



COUGAR OIL #11

CORRECTIVE ACTION PLAN DEVELOPMENT

ATTF CP #34



Cougar Oil #11
2800 Citizens Parkway
Selma, Dallas Co., AL
Fac ID 11262-047-010314
UST 06-02-11

PREPARED FOR

Cougar Oil Inc.
P.O. Box 1800
Selma, AL 36702

DATE

August 30, 2018

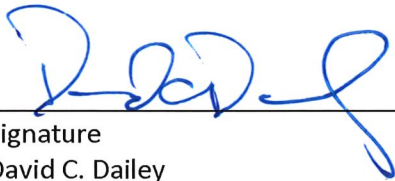
PREPARED BY

CDG Engineers & Associates, Inc.
1840 E. Three Notch St.
Andalusia, AL 36420

CERTIFICATION PAGE

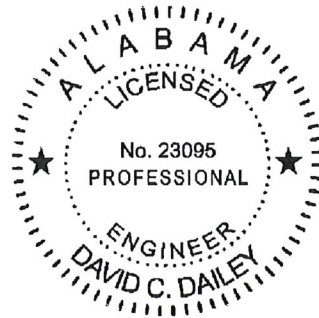
"I hereby certify that, in my professional judgment, the components of this document and associated work satisfy the applicable requirements set forth in Chapter 335-6 of the ADEM Administrative Code, and are consistent with generally accepted professional consulting principles and practices. The information submitted herein, to the best of my knowledge and belief, is true accurate, and complete. I am aware that there are significant penalties for submitting false information."

This document has been prepared based on historical site assessment data and has been prepared to address soil and groundwater contamination at the Cougar Oil #11 site (Facility Identification Number 11262-047-010314) in Selma, Dallas County, Alabama. The recommended action should not be construed to apply to any other site.



Signature
David C. Dailey
Registered Engineer in the State of Alabama
Registration No. 23095

8/28/18
Date



1.0 SITE LOCATION AND HISTORY

The Cougar Oil #11 facility is located at 2800 Citizens Parkway in Selma, Dallas County, Alabama. The Cougar Oil #11 serves as an active retail gasoline service station and convenience store. There are two underground storage tanks (USTs) located south of the building. Each UST has a 10,000-gallon capacity. The USTs are used for storing various grades of gasoline. The approximate geographical coordinates are Latitude 32° 26' 16" North and Longitude 87° 01' 19" West. The Cougar Oil #11 is owned by Cougar Oil Inc. of Selma, Alabama.

Immediately surrounding the site are commercial and residential properties. To the north is a vacant building that was once a restraint. To the east of the Cougar #11 site is a commercial shopping center. A residential apartment complex is located to the south east, and commercial properties are located to the west. The site is bounded on the west by Citizens Parkway and Cloverdale Road on the South. Adjacent to the Citizens Parkway are commercial properties. Water is supplied to the area by the City of Selma. The water lines supplying the building are located at the western boundary of the property along Citizens Parkway (State Highway 22). The electric and telephone lines are located overhead and run north-south in front of the building. A gas line runs north-south along Citizens Parkway and west-east connecting Cougar Oil #11. All utility locations are illustrated in the Figures section (Appendix B). There are no public water supply wells located within one mile of the site, and there were no private water supply wells identified within 1,000 feet of the facility.

In order to address the onsite dissolved hydrocarbon plume, ADEM requested that a Corrective Action Evaluation be prepared for the site. The cost proposal for Corrective Action Evaluation was submitted on April 17, 2017 and approved by ADEM on May 10, 2017.

The following report summarizes the Corrective Action Plan Development, approved on April 27, 2018 under cost proposal CP-34.

2.0 SUMMARY OF PREVIOUS SITE INVESTIGATIONS

On March 8, 2006, ADEM requested a preliminary investigation from Cougar Oil Company, the ATTF owner. TTL Consultants (TTL) was contracted to assume the role of the remedial action contractor. Beginning on May 11, 2006, TTL mobilized to the site to conduct the preliminary investigation activities. Four soil borings were completed and permanent groundwater monitoring wells were constructed in each boring. Upon reviewing the preliminary investigation report, ADEM determined that an on-site secondary investigation should be performed to delineate the horizontal and vertical extent of the contaminant plume. On May 2, 2007, personnel from TTL mobilized to the site to conduct the secondary investigation activities. These activities included the installation of four additional monitoring wells, and one Type 3 monitoring well. An 8-hour Mobile Enhanced Multi Phase Extraction (MEME) event was performed on May 22, 2007.

Between November of 2007 and January of 2008, an offsite secondary investigation was performed and four additional permanent groundwater monitoring wells were constructed in each boring. An Alabama Risk-Based Corrective Action (ARBCA) evaluation was submitted on April 10, 2009. Groundwater monitoring was conducted at the site until a Corrective Action Plan (CAP) for Bioremediation was submitted to ADEM for review in July 2009. On December 15, 2009, ADEM authorized the implementation of the corrective action plan (CAP) for Bioremediation. Arkea™ injection events were performed on January 25 through January 28, 2010, February 15 through 17, 2010, March 15 through March 17, 2010, and July 6 through July 8, 2010. During each event, approximately 1,800 gallons of Arkea substrate mixed with potable water and enhanced with nutrients was injected into 25 probe-holes and five existing monitoring wells.

In March 2011 an 8-hour MEME was conducted by Brown Remediation on monitoring wells MW-2 and MW-3 after free-phase product was found in the wells.

A fifth Arkea™ injection event was performed at the site from March 29 through April 1, 2011. During this event, approximately 1,600 gallons of Arkea™ substrate mixed with potable water

and enhanced with nutrients was injected into up to 30 probe-holes around MW-1 through MW-4, MW-9, and MW-11.

In December 2011 and April 2012 additional 8-hour MEME's were conducted at the site by Brown Remediation.

On March 12, 2013, TTL submitted a Revised CAP for Chemical Oxidation and Enhanced Aerobic Biodegradation to ADEM. ADEM issued a letter authorizing implementation of the Revised CAP on June 16, 2014, however ADEM did not approved the Cost Proposals to implement the revised CAP.

TTL, Inc. was the remediation contractor from initiation of site activities until July 2015. On July 14, 2015, CDG Engineers & Associates (CDG) was contracted as the Alabama Tank Trust Fund remediation contractor for Cougar Oil #11. On July 21, 2015, ADEM requested cost proposals for continued Correction Action by RNA with Tri-Annual MEME events. CDG submitted cost proposals for RNA and MEME events on August 11, 2015 which was subsequently approved on October 16, 2015. Since then RNA and MEME events have been performed at the site. On February 2, 2017, ADEM requested a Corrective Action Plan Evaluation. The CAP Evaluation was completed in September 2017.

3.0 SUMMARY OF PREVIOUSLY CONDUCTED CORRECTIVE ACTION

Five Arkea™ injection events were performed at the site between January 2010 and April 2011. During these events, approximately 8,800 gallons of Arkea™ substrate mixed with potable water and enhanced with nutrients was injected into up to probe-holes.

To date eight MEME events have been conducted at the site since May 22, 2017. The following table summarizes the results of these events:

Date	Length of Event (hrs)	Total HC Removed (lbs)	Equivalent HC (gal)	Total PCW Liquid (gal)
05/22/07	8	28.48	4.62	450
12/15/11	8	11.10	1.80	900
04/18/12	8	11.51	1.86	1,100
12/21/15	8	18.89	3.06	300
04/06/16	8	15.41	2.50	825
08/03/16	8	17.26	2.80	875
12/14/16	8	28.72	4.65	900
04/26/17	8	45.16	7.32	700
TOTALS	64	177	29	6,050

During the period between May 2007 and April 2017, the MEME events were successful in removing approximately 177 pounds of gasoline range hydrocarbons or the equivalent of 29 gallons of gasoline during the eight 8-hour events. Approximately 2.77 pounds of gasoline range hydrocarbons per hour were removed from the site.

