be labeled, placed under ice in an insulated storage chest, and sealed with custody tape. Ground water samples will be delivered with chain-of-custody documentation to a certified laboratory. The ground water samples will be analyzed by the certified laboratory in accordance with the appropriate EPA Methodology.

Water quality parameters including pH, temperature, specific conductance, total dissolved solids and dissolved oxygen will be measured immediately prior to sample collection. The date and time of sample collection, weather conditions, volume of water in the well, volume of water purged prior to sampling, physical sample descriptions (including turbidity, color and odor), other pertinent observations, and water quality measurements will be recorded on Ground Water Monitoring Data Sheets.