Whole Earth Environmental, Inc.
2103 Arbor Cove
Katy, Tx. 77494
281.394.2050
whearth@msn.com

January 4, 2012

NMOCD
1625 No. French Dr.
Hobbs, NM 88241

Attn: Geoffrey Leking

Reference: 1RP-2759

Dear Mr. Leking:

Enclosed, please find a copy of our remediation protocol for the Chaparral Energy WDSQU-Sat. #2 spill located in Unit Letter P, Section 30, Township 24S, Range 38E. Though the newly reported spill contained minimum volumes, it came atop previous events with significant vertical migration.

The attached laboratory analytical report from Cardinal indicates that the affected area cleans up at a maximum depth of 75' below ground surface. Our protocol describes the excavation and commercial disposal of the highly contaminated soils to a depth of 5' followed by the installation of a geo-synthetic liner and backfill with fresh topsoils.

Thank you for your guidance and personal attention to this project.

Warmest personal regards,

Mike Griffin
President
Whole Earth Environmental, Inc.

1RP-2759 pGRL1131930164

Executive Summary

Location

The site is located approximately seven miles northeast of the City of Jal, Lea County, New Mexico on fee lands. The primary land use is grazing of cattle however extensive oil and gas operations are prevalent in the area. The area is semi-arid with a net precipitation / evaporation amount of –73" per year.

.

Spill Event

The seep of approximately 10 barrels of saltwater from was discovered on July 28, 2011. The breach occurred due to corroded lines. The lines have all been subsequently replaced. Approximately 2 barrels of fluid were recovered by vacuum truck.

Investigation Activities

The ground surface is caliche and hard pan soils allowing the newest leak to migrate in slender tendrils to a maximum distance of approximately 500' from the leak source. The width of these tendrils varies from 1' to 5'. Due to the obvious surface staining, an electromagnetic survey was performed.

The site was initially bored by Atkins Engineering to a maximum depth of 80' below ground surface at which point the chloride concentrations met the NMOCD acceptance standards. According to the 2005 Chevron/Texaco hydrology data, the depth to groundwater is estimated to be 200' below ground surface.

Remediation Activities

We propose to excavate and commercially dispose of all soils within the deeply affected area to a minimum depth of 5' below ground surface and installing a geo-textile liner. The superficially impacted soils will be tested and either commercially disposed of or will be mixed and blended with fresh soils to achieve the NMOCD closure standards.

Exhibit Index

1. Initial C-141
2. Driving Instructions
3. Satellite overview of the site
4. Spill Outline
5. EM38 Survey Site Map
6. Chevron/Texaco Water Depth Map Detail
7. Boring Logs

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised October 10, 2003

Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: Chaparral Energy Co. LLC	Contact: Derek E. Presley
Address: 701 Cedar Lake Blvd. Oklahoma City, OK 73114	Telephone No.: (405) 426-4091 X 1491
Facility Name: WDQSU Sat. #2	Facility Type: INJECTION HEADER

Surface Owner: Bill Grobe	Mineral Owner	Lease No.:

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
P	30	24S	38E	1,310'	SOUTH	802'	EAST	LEA

Latitude: 32.184706 Longitude: -103.093690

NATURE OF RELEASE

Type of Release: Produce water and oil	Volume of Release: 10bbls	Volume Recovered: 2bbls
Source of Release: 2" steel flow line ruptured 15' W. of header	Date and Hour of Occurrence: 11-4-11	Date and Hour of Discovery: 1:30pm
Was Immediate Notice Given? ☐ Yes ☒ No ☐ Not Required	If YES, To Whom?	
By Whom? Roy R. Rascon w/WEE / ET of NM, notified Geoffery L. @ NMOCD office	Date and Hour: 11-8-11 @ approx. 2:30	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