4.0 REMEDIAL OBJECTIVES AND EXPOSURE ASSESSMENT

4.1 General Remedial Objectives

The general objectives of the corrective action activities for the facility are as follows:

- Ensure that the health and safety of all project personnel is maintained during remediation activities.
- Prevent hydrocarbon migration to sensitive receptors.
- Remove free product from the site subsurface, if present.
- Reduce adsorbed phase petroleum hydrocarbons from soils within the vadose and saturated zone, primarily in the source area, to below approved SSTLs.
- Reduce dissolved petroleum hydrocarbons from groundwater to below approved SSTLs.
- Accomplish these objectives within the proposed period of operation.

4.2 Exposure Assessment

An exposure assessment was conducted by CDG during the ARBCA evaluation. The following receptor survey information has been drawn from the ARBCA Tier II Evaluation report:

Receptor Type	Actual Receptor	Onsite/Offsite	Pathway Status
Commercial Sites	Commercial 10 hr/day	On Site	Complete. Soil & Groundwater Vapor Inhalation. Future - Soil & Groundwater Vapor Inhalation.
	Commercial 10 hr/day	Off Site	Complete. Soil & Groundwater Vapor Inhalation. Future - Soil & Groundwater Vapor Inhalation.
Construction Sites	Construction Workers	On Site	Complete. Soil & Groundwater Vapor Inhalation. Future - Dermal Contact, Soil & Groundwater Vapor Inhalation.
	Construction Workers	Off Site	Complete. Soil & Groundwater Vapor Inhalation. Future - Soil & Groundwater Vapor Inhalation.
Residences	Resident 24 hr/day	On Site	Not Complete.
	Resident 24 hr/day	Off Site	Complete. Soil & Groundwater Vapor Inhalation, Ingestion. Future - Soil & Groundwater Vapor Inhalation, Ingestion
Utilities	Water	On Site	Not Complete. Water and sewer is supplied by municipal sources. Utilities are not impacted nor potentially impacted by this release.

In April 2009, an exposure assessment was conducted by TTL during the Alabama Risk Based Corrective Action (ARBCA) evaluation. The current land use site conceptual exposure model indicates that complete exposure pathways exist onsite for indoor and outdoor vapor inhalation from soil and groundwater for commercial and construction workers. Complete exposure pathways also exist for indoor and outdoor vapor inhalation from impacted soil and groundwater for offsite commercial workers and construction workers. Future land use of the site and the surrounding area is expected to remain the same. There are no public water supply wells located within one mile of the site. There are no known domestic water supply wells located within 1,000 feet of the site.

4.3 Specific Remedial Objectives

As part of the ARBCA Tier II evaluation process, Site Specific Target Levels (SSTLs) were calculated for the various media (soil and groundwater) at the site based upon the site exposure assessment. The SSTLs were calculated in the ARBCA evaluation conducted in November 2010 and were approved by ADEM on December 8, 2010. A summary of the approved Tier II SSTLs is presented in Appendix C.

5.0 RECENT MONITORING ACTIVITIES, RESULTS, AND COMPARISONS TO ACALS

ADEM requested the development of a CAP that would address both soil and groundwater contamination at the site. As part of the CAP development, current representative concentrations for the chemicals of concern (COC) are needed in the evaluation and design of a plan to effectively treat and reduce contaminants. The site has had multiple approved groundwater monitoring and MEME events conducted. The most recent groundwater monitoring event was completed on September 26, 2017. The following details the activities and results of the September 26, 2017 groundwater monitoring event.

5.1 Groundwater Monitoring Activities

On July 20, 2017, CDG personnel mobilized to the site to sample the existing monitoring wells. Upon arriving at the site, the technicians removed all well caps and the water levels in the wells were allowed to stabilize. Potentiometric levels were then measured with an electronic water level indicator and recorded in the site field book. After all measurements were completed, each well was properly purged. During purging, conductivity and pH were measured to ensure that each well was sufficiently purged. Approximately 26.5 gallons of purge water calculated from wells was containerized and transported to CDG's Andalusia office for subsequent disposal through the sanitary sewer system per the agreement with the City of Andalusia. Upon completion of purging, groundwater samples were then collected from each of the monitoring wells and transferred to laboratory supplied containers (40-ml VOA, pre-preserved with hydrochloric acid), placed on ice, and transported to CDG's Laboratory in Andalusia, Alabama. A trip blank accompanied the samples at all times. Samples collected from monitoring wells MW-1 through MW-13 and DW-1 were analyzed for BTEX/MTBE/Naphthalene constituents in accordance with EPA Method 8260.

5.2 Laboratory Analytical Results

Based on the most recent water level measurements, the shallow groundwater flow direction appears to be to the south with a gradient of 0.007. Historic and current water level measurements are presented in the Monitoring Point Data Summary Table (Appendix A). A potentiometric surface map and a groundwater constituent concentration and benzene contour map for the most recent groundwater monitoring event is presented in Appendix B. The BTEX/MTBE and naphthalene results from groundwater samples collected during the July 20, 2017 monitoring event indicated detectable concentrations of BTEX/MTBE and/or naphthalene constituents above Groundwater Resource Protection (GRP) in monitoring wells

MW-1, MW-2, MW-3, and MW-4. None of the groundwater concentrations in the wells sampled were above the accepted SSTLs for Indoor Inhalation.

The data for dissolved oxygen, pH, and Redox potential are presented in Appendix A. The reported concentrations above the SSTLs are as follows:

<u>Well I.D.</u>	<u>COC</u>	<u>GRP SSTL</u>	<u>Indoor Inhalation SSTL</u>	<u>Concentration</u>
MW-1	Benzene	0.298 mg/L	40.5 mg/L	5.2113 mg/L
MW-2	Benzene	0.298 mg/L	40.5 mg/L	3.4200 mg/L
MW-3	Benzene	0.298 mg/L	40.5 mg/L	0.8900 mg/L
MW-4	Benzene	0.298 mg/L	40.5 mg/L	1.7400 mg/L

5.3 Conclusions

Groundwater Contamination and Site Conditions

Based on the exposure assessment that complete exposure pathways exist for onsite and offsite commercial and construction workers, and offsite residents, current soil and groundwater concentrations were compared to the approved SSTLs determined in the ARBCA evaluation.

Groundwater samples taken in July 2017 and previous events indicate that a petroleum hydrocarbon plume most likely originated in the area around the tank pit. Based upon the July 2017 sampling event, the benzene concentrations in monitoring wells MW-1 (5.2113 mg/L), MW-2 (3.4200 mg/L), MW-3 (0.8900 mg/l), and MW-4 (1.7400 mg/L) exceeded the approved GRP SSTLs. All other BTEX constituent concentrations were below the ARBCA Tier II SSTLs generated for each of the source wells and POCs. Free product has not been detected at the site.

6.0 REMEDIATION RATIONALE AND APPROACH

Based upon current constituent concentrations and the risk assessment results, there are exceedances in the groundwater resource protection and vapor inhalation SSTLs for groundwater BTEX and MTBE constituents.

Full-scale technologies addressing both soil and groundwater were reviewed for applicability to the Cougar Oil #11 site. The discussion is divided into media (soil and groundwater) and in situ/ex situ technologies.

In order to accelerate the reduction of dissolved hydrocarbon concentrations, CDG recommends that the RNA and MEME activities be enhanced with the introduction of mobile air sparging (AS) technology. Because the COC concentrations observed do not warrant aggressive remediation of the groundwater or soil, RNA in conjunction with quarterly MEME/AS events would be an effective means of achieving the site specific cleanup goals.

Natural attenuation is the process by which dilution, volatilization, biodegradation, adsorption, and chemical reactivity are allowed to reduce contaminant concentrations to acceptable levels. As a general rule, decreasing trends indicate these natural attenuation processes are occurring and will likely continue to reduce the contaminant concentrations to below acceptable levels, when used in conjunction with MEME/AS events. If COC concentrations increase based on future monitoring results, the CAP approach should be re-evaluated.

7.0 REMEDIATION RECOMMENDATION PLAN

To address the existing levels of groundwater contamination at the site, the following approach is recommended:

A total of eight sparge points will be installed at the site. Each of the sparge points will be constructed with 1-inch diameter Schedule 40 PVC risers extending from just below the ground surface to approximately two feet above the bottom of the boring. Approximately two feet of screen (0.020-inch slotted) will be connected to the bottom of the solid riser. The risers and screen will be connected using threaded, flush-joint connections. Additionally, four existing monitoring wells (MW-1 through MW-4) will be over drilled and converted to 4-inch recovery wells, and one additional 4-inch recovery well will be installed. Each of the recovery wells will be constructed with 4-inch diameter Schedule 40 PVC risers extending from just below the ground surface to approximately two feet above the bottom of the boring. Approximately two feet of screen (0.020-inch slotted) will be connected to the bottom of the solid riser. The risers and screen will be connected using threaded, flush-joint connections. The locations of the proposed sparge points and recovery wells are illustrated on in the Figures section (Appendix B).

The total depth of the proposed sparge points is approximately 18 ft-bls. The total depths of the recovery wells will be approximately 18 ft-bls. Well-graded sand will be placed in the boring annulus for each sparge point from the bottom of the boring to at least two feet above the top of the screen. A bentonite seal approximately two feet thick will be placed at the top of each sand pack. A cement/bentonite grout will be placed above the bentonite seal to within approximately one ft-bls. The purpose of the bentonite seal and grout is to reduce the potential for air to escape up the boring and to the ground surface.

The sparge points will be set within 12-inch diameter steel manway covers surrounded by concrete pads. Construction details are shown in the Figures section (Appendix B).

Following the installation of the proposed sparge points, the corrective action approach involves allowing natural attenuation in combination with quarterly 24-hour MEME/AS events

to reduce contaminant concentrations to acceptable levels for site closure. In order to receive authorization to inject atmospheric air into the subsurface, an Underground Injection Control (UIC) Permit is required by ADEM. CDG submitted a UIC Permit application in August 2018. At the time of this CAP, the UIC Permit application is pending ADEM approval. A copy of the UIC Permit application is included in Appendix F.

Quarterly groundwater monitoring events will be conducted for up to two years to monitor the natural attenuation progress toward the remediation goals. Monitoring wells will be sampled for BTEX, MTBE, and naphthalene and for natural attenuation parameters (DO, pH, and ORP). Following four quarterly groundwater-monitoring events, CDG will recommend the site for No Further Action (NFA) status if remediation goals have been met. Should target levels continue to exceed the SSTLs in the source area after one year of monitoring and the contaminant plume maintains a stable or decreasing trend, groundwater monitoring should be continued. If COC concentrations increase based on future monitoring results, the CAP approach should be re-evaluated.

8.0 PROPOSED REPORTING REQUIREMENTS

CDG will submit reports in accordance with ADEM requirements. These reports will include the following:

Reporting of Natural Attenuation Effectiveness - CDG proposes to submit quarterly NAMR reports, which will summarize field activities and the progress of site groundwater constituent concentrations towards achieving approved corrective action levels. The following data will be included in each report: field activities performed, groundwater elevations, groundwater analytical results as compared to target levels, MEME/AS event results, potentiometric surface maps, and BTEX and MTBE constituent concentration maps. The reports will also include

remediation effectiveness and recommendations concerning additional measures deemed necessary.

Request for Closure Evaluation of Corrective Action - This report will include data that shows that remediation goals have been achieved and request a status of NFA. Methods for abandonment of monitoring and recovery wells will be described.

Site Closure Report - This report will describe in detail the closure of the site and removal of all monitoring wells.

9.0 SCHEDULE OF IMPLEMENTATION

It is anticipated that the proposed Modified CAP will begin with the first groundwater monitoring and MEME/AS event following the approval of the Modified CAP. The following schedule indicates the timetable for major project events to be completed as part of this corrective action plan:

Time Following Cap Approval (months)	Project Event	Project Event Length
0 – 24	Quarterly groundwater monitoring and MEME/AS events, evaluation of performance, and recommendations for further corrective action if required	2 Years
25	Well abandonment; completion and submittal of final report if allowable by ADEM	2 Months

10.0 PROPOSED GROUNDWATER MONITORING ACTIVITIES

Following the approval of the Modified CAP, quarterly 24-hour duration MEME/AS events will be conducted at the site in order to reduce dissolved hydrocarbon concentrations in the vicinity of the monitoring wells surrounding the tank pit. During the events, atmospheric air will be injected into each of the proposed sparge points, while groundwater and soil vapor is extracted from monitoring wells MW-1, MW-2, MW-3, MW-4, and the newly installed recovery well. The MEME/AS events will be conducted using a mobile liquid ring MPE system equipped with a mobile AS system operated by Brown Remediation, Inc. The MEME system has been approved by the ADEM for use at numerous locations in Alabama for free product recovery, emergency response, and pilot testing activities. The unit operates with continuously monitored off-gas treatment (thermal destruction).

Prior to the event, static water levels in all site wells will be recorded. Applied vacuum in the extraction well and casing vacuums in the observation wells will be recorded periodically during testing (except when the unit is not attended). Water level and vacuum measurements, to determine the radius of influence, will be obtained periodically from observation wells. Measurements of flow and hydrocarbon concentrations will also be obtained periodically during the test. Field measurements will be obtained using a calibrated Flame Ionization Detector (FID) instrument. Hydrocarbon removal rates will be calculated and plotted.

Air will be injected into the eight AS points simultaneously. The AS points will be equipped with wellhead pressure gauges, flowmeters, and control valves. An air supply system consisting of an air filter, air compressor, and pressure vessel. The air compressor should be capable of providing at least 20 cfm at pressures up to 10 to 15 pounds per square inch (gauge) (psig) above the calculated hydrostatic pressure.

The data from the initial MEME/AS event will be evaluated and a decision made about whether or not MEME/AS is an effective remedial option for the site. Factors that would indicate that air sparging is infeasible or less than optimal at the site include:

- If air could not be injected into the aquifer at a flowrate of 5 to 20 cfm at a pressure that does not exceed the soil overburden;
- If mass removal rates during the pilot test are very low, then there should be considerable concern about the viability of air sparging at the site. If pilot sparging wells are placed in high concentration areas, pilot test data typically represent the maximum achievable removal rate observed over the lifetime of the air sparging project;
- If all of the injected air appears to be conducted through a channel of high permeability, then air sparging either may be infeasible or site-specific system design enhancements may be necessary to avoid and/or compensate for this channeling;
- If the groundwater pressures remain elevated for more than 8 hours, it can be assumed that the injected air is trapped or limited by subsurface stratification and may not be reaching the targeted treatment zone.