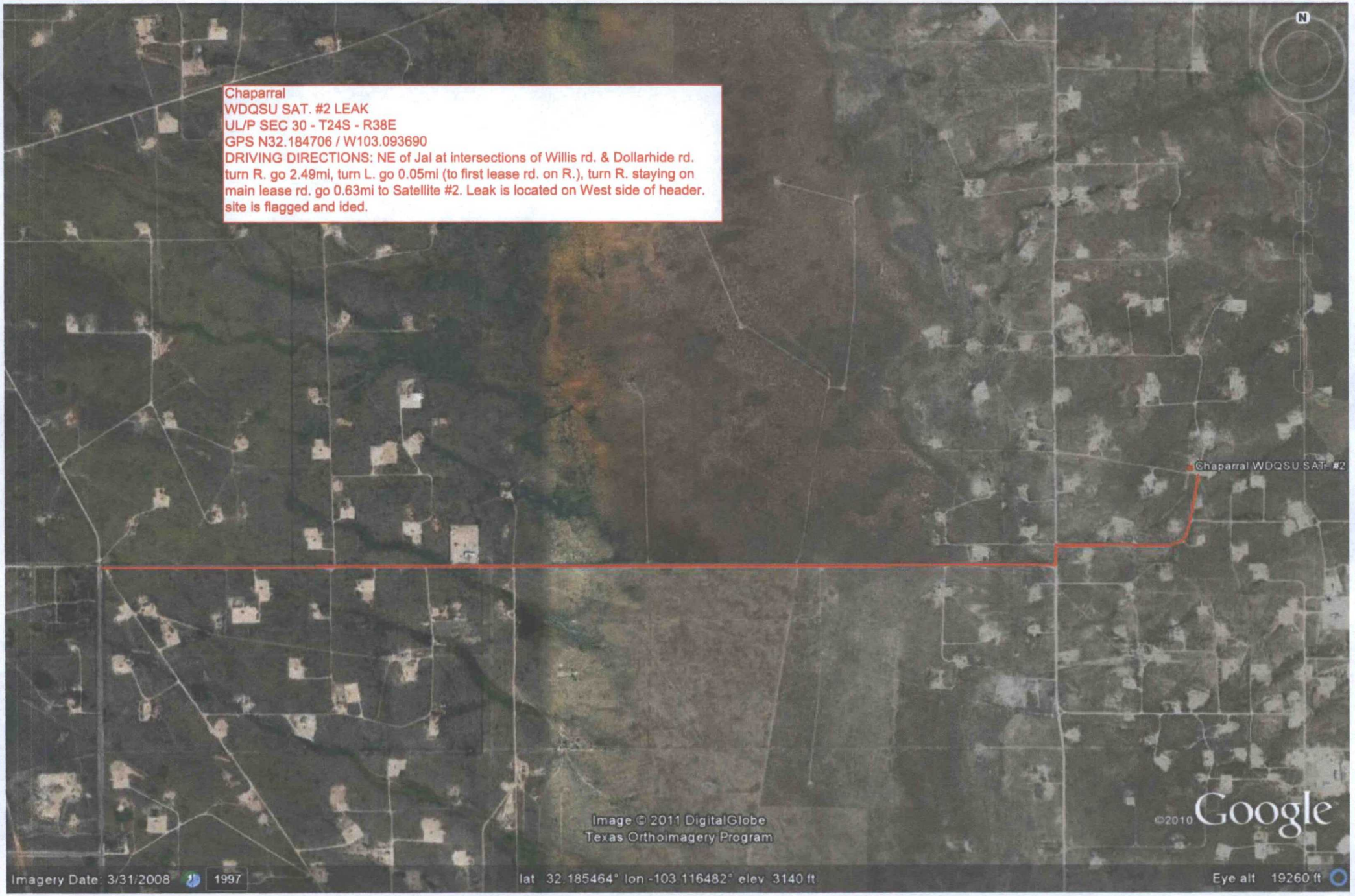
Describe Cause of Problem and Remedial Action Taken.*
2" steel line from header to well, ruptured, leak source isolated, line removed for repair, new line installed on 11-8-11. Vacuum truck called in but only recovered about 2 bbls. of water.

Describe Area Affected and Cleanup Action Taken.*
Area affected is due west of header approx. size 80'n&s x 35'e&w, with puddle area in road area to south of header, one finger running to the south about 500'L with various width from 6' to 1'wide, and a separate finger on the lease rd going west about 400'L, with various widths from 6' to 1'wide. WEE / ET of NM contacted to investigate site and em leak area. Site will be delineated in accordance NMOCD regs.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature:	OIL CONSERVATION DIVISION
Printed Name: Derek E. Presley	Approved by ~~District Supervisor~~: ENV ENGINEER Geoffrey Leking
Title: Safety Specialist	Approval Date: 11/14/11 Expiration Date: 01/17/12
E-mail Address: derek.presley@chaparralenergy.com	Conditions of Approval: SUBMIT FINAL C-141 BY 01/17/12 Attached ☐ IRP-11-11-2759
Date: 11/9/11 Phone: (405) 426-4091 X 1491	