Once per quarter, groundwater samples will be collected quarterly from all monitoring wells. The groundwater samples will be collected from the monitoring wells using new clean plastic bailers and transferred to 40 milliliter (mL) glass volatile organic analysis (VOA) vials preserved with hydrochloric acid (HCl) for BTEX, MTBE, and naphthalene analysis in accordance with EPA Method 8260B. During each groundwater sampling event, all monitoring wells will also be sampled for natural attenuation parameters (DO, pH, and ORP). The natural attenuation parameters will provide information concerning the recovery of the shallow aquifer down gradient of the release area.

The results of the proposed activities will be submitted to the ADEM in the form of a RNA/AS/MEME Report. The report will include conclusions regarding the effectiveness of the recovery activities performed, and recommendations for future site activities.



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APPENDICES

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TABLES

APPENDIX A

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-1		
INSTALLATION DATE:	05/11/06	WELL DEPTH (FT BTOC):	19	SCREEN INTERVAL (FT):	9-19	CASING ELEV (FT ABOVE MSL):	155.73	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

SOIL ANALYTICAL SUMMARY (mg/Kg)

SAMPLE ID	SAMPLE DATE	DEPTH (FT)	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
MW-1	05/11/06	10	0.191	0.138	0.645	0.333	1.84	2.956	-
MW-1	05/11/06	13	0.431	0.694	8.21	5.93	27.5	42.334	-
ISLs:			0.00862	0.00845	3.6	3.61	62.4	-	0.579

POTENTIOMETRIC ELEVATION SUMMARY

MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
05/12/06	12.31	143.42	-	-
05/10/07	13.44	142.29	-	-
11/28/07	16.19	139.54	-	-
01/31/08	15.86	139.87	-	-
12/19/08	14.95	140.78	-	-
04/10/09	12.31	143.42	-	-
08/18/09	11.25	144.48	-	-
01/13/10	11.38	144.35	-	-
04/16/10	11.00	144.73	-	-
05/10/10	11.35	144.38	-	-
09/10/10	13.51	142.22	-	-
01/14/11	14.85	140.88	-	-
04/25/11	12.46	143.27	-	-
05/09/11	12.55	143.18	-	-
09/01/11	14.62	141.11	-	-
01/03/12	15.58	140.15	-	-
04/30/12	13.26	142.47	-	-
09/06/12	13.90	141.83	-	-
12/17/14	15.37	140.36	-	-
05/28/15	12.42	143.31	-	-

INTRINSIC GROUNDWATER DATA SUMMARY

SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
05/12/06	-	-	-
05/10/17	-	-	-
11/28/07	1.69	6.50	97
01/31/08	NOT SAMPLED		
12/19/08	2.06	6.38	59
04/10/09	0.65	6.39	136
08/18/09	4.01	6.11	84
01/13/10	NOT SAMPLED		
04/16/10	NOT SAMPLED		
05/10/10	NOT SAMPLED		
09/10/10	1.42	6.36	43
01/14/11	1.10	6.47	-140
04/25/11	0.89	6.52	-123
05/09/11	-	-	-
09/01/11	1.15	5.87	-27
01/03/12	2.12	6.50	-111
04/30/12	0.91	6.49	-95
09/06/12	1.43	6.42	-92
12/17/14	0.63	6.39	-89
05/28/15	2.55	6.28	-68

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-1		
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SOIL ANALYTICAL SUMMARY (mg/Kg)

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MW-1	05/11/06	10	0.191	0.138	0.645	0.333	1.84	2.956	-
MW-1	05/11/06	13	0.431	0.694	8.21	5.93	27.5	42.334	-
ISLs:			0.00862	0.00845	3.6	3.61	62.4	-	0.579

POTENTIOMETRIC ELEVATION SUMMARY

MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
11/20/15	13.79	141.94	-	-
03/17/16	11.19	144.54	-	-
07/26/16	12.63	143.10	-	-
11/14/16	15.04	140.69	-	-
03/16/17	13.68	142.05	-	-
07/20/17	11.69	144.04	-	-

INTRINSIC GROUNDWATER DATA SUMMARY

SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
11/20/15	-	-	-
03/17/16	-	-	-
07/26/16	-	-	-
11/14/16	-	-	-
03/16/17	-	-	-
07/20/17	2.54	6.00	172

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								DIAMETER (IN):	2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

GROUNDWATER ANALYTICAL SUMMARY (mg/L)							
SAMPLE DATE	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
05/12/06	<0.25	0.886	8.770	1.890	8.560	20.106	-
05/03/07	0.240	0.943	5.136	0.826	3.442	10.347	-
11/28/07	0.128	0.305	2.523	0.287	1.457	4.572	-
2008	CA VIA MEME						
01/31/08	NOT SAMPLED						
12/19/08	0.190	1.144	7.166	1.062	4.458	13.830	-
04/10/09	0.104	1.259	7.147	1.146	4.820	14.372	-
08/18/09	0.130	1.745	4.887	0.7355	2.961	10.3285	-
11/2009	CA VIA ISCO WITH ENHANCED BIOREMEDIATION						
01/13/10	NOT SAMPLED						
04/16/10	NOT SAMPLED						
05/10/10	NOT SAMPLED						
09/10/10	0.110	0.6775	1.431	0.3710	1.505	3.9845	-
01/14/11	0.128	0.6495	2.808	0.7680	3.179	7.4045	-
05/09/11	0.164	1.0720	2.984	0.6850	2.819	7.5600	-
09/02/11	0.306	1.4340	1.370	0.5295	1.4185	4.7520	-
01/03/12	0.146	0.9955	3.464	0.9625	3.8060	9.2280	-
04/16/12	CA VIA COOL-OX APPLICATION						
04/30/12	0.103	0.6555	3.103	0.9095	4.1980	8.8660	-
09/06/12	0.138	1.3960	2.392	0.7920	2.5920	7.1720	-
12/17/14	0.125	1.6040	0.133	0.7715	1.4390	3.9475	-
05/28/15	0.122	1.2990	0.387	0.7600	1.7200	4.1660	-
11/20/15	0.1954	3.0285	0.3584	1.2458	1.5687	6.2014	0.3552
02/2016	CA VIA COGAC INJECTION						
03/17/16	0.2638	2.7938	0.8650	0.3244	0.8765	4.8597	0.0852
07/26/16	0.2977	3.6431	0.1035	0.6013	0.3569	4.7048	0.0956
11/14/16	0.1767	2.4692	0.0903	0.5475	0.2850	3.3920	0.0654
03/16/17	0.2136	2.9556	0.1533	0.5659	0.4710	4.1458	0.0761
07/20/17	0.3015	5.2113	0.5673	1.1131	0.8075	7.6992	0.2485
GRP SSTLS:	1.19	0.298	59.5	41.7	175	-	-
Inhalation SSTLS:	48000	40.5	526	169	175	-	-

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-2		
INSTALLATION DATE:	05/11/06	WELL DEPTH (FT BTOC):	19	SCREEN INTERVAL (FT):	9-19	CASING ELEV (FT ABOVE MSL):	154.50	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

SOIL ANALYTICAL SUMMARY (mg/Kg)

SAMPLE ID	SAMPLE DATE	DEPTH (FT)	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
MW-2	05/11/06	11	0.300	0.290	3.41	2.12	12.1	17.92	-
MW-2	05/11/06	14	0.037	0.021	0.010	0.009	0.008	0.048	-
ISLs:			0.00862	0.00845	3.6	3.61	62.4	-	0.579

POTENTIOMETRIC ELEVATION SUMMARY

MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
05/12/06	11.42	143.08	-	-
05/10/07	12.51	141.99	-	-
11/28/07	15.42	139.21	0.18	-
01/31/08	15.05	139.45	-	-
12/19/08	14.15	140.35	-	-
04/10/09	11.41	143.09	-	-
08/18/09	12.31	142.19	-	-
01/13/10	10.41	144.09	-	-
04/16/10	9.40	145.10	-	-
05/10/10	10.48	144.02	-	-
09/10/10	12.65	141.89	0.06	-
01/14/11	13.95	140.55	-	-
04/25/11	11.55	142.95	-	-
05/09/11	11.61	142.89	-	-
09/01/11	13.71	140.79	-	-
01/03/12	14.76	139.74	-	-
04/30/12	12.37	142.13	-	-
09/06/12	13.00	141.50	-	-
12/17/14	16.05	140.02	2.10	-
05/28/15	11.56	142.98	0.06	-

INTRINSIC GROUNDWATER DATA SUMMARY

SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
05/12/06	-	-	-
05/10/07	-	-	-
11/28/07	FREE PRODUCT (0.18 FT)		
01/31/08	NOT SAMPLED		
12/19/08	2.16	6.49	63
04/10/09	0.52	6.43	126
08/18/09	3.26	6.36	98
01/13/10	4.52	6.65	84
04/16/10	0.39	6.38	116
05/10/10	1.47	6.91	84
09/10/10	FREE PRODUCT (0.06 FT)		
01/14/11	0.74	6.61	-130
04/25/11	0.66	6.53	-138
05/09/11	-	-	-
09/01/11	-	-	-
01/03/12	2.09	6.67	-115
04/30/12	0.63	6.64	-115
09/06/12	1.20	6.52	-119
12/17/14	FREE PRODUCT (2.10 FT)		
05/28/15	FREE PRODUCT (0.06 FT)		

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-2		
INSTALLATION DATE:	05/11/06	WELL DEPTH (FT BTOC):	19	SCREEN INTERVAL (FT):	9-19	CASING ELEV (FT ABOVE MSL):	154.50	WELL TYPE:	II
								DIAMETER (IN):	2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

SOIL ANALYTICAL SUMMARY (mg/Kg)

SAMPLE ID	SAMPLE DATE	DEPTH (FT)	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
MW-2	05/11/06	11	0.300	0.290	3.41	2.12	12.1	17.92	-
MW-2	05/11/06	14	0.037	0.021	0.010	0.009	0.008	0.048	-
ISLs:			0.00862	0.00845	3.6	3.61	62.4	-	0.579

POTENTIOMETRIC ELEVATION SUMMARY

MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
11/20/15	12.53	141.97	-	-
03/17/16	10.28	144.22	-	-
07/26/16	12.00	142.78	0.38	-
11/14/16	14.60	140.34	0.59	-
03/16/17	12.78	141.72	-	-
07/20/17	10.77	143.73	-	-

INTRINSIC GROUNDWATER DATA SUMMARY

SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
11/20/15	-	-	-
03/17/16	-	-	-
07/26/16	FREE PRODUCT (0.38 FT)		
11/14/16	FREE PRODUCT (0.59 FT)		
03/16/17	-	-	-
07/20/17	-	-	-

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-2		
INSTALLATION DATE:	05/11/06	WELL DEPTH (FT BTOC):	19	SCREEN INTERVAL (FT):	9-19	CASING ELEV (FT ABOVE MSL):	154.50	WELL TYPE:	II
								DIAMETER (IN):	2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

GROUNDWATER ANALYTICAL SUMMARY (mg/L)							
SAMPLE DATE	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
05/12/06	<0.25	2.12	21.00	2.36	11.10	36.58	-
05/03/07	1.360	2.33	24.02	2.28	10.26	38.89	-
11/28/07	NOT SAMPLED - FREE PRODUCT (0.18 FT)						
2008	CA VIA MEME						
01/31/08	NOT SAMPLED						
12/19/08	0.205	1.292	29.67	2.809	12.395	46.166	-
04/10/09	0.354	1.809	31.42	2.270	10.743	46.242	-
08/18/09	0.334	1.666	26.98	2.746	11.655	43.047	-
11/2009	CA VIA ISCO WITH ENHANCED BIOREMEDIATION						
01/13/10	0.170	1.689	28.40	2.392	10.598	43.079	-
04/16/10	0.604	1.092	18.94	1.978	8.712	30.722	-
05/10/10	0.238	1.015	23.61	2.227	9.776	36.628	-
09/10/10	0.194	0.461	19.02	1.774	7.976	29.231	-
01/14/11	0.153	1.558	18.08	1.673	7.886	29.197	-
05/09/11	0.107	2.102	21.50	1.785	8.157	33.544	-
09/02/11	0.278	2.666	23.08	2.376	9.943	38.065	-
01/03/12	0.256	1.328	17.59	2.266	9.814	30.998	-
04/16/12	CA VIA COOL-OX APPLICATION						
04/30/12	0.178	1.564	13.24	2.284	9.498	26.586	-
09/06/12	<0.16	0.980	23.90	2.338	9.802	37.020	-
12/17/14	NOT SAMPLED - FREE PRODUCT (2.10 FT)						
05/28/15	NOT SAMPLED - FREE PRODUCT (0.06 FT)						
11/20/15	<0.2	5.8962	8.4699	3.1753	16.1965	33.7379	12.8846
02/2016	CA VIA COGAC INJECTION						
03/17/16	0.1214	3.3576	5.2147	1.4487	10.1642	20.1852	2.8248
07/26/16	0.1789	5.2370	13.4819	4.3493	20.2134	43.2816	2.2231
11/14/16	<0.2	4.1948	13.6318	5.1857	22.9914	46.0037	3.6816
03/16/17	0.1005	3.1989	7.0089	2.4582	13.5408	26.2068	1.8255
07/20/17	0.1260	3.4200	5.1916	1.5042	9.0620	19.1778	2.0480
GRP SSTLS:	1.19	0.298	59.5	41.7	175	-	-
Inhalation SSTLS:	48000	40.5	526	169	175	-	-

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-3		
INSTALLATION DATE:	05/11/06	WELL DEPTH (FT BTOC):	19	SCREEN INTERVAL (FT):	9-19	CASING ELEV (FT ABOVE MSL):	155.44	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

SOIL ANALYTICAL SUMMARY (mg/Kg)

SAMPLE ID	SAMPLE DATE	DEPTH (FT)	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
MW-3	05/11/06	9	0.003	0.065	0.012	0.003	0.006	0.086	-
MW-3	05/11/06	12	6.08	12.2	109	48.7	200	369.9	-
ISLs:			0.00862	0.00845	3.6	3.61	62.4	-	0.579

POTENTIOMETRIC ELEVATION SUMMARY

MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
05/12/06	12.26	143.18	-	-
05/10/07	13.68	142.22	0.61	-
11/28/07	16.33	139.42	0.41	-
12/19/08	14.98	140.60	0.19	-
04/10/09	12.25	143.19	-	-
08/18/09	13.20	142.45	0.28	-
01/13/10	11.21	144.23	-	-
04/16/10	10.79	144.87	0.30	-
05/10/10	11.30	144.30	0.21	-
09/10/10	13.34	142.20	0.13	-
01/14/11	14.67	140.77	-	-
04/25/11	12.26	143.18	-	-
05/09/11	12.33	143.11	-	-
09/01/11	14.41	141.03	-	-
01/03/12	15.47	139.97	-	-
04/30/12	13.21	142.35	0.16	-
09/06/12	13.67	141.77	-	-
12/17/14	15.63	140.26	0.60	-
05/28/15	12.38	143.19	0.18	-