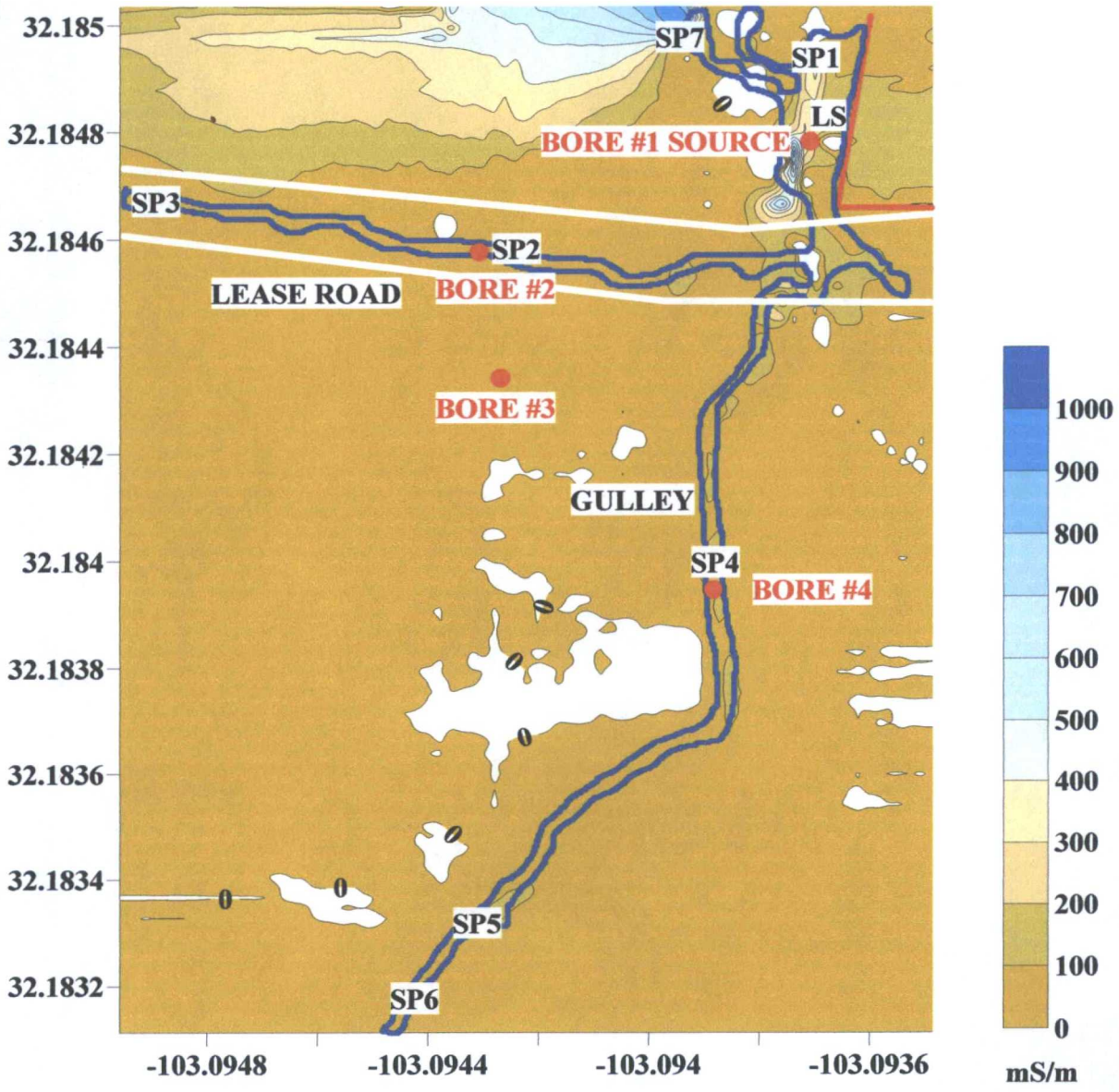
* Attach Additional Sheets If Necessary


Chaparral
WDQSU SAT. #2 LEAK
UL/P SEC 30 - T24S - R38E
GPS N32.184706 / W103.093690
DRIVING DIRECTIONS: NE of Jal at intersections of Willis rd. & Dollarhide rd. turn R. go 2.49mi, turn L. go 0.05mi (to first lease rd. on R.), turn R. staying on main lease rd. go 0.63mi to Satellite #2. Leak is located on West side of header. site is flagged and ided.
N
Chaparral WDQSU SAT. #2
Image © 2011 DigitalGlobe
Texas Orthoimagery Program
©2010 Google
Imagery Date: 3/31/2008
1997
lat 32.185464° lon -103.116482° elev 3140 ft
Eye alt 19260 ft

BORE 1
SB-1
WDQSU SAT. #2
BORE #3
BG
SP-4
© 2011 Google
Imagery Date: 11/14/2011
1996
lat 32.184313° lon -103.093627° elev 3161 ft


Chaparral WDQSU SAT. #2
ASPHALT LANE
10X10
SB-4
©2011 Google
Texas Orthoimagery Program
Imagery Date: 3/31/2008
1996
lat 32.183925° lon -103.093407° elev 3159 ft

Chaparral
WDQSU SAT. #2 LEAK
UL/P SEC 30 - T24S - R38E
DEPTH TO GW: +/- 200'BGS
EM38 SURVEY SITE MAP



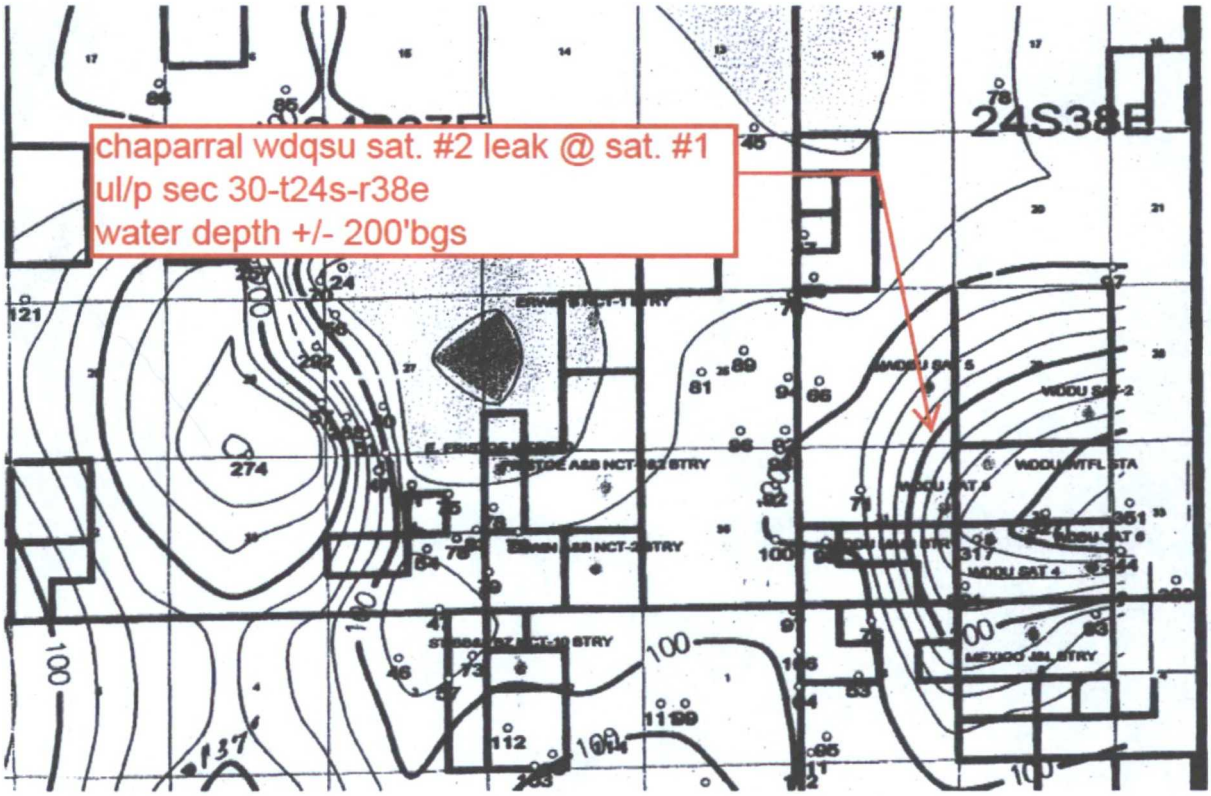
Chaparral Energy LLC.

WDQSU Sat. #2 Leak

UL/P SEC -30 – T24S – R38E

DEPTH TO GROUNDWATER ACCORDING TO CHEVRON / TEXACO 2005 WATER DATA MAPS

+/- 200'BGS



Log of Boring 1 Source

Atkins ENGINEERING ASSOCIATES

Whole Earth Environmental 2103 Arbor Cove Katy, TX 77494	Date	: 11/30/11	Auger Type : 3¼ Hollow Stem
	Drill Start	: 08:30	Logged By : K. Bates
	Drill End	: 13:30	
Contact: Mike Griffin	Boring Location	: 32°12'60"N, 103°11'35"W	
Job # WEWDQS2.MWD.11	Site Location	:	

Depth in Feet	GRAPHIC	USCS	Sample	DESCRIPTION
0		CL		Sandy clay, brownish red, loose, dry
65		SS		Sandstone, light tan and red, firm, damp
70		CL		Clay, red, firm
80				Total depth 80'
85				

12-28-2011 C:\Users\Paddy\Documents\Whole Earth\WEWDQS2\11.bor

Atkins ENGINEERING ASSOCIATES

Log of Boring 2

Whole Earth Environmental 2103 Arbor Cove Katy, TX 77494	Date	: 11/30/11	Auger Type	: 3¼ Hollow Stem
	Drill Start	: 14:00	Logged By	: K. Bates
	Drill End	: 15:30		
Contact: Mike Griffin	Boring Location	: 32°12'60"N, 103°11'35"W		
Job # WEWDQS2.MWD.11	Site Location	:		

Depth in Feet	GRAPHIC	USCS	Sample	DESCRIPTION
0				Sandy clay with caliche, tan, loose, dry
5		CL		
10				
15				Total Depth 15'
20				

12-28-2011 C:\Users\Paddy\Documents\Whole Earth\WEWDQS2\2.bor

Atkins ENGINEERING ASSOCIATES

Log of Boring 3

Whole Earth Environmental 2103 Arbor Cove Katy, TX 77494	Date	: 12/1/11	Auger Type	: 3¼ Hollow Stem
	Drill Start	: 14:30	Logged By	: K. Bates
	Drill End	: 15:00		
Contact: Mike Griffin	Boring Location	: 32°11'4"N, 103°5'39"W		
Job # WEWDQS2.MWD.11	Site Location	:		

Depth in Feet	GRAPHIC	USCS	Sample	DESCRIPTION
0				Clay with caliche, light tan, loose, dry
5		CL		
10				
15				Total Depth 15'
20				

01-04-2012 C:\Users\Paddy\Documents\Whole Earth\WEWDQS2\3rev.bor

Log of Boring 4

Atkins ENGINEERING ASSOCIATES

Whole Earth Environmental 2103 Arbor Cove Katy, TX 77494	Date	: 12/1/11	Auger Type : 3¼ Hollow Stem
	Drill Start	: 08:00	Logged By : K. Bates
	Drill End	: 14:00	
Contact: Mike Griffin	Boring Location	: 32°11'3"N, 103°5'38"W	
Job # WEWDQS2.MWD.11	Site Location	:	

Depth in Feet	GRAPHIC	USCS	Sample	DESCRIPTION
0–55		SP		Sand, reddish brown, loose, dry
55–65		CL		Sandy clay, reddish brown, loose, dry
65–80		CL		Clay, red, firm
80				Total Depth 80'

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85

01-04-2012 C:\Users\Paddy\Documents\Whole Earth\WEWDQS2\4rev.bor

Field & Laboratory Analytical Data
With Lithological Descriptions

1. Field Titration & Lithological Descriptions
2. Chloride Concentration Summary Graph
3. Cardinal Labs H102613 Deep Boring Results

WEE INC. CL- FIELD TITRATION RESULTS

LOCATION: CHAPPAREL WDQSU SAT. #2 1RP-2759

Sample pt.	Date	Time	Depth	Soil	Water	CF	AGNO3	CL-	PID	SOIL LITHOLOGY
SOURCE	11/8/11	1149	Surface	10	29.1	2.91	4.07	23680	N/A	5YR-4/3 reddish brown sandy sand dry
		1142	0>6"	10	31.5	3.15	0.7	4409	N/A	5YR-4/3 reddish brown sandy sand dry
		1148	2'	10	30.3	3.03	0.35	2120	N/A	5YR-4/3 reddish brown sandy sand dry
B1 (Source)	11/29/11	330	0>3'	10	27.6	2.76	0.16	883	N/A	7.5YR-5/4 brown sandy sand damp
	11/30/11	DEPTH 3'>5'	TIME 852	10	27.5	2.75	0.37	2034	N/A	7.5YR-8/3 pink slightly rocky sand sand damp
		5'	857	10	31	3.10	0.19	1178	N/A	7.5YR-8/4 pink sandy sand damp
		10'	908	10	30.4	3.04	0.2	1216	N/A	2.5YR-7/4 light reddish brown sandy sand damp
		15'	918	10	29.9	2.99	0.24	1435	N/A	7.5YR-8/3 pink sandy sand damp
		20'	927	10	31.8	3.18	0.2	1272	N/A	2.5YR-5/4 reddish brown sandy sand damp
		25'	934	10	30.7	3.07	0.12	737	N/A	2.5YR-5/4 reddish brown sandy sand damp
		30'	943	10	30.8	3.08	0.22	1355	N/A	2.5YR-5/4 reddish brown sandy sand damp
		35'	954	10	29	2.90	0.4	2319	N/A	2.5YR-5/4 reddish brown sandy sand damp
		40'	1006	10	28.5	2.85	0.28	1596	N/A	2.5YR-6/4 light reddish brown sandy sand damp
		45'	1018	10	31.6	3.16	0.26	1643	N/A	2.5YR-6/4 light reddish brown sandy sand damp