INTRINSIC GROUNDWATER DATA SUMMARY

SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
05/12/06	-	-	-
05/10/07	FREE PRODUCT (0.61 FT)		
11/28/07	FREE PRODUCT (0.41 FT)		
12/19/08	FREE PRODUCT (0.19 FT)		
04/10/09	0.42	6.42	100
08/18/09	FREE PRODUCT (0.28 FT)		
01/13/10	4.5	6.54	86
04/16/10	FREE PRODUCT (0.30 FT)		
05/10/10	FREE PRODUCT (0.21 FT)		
09/10/10	FREE PRODUCT (0.13 FT)		
01/14/11	0.51	6.58	-136
04/25/11	0.92	6.48	-98
05/09/11	-	-	-
09/01/11	0.71	5.85	-74
01/03/12	2.80	6.64	-95
04/30/12	FREE PRODUCT (0.16 FT)		
09/06/12	-	-	-
12/17/14	FREE PRODUCT (0.60 FT)		
05/28/15	FREE PRODUCT (0.18 FT)		

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-3		
INSTALLATION DATE:	05/11/06	WELL DEPTH (FT BTOC):	19	SCREEN INTERVAL (FT):	9-19	CASING ELEV (FT ABOVE MSL):	155.44	WELL TYPE:	II
								DIAMETER (IN):	2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

SOIL ANALYTICAL SUMMARY (mg/Kg)

SAMPLE ID	SAMPLE DATE	DEPTH (FT)	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
MW-3	05/11/06	9	0.003	0.065	0.012	0.003	0.006	0.086	-
MW-3	05/11/06	12	6.08	12.2	109	48.7	200	369.9	-
ISLs:			0.00862	0.00845	3.6	3.61	62.4	-	0.579

POTENTIOMETRIC ELEVATION SUMMARY

MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
11/20/15	13.66	141.78	-	-
03/17/16	11.10	144.34	-	-
07/26/16	12.32	143.27	0.20	-
11/14/16	14.92	140.67	0.20	-
03/16/17	13.57	141.87	-	-
07/20/17	11.50	143.94	-	-

INTRINSIC GROUNDWATER DATA SUMMARY

SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
11/20/15	-	-	-
03/17/16	-	-	-
07/26/16	FREE PRODUCT (0.20 FT)		
11/14/16	FREE PRODUCT (0.20 FT)		
03/16/17	-	-	-
07/20/17	-	-	-

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-3		
INSTALLATION DATE:	05/11/06	WELL DEPTH (FT BTOC):	19	SCREEN INTERVAL (FT):	9-19	CASING ELEV (FT ABOVE MSL):	155.44	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

GROUNDWATER ANALYTICAL SUMMARY (mg/L)							
SAMPLE DATE	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
05/12/06	0.296	3.23	11.90	1.79	7.49	24.41	-
05/03/07	NOT SAMPLED - FREE PRODUCT (0.61 FT)						
11/28/07	NOT SAMPLED - FREE PRODUCT (0.41 FT)						
2008	CA VIA MEME						
12/19/08	NOT SAMPLED - FREE PRODUCT (0.19 FT)						
04/10/09	0.363	6.204	17.98	2.165	10.227	36.576	-
08/18/09	NOT SAMPLED - FREE PRODUCT (0.28 FT)						
11/2009	CA VIA ISCO WITH ENHANCED BIOREMEDIATION						
01/13/10	0.372	6.243	17.500	2.361	10.092	36.196	-
04/16/10	NOT SAMPLED - FREE PRODUCT (0.30 FT)						
05/10/10	NOT SAMPLED - FREE PRODUCT (0.21 FT)						
09/10/10	NOT SAMPLED - FREE PRODUCT (0.13 FT)						
01/14/11	0.142	2.272	3.652	1.040	4.888	11.852	-
05/09/11	0.050	3.255	3.470	0.727	2.674	10.126	-
09/02/11	0.3265	3.258	2.024	1.182	2.761	9.225	-
01/03/12	0.1920	2.668	4.217	1.548	5.550	13.983	-
04/16/12	CA VIA COOL-OX APPLICATION						
04/30/12	NOT SAMPLED - FREE PRODUCT (0.16 FT)						
09/06/12	0.2110	2.618	2.710	1.288	3.012	9.628	-
12/17/14	NOT SAMPLED - FREE PRODUCT (0.60 FT)						
05/28/15	NOT SAMPLED - FREE PRODUCT (0.18 FT)						
11/20/15	<0.025	8.4375	8.5548	2.5199	7.5996	27.1118	1.3203
02/2016	CA VIA COGAC INJECTION						
03/17/16	<0.05	1.0146	1.4016	2.5940	7.3202	12.3304	1.6970
07/26/16	<0.05	6.4490	9.7542	5.5469	18.3494	40.0995	2.9343
11/14/16	<0.2	3.6374	2.5938	5.9453	16.3800	28.5565	3.4277
03/16/17	<0.1	2.6700	0.6390	1.6023	3.7997	8.7110	1.0621
07/20/17	<0.0250	0.8900	0.4104	1.6099	2.9805	5.8908	1.8994
GRP SSTLs:	1.19	0.298	59.5	41.7	175	-	-
Inhalation SSTLs:	48000	40.5	526	169	175	-	-

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-4		
INSTALLATION DATE:	05/11/06	WELL DEPTH (FT BTOC):	17	SCREEN INTERVAL (FT):	7-17	CASING ELEV (FT ABOVE MSL):	155.51	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

SOIL ANALYTICAL SUMMARY (mg/Kg)

SAMPLE ID	SAMPLE DATE	DEPTH (FT)	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
MW-4	05/11/06	9	0.056	0.026	0.017	0.157	0.161	0.361	-
MW-4	05/11/06	13	2.45	7.21	93.9	61.2	263	425.31	-
ISLs:			0.00862	0.00845	3.6	3.61	62.4	-	0.579

POTENTIOMETRIC ELEVATION SUMMARY

MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
05/12/16	12.01	143.50	-	-
05/10/07	13.25	142.26	-	-
11/28/07	16.03	139.52	0.06	-
01/31/08	15.66	139.86	0.01	-
12/19/08	14.74	140.77	-	-
04/10/09	12.10	143.41	-	-
08/18/09	13.00	142.51	-	-
01/13/10	11.25	144.26	-	-
04/16/10	10.67	144.84	-	-
05/10/10	11.10	144.41	-	-
09/10/10	13.20	142.31	-	-
01/14/11	14.65	140.86	-	-
04/25/11	12.15	143.36	-	-
05/09/11	12.34	143.17	-	-
09/01/11	14.40	141.11	-	-
01/03/12	15.41	140.10	-	-
04/30/12	13.10	142.45	0.05	-
09/06/12	13.60	141.92	0.02	-
12/17/14	15.54	140.37	0.54	-
05/28/15	12.15	143.38	0.03	-

INTRINSIC GROUNDWATER DATA SUMMARY

SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
05/12/16	-	-	-
05/10/07	-	-	-
11/28/07	FREE PRODUCT (0.06 FT)		
01/31/08	FREE PRODUCT (0.01 FT)		
12/19/08	2.53	6.53	63
04/10/09	0.55	6.47	104
08/18/09	2.77	6.24	94
01/13/10	2.67	6.72	96
04/16/10	0.61	6.46	137
05/10/10	1.35	7.03	86
09/10/10	1.40	6.54	42
01/14/11	0.75	6.64	-112
04/25/11	1.01	6.78	-105
05/09/11	-	-	-
09/01/11	1.06	6.00	-73
01/03/12	-	-	-
04/30/12	FREE PRODUCT (0.05 FT)		
09/06/12	FREE PRODUCT (0.02 FT)		
12/17/14	FREE PRODUCT (0.54 FT)		
05/28/15	FREE PRODUCT (0.03 FT)		