		50'	1031	10	29.5	2.95	0.27	1593	N/A	2.5YR-5/8 red sandy sand damp
		55'	1044	10	29.3	2.93	0.24	1406	N/A	2.5YR-5/8 red sandy sand damp
		60'	1057	10	31.6	3.16	0.28	1769	N/A	2.5YR-5/8 red sandy sand damp
		65'	1114	10	29.2	2.92	0.77	4495	N/A	2.5YR-5/8 red sandy sand damp
		70'	1143	10	27	2.70	0.16	2159	N/A	2.5YR-5/8 red sandy sand clayey moist
		75'	1219	10	29.6	2.96	0.04	237	N/A	2.5YR-5/8 red sandy sand clayey dry
		80'	103	10	29.3	2.93	0.04	234	N/A	2.5YR-5/8 red sandy sand clayey dry
SP1	**11/8/11**	1205	Surface	10	30.7	3.07	3.97	24368	N/A	5YR-6/3 light reddish brown slightly rocky sandy sand damp
		1201	0>6'	10	29.3	2.93	0.21	1230	N/A	5YR-4/3 reddish brown sandy sand dry
SP2		1122	Surface	10	30.3	3.03	3.77	22839	N/A	5YR-6/3 light reddish brown slightly rocky sandy sand damp
		1125	0>6"	10	28.1	2.81	0.79	4438	N/A	5YR-6/3 light reddish brown slightly rocky sandy sand damp
B2 (SP2)	**11/30/11**	0>2'	210	10	28.3	2.83	0.49	2773	N/A	7.5YR-5/2 brown slightly rocky sandy sand damp
		2'>5'	214	10	28.4	2.84	0.15	852	N/A	7.5YR-6/3 light brown rocky sandy sand damp
		10'	225	10	29.1	2.91	0.04	233	N/A	2.5YR-8/3 pink sandy sand damp
		15'	232	10	28	2.80	0.04	224	N/A	2.5YR-6/4 light reddish brown sandy sand damp
SP3	**11/8/11**	1118	0>6"	10	30.8	3.08	0.46	2833	N/A	5YR-4/4 reddish brown sandy sand damp
SP4		1023	Surface	10	28.7	2.87	3.06	17559	N/A	5YR-4/4 reddish brown sandy sand damp
		1026	0>6"	10	29.2	2.92	0.87	5079	N/A	5YR-4/4 reddish brown sandy sand damp

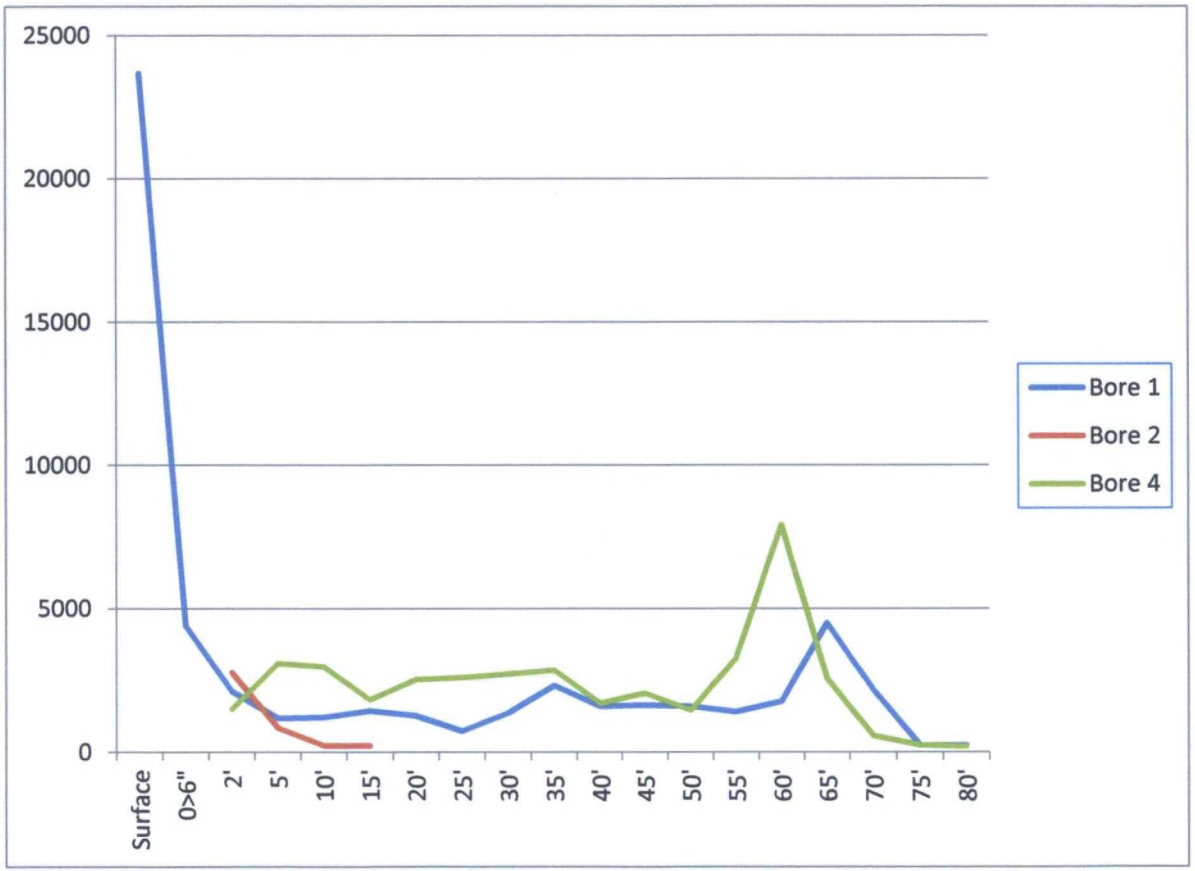
B4 (SP4)	**11/29/11**	340	0>2'	10	27.9	2.79	0.27	1506	N/A	7.5YR-6/3 light brown rocky sandy sand damp
	12/1/11	5'	929	10	29.2	2.92	0.53	3094	N/A	5YR-7/4 pink sandy sand damp
		10'	936	10	29.8	2.98	0.5	2979	N/A	2.5YR-7/6 light red sandy sand camp
		15'	943	10	29.5	2.95	0.31	1828	N/A	2.5YR-5/6 red sandy sand damp
		20'	949	10	27	2.7	0.47	2537	N/A	2.5YR-5/6 red sandy sand damp
		25'	955	10	28.3	2.83	0.46	2603	N/A	2.5YR-5/6 red sandy sand damp
		30'	1004	10	27.2	2.72	0.5	2719	N/A	2.5YR-6/6 light red sandy sand damp
		35'	1014	10	28.6	2.86	0.5	2859	N/A	2.5YR-6/6 light red sandy sand damp
		40'	1022	10	31.7	3.17	0.27	1711	N/A	2.5YR-5/6 red sandy sand damp
		45'	1030	10	29.3	2.93	0.35	2050	N/A	2.5YR-5/6 red sandy sand damp
		50'	1042	10	28.1	2.81	0.26	1461	N/A	2.5YR-5/6 red sandy sand damp
		55'	1053	10	27.2	2.72	0.6	3263	N/A	2.5YR-5/6 red sandy sand damp
		60'	1108	10	28.3	2.83	1.4	7922	N/A	2.5YR-3/4 dark reddish brown sandy sand damp
		65'	1136	10	32	3.2	0.4	2559	N/A	2.5YR-5/6 red sandy clay dry
		70'	1200	10	28.6	2.86	0.1	572	N/A	2.5YR-5/6 red sandy clay dry
		75'	1227	10	30.1	3.01	0.04	241	N/A	2.5YR-5/6 red sandy clay dry
		80'	100	10	33.5	3.35	0.03	201	N/A	2.5YR-5/6 red sandy clay dry
SP5		1002	Surface	10	26.3	2.63	3.7	19456	N/A	5YR-6/4 light reddish brown sandy sand damp