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-4		
INSTALLATION DATE:	05/11/06	WELL DEPTH (FT BTOC):	17	SCREEN INTERVAL (FT):	7-17	CASING ELEV (FT ABOVE MSL):	155.51	WELL TYPE:	II
								DIAMETER (IN):	2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

SOIL ANALYTICAL SUMMARY (mg/Kg)

SAMPLE ID	SAMPLE DATE	DEPTH (FT)	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
MW-4	05/11/06	9	0.056	0.026	0.017	0.157	0.161	0.361	-
MW-4	05/11/06	13	2.45	7.21	93.9	61.2	263	425.31	-
ISLs:			0.00862	0.00845	3.6	3.61	62.4	-	0.579

POTENTIOMETRIC ELEVATION SUMMARY

MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
11/20/15	13.50	142.01	-	-
03/17/16	11.04	144.47	-	-
07/26/16	12.32	143.19	-	-
11/14/16	14.80	140.71	-	-
03/16/17	13.54	141.97	-	-
07/20/17	11.49	144.02	-	-

INTRINSIC GROUNDWATER DATA SUMMARY

SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
11/20/15	-	-	-
03/17/16	-	-	-
07/26/16	-	-	-
11/14/16	-	-	-
03/16/17	-	-	-
07/20/17	-	-	-

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-4		
INSTALLATION DATE:	05/11/06	WELL DEPTH (FT BTOC):	17	SCREEN INTERVAL (FT):	7-17	CASING ELEV (FT ABOVE MSL):	155.51	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

GROUNDWATER ANALYTICAL SUMMARY (mg/L)							
SAMPLE DATE	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
05/12/06	0.4460	2.040	7.630	1.330	5.840	16.840	-
05/03/07	0.3315	5.087	6.682	2.004	6.632	20.405	-
11/28/07	0.4840	4.042	8.317	2.283	7.393	22.035	-
2008	CA VIA MEME						
01/31/08	NOT SAMPLED - FREE PRODUCT (0.01 FT)						
12/19/08	0.3765	2.336	4.924	1.472	9.912	18.644	-
04/10/09	0.2935	3.174	6.599	1.274	9.830	20.877	-
08/18/09	0.2000	4.894	6.912	1.088	7.458	20.352	-
11/2009	CA VIA ISCO WITH ENHANCED BIOREMEDIATION						
01/13/10	0.2665	3.704	4.762	0.999	7.0380	16.503	-
04/16/10	0.2250	0.280	0.665	0.364	1.5995	2.9085	-
05/10/10	0.0451	0.8083	0.1569	0.0656	0.0965	1.1273	-
09/10/10	0.1720	1.6960	1.6080	0.6620	2.7070	6.6730	-
01/14/11	0.0815	0.4242	0.2749	0.5294	2.2110	3.4395	-
05/09/11	0.0828	0.5284	0.8064	0.4391	1.2167	2.9906	-
09/02/11	0.0941	1.0290	1.6900	0.7207	2.1940	5.6337	-
01/03/12	0.1582	1.9140	3.6620	0.7715	4.6180	10.9655	-
04/16/12	CA VIA COOL-OX APPLICATION						
04/30/12	NOT SAMPLED - FREE PRODUCT (0.05 FT)						
09/06/12	0.1220	0.2550	6.3000	3.0760	15.0740	24.7050	-
12/17/14	NOT SAMPLED - FREE PRODUCT (0.54 FT)						
05/28/15	NOT SAMPLED - FREE PRODUCT (0.03 FT)						
11/20/15	<0.05	0.1572	0.3565	1.4232	6.4477	8.3846	0.7342
02/2016	CA VIA COGAC INJECTION						
03/17/16	0.0352	0.0802	0.0333	0.1971	0.6139	0.9245	0.5585
07/26/16	0.0537	0.3565	0.5218	1.6323	5.3191	7.8297	0.6087
11/14/16	0.0444	0.5900	0.0706	1.2939	3.2155	5.1700	0.6805
03/16/17	0.0601	0.9870	0.1580	0.7522	1.3647	3.2619	0.7892
07/20/17	0.0947	1.7400	6.2301	2.2514	8.7633	18.9848	1.0344
GRP SSTLS:	1.19	0.298	59.5	41.7	175	-	-
Inhalation SSTLS:	48000	40.5	526	169	175	-	-

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-5		
INSTALLATION DATE:	05/02/07	WELL DEPTH (FT BTOC):	19	SCREEN INTERVAL (FT):	9-19	CASING ELEV (FT ABOVE MSL):	156.57	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

SOIL ANALYTICAL SUMMARY (mg/Kg)

SAMPLE ID	SAMPLE DATE	DEPTH (FT)	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
MW-5	05/02/07	8.5	0.002	0.003	0.004	0.003	0.003	0.013	-
MW-5	05/02/07	14	0.003	0.003	0.005	0.003	0.003	0.014	-
ISLs:			0.00862	0.00845	3.6	3.61	62.4	-	0.579

POTENTIOMETRIC ELEVATION SUMMARY

MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
05/10/07	14.41	142.16	-	-
11/28/07	17.07	139.50	-	-
01/31/08	16.85	139.72	-	-
12/19/08	15.94	140.63	-	-
04/10/09	13.35	143.22	-	-
08/18/09	14.21	142.36	-	-
01/13/10	12.47	144.10	-	-
04/16/10	12.00	144.57	-	-
05/10/10	12.39	144.18	-	-
09/10/10	14.40	142.17	-	-
01/14/11	15.36	141.21	-	-
04/25/11	13.50	143.07	-	-
09/01/11	15.00	141.57	-	-
01/03/12	16.40	140.17	-	-
04/30/12	14.31	142.26	-	-
09/06/12	15.08	141.49	-	-
12/17/14	15.81	140.76	-	-
05/28/15	13.58	142.99	-	-

INTRINSIC GROUNDWATER DATA SUMMARY

SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
05/10/07	-	-	-
11/28/07	1.55	6.71	155
01/31/08	NOT SAMPLED		
12/19/08	NOT SAMPLED		
04/10/09	NOT SAMPLED		
08/18/09	3.38	6.35	168
01/13/10	NOT SAMPLED		
04/16/10	NOT SAMPLED		
05/10/10	NOT SAMPLED		
09/10/10	2.28	6.60	161
01/14/11	NOT SAMPLED		
04/25/11	NOT SAMPLED		
09/01/11	0.91	6.31	114
01/03/12	NOT SAMPLED		
04/30/12	NOT SAMPLED		
09/06/12	1.36	6.60	-71
12/17/14	0.66	6.61	-6
05/28/15	NOT SAMPLED		

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-5		
INSTALLATION DATE:	05/02/07	WELL DEPTH (FT BTOC):	19	SCREEN INTERVAL (FT):	9-19	CASING ELEV (FT ABOVE MSL):	156.57	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

SOIL ANALYTICAL SUMMARY (mg/Kg)

SAMPLE ID	SAMPLE DATE	DEPTH (FT)	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
MW-5	05/02/07	8.5	0.002	0.003	0.004	0.003	0.003	0.013	-
MW-5	05/02/07	14	0.003	0.003	0.005	0.003	0.003	0.014	-
ISLs:			0.00862	0.00845	3.6	3.61	62.4	-	0.579

POTENTIOMETRIC ELEVATION SUMMARY

MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
11/20/15	14.69	141.88	-	-
03/17/16	12.41	144.16	-	-
07/26/16	13.52	143.05	-	-
11/14/16	15.90	140.67	-	-
03/16/17	14.82	141.75	-	-
07/20/17	12.70	143.87	-	-