SP6	**11/8/11**	938	Surface	10	30.4	3.04	2.96	17991	N/A	5YR-6/4 light reddish brown sandy sand damp
		940	0>6"	10	30	3.00	2.46	14755	N/A	5YR-3/2 dark reddish brown sandy sand damp
		946	2'	10	26.8	2.68	N/A	######	N/A	5YR-5/3 light reddish brown sandy sand dry sample didn't settle out unable to field
SP7		1153	Surface	10	25.7	2.57	0.2	1028	N/A	5YR-4/3 reddish brown sandy sand dry
		1157	0>6"	10	27.4	2.74	0.21	1150	N/A	5YR-4/3 reddish brown sandy sand dry
B3 Background	**12/1/11**	5'	225	10	36.8	3.68	0.04	294	N/A	7.5YR-8/2 pinkish white rocky sandy sand damp
		10'	237	10	26.1	2.61	0.03	157	N/A	2.5YR-8/3 pink rocky sandy sand damp
		15'	243	10	26.8	2.68	0.03	161	N/A	2.5YR-8/3 pink rocky sandy sand damp

Chaparral Energy WDSQU-2

1RP-2759 Vertical Delineation Field Titration Summary

Depth	Bore 1	Bore 2	Bore 4
Surface	23680		
0>6"	4409		
2'	2120	2773	1506
5'	1178	852	3094
10'	1216	233	2979
15'	1435	224	1828
20'	1272		2535
25'	737		2603
30'	1355		2719
35'	2319		2859
40'	1596		1711
45'	1643		2050
50'	1593		1461
55'	1406		3263
60'	1769		7922
65'	4495		2559
70'	2159		572
75'	237		241
80'	234		201



CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

December 12, 2011

ROY R. RASCON

WHOLE EARTH ENVIRONMENTAL, INC.

2103 ARBOR COVE

KATY, TX 77494

RE: CHAPPAREL WDQSU SAT #2 1RP-2759

Enclosed are the results of analyses for samples received by the laboratory on 12/07/11 9:34.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method SW-846 8260	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method TX 1005	Total Petroleum Hydorcarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

WHOLE EARTH ENVIRONMENTAL, INC.
ROY R. RASCON
2103 ARBOR COVE
KATY TX, 77494
Fax To: (281) 394-2051

Received:	12/07/2011	Sampling Date:	11/30/2011
Reported:	12/12/2011	Sampling Type:	Soil
Project Name:	CHAPPAREL WDQSU SAT #2 1RP-2759	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: B1 (SOURCE) 3' >5' (H102613-01)

BTEX 8021B mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/08/2011	ND	2.00	100	2.00	0.748	
Toluene*	<0.050	0.050	12/08/2011	ND	1.95	97.4	2.00	0.380	
Ethylbenzene*	<0.050	0.050	12/08/2011	ND	2.24	112	2.00	0.550	
Total Xylenes*	<0.150	0.150	12/08/2011	ND	6.51	109	6.00	0.285	

Surrogate: 4-Bromofluorobenzene (PIL *113 %* *64.4-134*

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2560**	16.0	12/08/2011	ND	416	104	400	0.00	

TPH 8015M mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	12/08/2011	ND	177	88.7	200	3.39	
DRO >C10-C28	<10.0	10.0	12/08/2011	ND	157	78.7	200	5.35	

Surrogate: 1-Chlorooctane *88.4 %* *55.5-154*

Surrogate: 1-Chlorooctadecane *72.0 %* *57.6-158*

Sample ID: B1 (SOURCE) @ 25' (H102613-02)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**688**	16.0	12/08/2011	ND	416	104	400	0.00	

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

WHOLE EARTH ENVIRONMENTAL, INC.
ROY R. RASCON
2103 ARBOR COVE
KATY TX, 77494
Fax To: (281) 394-2051

Received:	12/07/2011	Sampling Date:	11/30/2011
Reported:	12/12/2011	Sampling Type:	Soil
Project Name:	CHAPPAREL WDQSU SAT #2 1RP-2759	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: B1 (SOURCE) @ 80' (H102613-03)

BTEX 8021B mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/08/2011	ND	2.00	100	2.00	0.748	
Toluene*	<0.050	0.050	12/08/2011	ND	1.95	97.4	2.00	0.380	
Ethylbenzene*	<0.050	0.050	12/08/2011	ND	2.24	112	2.00	0.550	
Total Xylenes*	<0.150	0.150	12/08/2011	ND	6.51	109	6.00	0.285	

Surrogate: 4-Bromofluorobenzene (PIL *110 %* *64.4-134*

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	12/08/2011	ND	416	104	400	0.00	

TPH 8015M mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	12/08/2011	ND	177	88.7	200	3.39	
DRO >C10-C28	<10.0	10.0	12/08/2011	ND	157	78.7	200	5.35	

Surrogate: 1-Chlorooctane *90.8 %* *55.5-154*

Surrogate: 1-Chlorooctadecane *70.7 %* *57.6-158*

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

WHOLE EARTH ENVIRONMENTAL, INC.
ROY R. RASCON
2103 ARBOR COVE
KATY TX, 77494
Fax To: (281) 394-2051

Received:	12/07/2011	Sampling Date:	11/30/2011
Reported:	12/12/2011	Sampling Type:	Soil
Project Name:	CHAPPAREL WDQSU SAT #2 1RP-2759	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: B2 (SP2) @ 15' (H102613-04)

BTEX 8021B mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/08/2011	ND	2.00	100	2.00	0.748	
Toluene*	<0.050	0.050	12/08/2011	ND	1.95	97.4	2.00	0.380	
Ethylbenzene*	<0.050	0.050	12/08/2011	ND	2.24	112	2.00	0.550	
Total Xylenes*	<0.150	0.150	12/08/2011	ND	6.51	109	6.00	0.285	

Surrogate: 4-Bromofluorobenzene (PIL *111 %* *64.4-134*

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	12/08/2011	ND	416	104	400	0.00	

TPH 8015M mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	12/08/2011	ND	177	88.7	200	3.39	
DRO >C10-C28	<10.0	10.0	12/08/2011	ND	157	78.7	200	5.35	

Surrogate: 1-Chlorooctane *82.5 %* *55.5-154*

Surrogate: 1-Chlorooctadecane *69.9 %* *57.6-158*

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

WHOLE EARTH ENVIRONMENTAL, INC.
ROY R. RASCON
2103 ARBOR COVE
KATY TX, 77494
Fax To: (281) 394-2051

Received:	12/07/2011	Sampling Date:	12/01/2011
Reported:	12/12/2011	Sampling Type:	Soil
Project Name:	CHAPPAREL WDQSU SAT #2 1RP-2759	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: B4 (SP4) @ 30' (H102613-05)

BTEX 8021B mg/kg **Analyzed By: MS** **S-04**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/08/2011	ND	2.00	100	2.00	0.748	
Toluene*	**0.092**	0.050	12/08/2011	ND	1.95	97.4	2.00	0.380	
Ethylbenzene*	**0.400**	0.050	12/08/2011	ND	2.24	112	2.00	0.550	
Total Xylenes*	**1.20**	0.150	12/08/2011	ND	6.51	109	6.00	0.285	

Surrogate: 4-Bromofluorobenzene (PIL *148 %* *64.4-134*

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

WHOLE EARTH ENVIRONMENTAL, INC.
ROY R. RASCON
2103 ARBOR COVE
KATY TX, 77494
Fax To: (281) 394-2051

Received:	12/07/2011	Sampling Date:	12/01/2011
Reported:	12/12/2011	Sampling Type:	Soil
Project Name:	CHAPPAREL WDQSU SAT #2 1RP-2759	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: B4 (SP4) @ 80' (H102613-06)

BTEX 8021B mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/08/2011	ND	2.00	100	2.00	0.748	
Toluene*	<0.050	0.050	12/08/2011	ND	1.95	97.4	2.00	0.380	
Ethylbenzene*	<0.050	0.050	12/08/2011	ND	2.24	112	2.00	0.550	
Total Xylenes*	<0.150	0.150	12/08/2011	ND	6.51	109	6.00	0.285	

Surrogate: 4-Bromofluorobenzene (PIL *113 %* *64.4-134*

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**96.0**	16.0	12/08/2011	ND	416	104	400	0.00	

TPH 8015M mg/kg **Analyzed By: MS** **S-LOW**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	12/08/2011	ND	177	88.7	200	3.39	
DRO >C10-C28	<10.0	10.0	12/08/2011	ND	157	78.7	200	5.35	

Surrogate: 1-Chlorooctane *72.9 %* *55.5-154*

Surrogate: 1-Chlorooctadecane *56.7 %* *57.6-158*

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

WHOLE EARTH ENVIRONMENTAL, INC.
ROY R. RASCON
2103 ARBOR COVE
KATY TX, 77494
Fax To: (281) 394-2051

Received:	12/07/2011	Sampling Date:	12/01/2011
Reported:	12/12/2011	Sampling Type:	Soil
Project Name:	CHAPPAREL WDQSU SAT #2 1RP-2759	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: B3 (BKGROUND) @ 15' (H102613-07)

BTEX 8021B mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/08/2011	ND	2.00	100	2.00	0.748	
Toluene*	<0.050	0.050	12/08/2011	ND	1.95	97.4	2.00	0.380	
Ethylbenzene*	<0.050	0.050	12/08/2011	ND	2.24	112	2.00	0.550	
Total Xylenes*	<0.150	0.150	12/08/2011	ND	6.51	109	6.00	0.285	

Surrogate: 4-Bromofluorobenzene (PIL *109 %* *64.4-134*

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**96.0**	16.0	12/08/2011	ND	416	104	400	0.00	

TPH 8015M mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	12/08/2011	ND	177	88.7	200	3.39	
DRO >C10-C28	<10.0	10.0	12/08/2011	ND	157	78.7	200	5.35	

Surrogate: 1-Chlorooctane *81.8 %* *55.5-154*

Surrogate: 1-Chlorooctadecane *68.3 %* *57.6-158*

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Notes and Definitions

S-LOW	Low surrogate recovery confirmed as a matrix effect by a second analysis.
S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

Company Name: WEG, Inc	**BILL TO**
Project Manager: Roy Rasco	P.O. #:
Address:	Company:
City: State: Zip:	Attn:
Phone #: Fax #:	Address:
Project #: Project Owner:	City:
Project Name: Chappard #005 Sit #2 1RP-2754	State: Zip:
Project Location:	Phone #:
Sampler Name: Elijah Rasco	Fax #:

FOR LAB USE ONLY				MATRIX							PRESERV.			SAMPLING		ANALYSIS REQUEST												
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	ACID/BASE:	ICE / COOL	OTHER:	DATE	TIME	8015M	BTEX	Cl-											
H1D2613																												
1	B1 (Source) 3'-5'	C				X					X		11-30-11	852	X	X	X											
2	B1 (Source) @ 25'	G				X					X		11-30-11	934			X											
3	B1 (Source) @ 30'	G				X					X		11-30-11	103	X	X	X											
4	B2 (SP2) @ 15'	G				X					X		11-30-11	232	X	X	X											
5	B4 (SP4) @ 30'	G				X					X		12-1-11	1004		X												
6	B4 (SP4) @ 60'	G				X					X		12-1-11	100	X	X	X											
7	B3 (Background) @ 15'	G				X					X		12-1-11	243	X	X	X											

Relinquished By:	Date: 12-7-11	Received By:	Phone Result: ☐ Yes ☐ No Add'l Phone #:
	Time: 934	Jodi Henson	Fax Result: ☐ Yes ☐ No Add'l Fax #:
Relinquished By:	Date:	Received By:	REMARKS: email all
	Time:		

Delivered By: (Circle One)	Sample Condition	CHECKED BY: (Initials)
Sampler - UPS - Bus - Other: 4°c	Cool: ☑ Yes ☐ No Intact: ☑ Yes ☐ No	CA

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476

Remediation and Site Restoration Protocol
Chaparral Energy Co. LLC
WDQSU Sat. #2
1RP-2759

1.0 Purpose

This protocol is to provide a detailed outline of the steps to be employed in the remediation of a produced water & hydrocarbon release impact area in Jal, Lea County, New Mexico.

2.0 Scope

This protocol is site specific for the above project.

3.0 Preliminary

Prior to any field operations, Whole Earth Environmental shall conduct the following activities:

3.1 Client Review

3.1.1 Whole Earth shall meet or communicate with the appointed personnel within Chaparral Energy Co. LLC to review this protocol and make any requested modifications or alterations.

3.1.2 Changes to this protocol will be documented and submitted for final review by Chaparral Energy Co. LLC prior to the initiation of actual fieldwork.

3.1.3 Upon client approval, this protocol and supporting documentation will be submitted to the Hobbs district office of the NMOCD for approval.

4.0 Safety

4.1 Prior to work on the site, Whole Earth shall obtain the location and phone numbers of the nearest emergency medical treatment facility. We will review all safety related issues with the appropriate Chaparral personnel, sub-contractors and exchange phone numbers.

4.2 A tailgate safety meeting shall be held and documented each day. All sub-contractors must attend and sign the daily log-in sheet.

4.3 Anyone allowed on to location will be wearing the required standard PPE (hardhat, safety glasses, and steel toed boots).

5.0 Remediation Procedure

5.1 The deeply impacted area will be excavated to a depth of 5'bgs. The excavated material will be transported to Parabo in Eunice and a bentonite geo-synthetic liner will be placed at the bottom of the excavation. The side walls and bottom will be sampled using a 5pt. composite method and field titrated for chlorides in accordance with WEQP-97. The area above the bentonite liner will be backfilled with soils obtained from the landowner.

LAB FOR SIDEWALLS

No samples will be sent to the lab as the bentonite liner will serve as an umbrella to prevent further migration of the chlorides to groundwater. The remaining tendrils will be field tested and either sent to commercial disposal, mixed and blended with surrounding soils, or a combination of the two in order to achieve an average chloride concentration of <500 mg/L. The area will be backfilled and contoured to the surrounding area with clean backfill material bought from the land owner Mr. Grobe.

ADD CLEAN TO BRING DOWN TO 3000R250

LINER @ MAIN RELEASE & 10'X10'

6.0 Site Restoration Procedure

6.1 The site will be backfilled with clean soil backfilled, and re-contoured to match the surrounding contours area and reseeded with a seed mixture approved by the landowner.

7.0 Closure Report

At the conclusion of the project, Whole Earth shall prepare a closure report which contains the following minimum information:

- Photographs of the location prior to remediation
- Photographs of excavation at the point of maximum soil removal
- Photographs of the location at time of final closure
- Lab results
- Copies of this protocol and all testing procedures
- A copy of all material manifest sent to commercial disposal
- Photograph of the approved seed mixture bag used for seeding
- Field CL- titration results