INTRINSIC GROUNDWATER DATA SUMMARY

SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
11/20/15	-	-	-
03/17/16	-	-	-
07/26/16	-	-	-
11/14/16	-	-	-
03/16/17	-	-	-
07/20/17	1.49	5.70	88

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-5		
INSTALLATION DATE:	05/02/07	WELL DEPTH (FT BTOC):	19	SCREEN INTERVAL (FT):	9-19	CASING ELEV (FT ABOVE MSL):	156.57	WELL TYPE:	II
								DIAMETER (IN):	2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

GROUNDWATER ANALYTICAL SUMMARY (mg/L)							
SAMPLE DATE	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
05/03/07	<0.0009	<0.0007	<0.0006	<0.0006	<0.0018	BDL	-
11/28/07	<0.0009	<0.0007	<0.0006	<0.0006	<0.0018	BDL	-
2008	CA VIA MEME						
01/31/08	NOT SAMPLED						
12/19/08	NOT SAMPLED						
04/10/09	NOT SAMPLED						
08/18/09	<0.0008	<0.0008	<0.0006	<0.0003	<0.0014	BDL	-
11/2009	CA VIA ISCO WITH ENHANCED BIOREMEDIATION						
01/13/10	NOT SAMPLED						
04/16/10	NOT SAMPLED						
05/10/10	NOT SAMPLED						
09/10/10	<0.0008	<0.0008	<0.0006	<0.0003	<0.0014	BDL	-
01/14/11	NOT SAMPLED						
05/09/11	NOT SAMPLED						
09/02/11	<0.0005	<0.0005	<0.0004	<0.0004	<0.0013	BDL	-
01/03/12	NOT SAMPLED						
04/16/12	CA VIA COOL-OX APPLICATION						
04/30/12	NOT SAMPLED						
09/06/12	<0.0008	<0.0005	<0.0004	<0.0004	<0.0013	BDL	-
12/17/14	<0.0008	<0.0005	<0.0005	<0.0004	<0.0013	BDL	-
05/28/15	NOT SAMPLED						
11/20/15	<0.001	0.0020	0.0188	0.0841	0.3707	0.4756	0.2306
02/2016	CA VIA COGAC INJECTION						
03/17/16	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
07/26/16	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
11/14/16	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
03/16/17	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
07/20/17	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
GRP SSTLs:	-	-	-	-	-	-	-
Inhalation SSTLs:	48000	40.5	526	169	175	-	-

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-6		
INSTALLATION DATE:	05/02/07	WELL DEPTH (FT BTOC):	18.5	SCREEN INTERVAL (FT):	8.5-18.5	CASING ELEV (FT ABOVE MSL):	154.07	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

SOIL ANALYTICAL SUMMARY (mg/Kg)

SAMPLE ID	SAMPLE DATE	DEPTH (FT)	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
MW-6	05/02/07	9.5	0.004	0.101	0.007	1.09	0.969	2.167	-
MW-6	05/02/07	14	0.003	0.012	0.003	0.002	0.003	0.02	-
ISLs:			0.00862	0.00845	3.6	3.61	62.4	-	0.579

POTENTIOMETRIC ELEVATION SUMMARY

MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
05/10/07	12.05	142.02	-	-
11/28/07	14.82	139.25	-	-
01/31/08	14.44	139.63	-	-
12/19/08	13.55	140.52	-	-
04/10/09	10.87	143.20	-	-
08/18/09	11.87	142.20	-	-
01/13/10	9.91	144.16	-	-
04/16/10	9.52	144.55	-	-
05/10/10	9.80	144.27	-	-
09/10/10	12.15	141.92	-	-
01/14/11	13.45	140.62	-	-
04/25/11	11.06	143.01	-	-
09/01/11	13.27	140.80	-	-
01/03/12	14.20	139.87	-	-
04/30/12	11.81	142.26	-	-
09/06/12	12.51	141.56	-	-
12/17/14	14.00	140.07	-	-
05/28/15	11.00	143.07	-	-

INTRINSIC GROUNDWATER DATA SUMMARY

SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
05/10/07	-	-	-
11/28/07	1.23	6.53	123
01/31/08	NOT SAMPLED		
12/19/08	2.64	6.57	49
04/10/09	0.58	6.55	137
08/18/09	3.68	6.31	105
01/13/10	NOT SAMPLED		
04/16/10	NOT SAMPLED		
05/10/10	NOT SAMPLED		
09/10/10	1.94	6.50	67
01/14/11	NOT SAMPLED		
04/25/11	NOT SAMPLED		
09/01/11	0.79	5.99	11
01/03/12	NOT SAMPLED		
04/30/12	NOT SAMPLED		
09/06/12	1.14	6.57	-95
12/17/14	0.68	6.48	-67
05/28/15	NOT SAMPLED		

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-6		
INSTALLATION DATE:	05/02/07	WELL DEPTH (FT BTOC):	18.5	SCREEN INTERVAL (FT):	8.5-18.5	CASING ELEV (FT ABOVE MSL):	154.07	WELL TYPE:	II
								DIAMETER (IN):	2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

SOIL ANALYTICAL SUMMARY (mg/Kg)

SAMPLE ID	SAMPLE DATE	DEPTH (FT)	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
MW-6	05/02/07	9.5	0.004	0.101	0.007	1.09	0.969	2.167	-
MW-6	05/02/07	14	0.003	0.012	0.003	0.002	0.003	0.02	-
ISLs:			0.00862	0.00845	3.6	3.61	62.4	-	0.579

POTENTIOMETRIC ELEVATION SUMMARY

MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
11/20/15	12.40	141.67	-	-
03/17/16	9.73	144.34	-	-
07/26/16	11.29	142.78	-	-
11/14/16	13.67	140.40	-	-
03/16/17	12.22	141.85	-	-
07/20/17	10.27	143.80	-	-

INTRINSIC GROUNDWATER DATA SUMMARY

SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
11/20/15	-	-	-
03/17/16	-	-	-
07/26/16	-	-	-
11/14/16	-	-	-
03/16/17	-	-	-
07/20/17	2.61	5.90	153

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-6		
INSTALLATION DATE:	05/02/07	WELL DEPTH (FT BTOC):	18.5	SCREEN INTERVAL (FT):	8.5-18.5	CASING ELEV (FT ABOVE MSL):	154.07	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

GROUNDWATER ANALYTICAL SUMMARY (mg/L)							
SAMPLE DATE	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
05/03/07	0.0071	<0.0025	0.0038	0.0295	0.1459	0.1792	-
11/28/07	0.0168	0.0342	0.1582	0.2021	0.7943	1.1888	-
2008	CA VIA MEME						
01/31/08	NOT SAMPLED						
12/19/08	<0.0045	<0.0023	0.0117	0.0960	0.2852	0.3929	-
04/10/09	<0.0021	0.0105	<0.0006	0.0041	0.0133	0.0279	-
08/18/09	<0.0019	0.0049	<0.0006	<0.0020	0.0315	0.0364	-
11/2009	CA VIA ISCO WITH ENHANCED BIOREMEDIATION						
01/13/10	NOT SAMPLED						
04/16/10	NOT SAMPLED						
05/10/10	NOT SAMPLED						
09/10/10	<0.0246	<0.0065	0.1187	0.2878	1.0307	1.4372	-
01/14/11	NOT SAMPLED						
05/09/11	NOT SAMPLED						
09/02/11	0.0360	<0.0041	0.0156	0.1539	0.5736	0.7431	-
01/03/12	NOT SAMPLED						
04/16/12	CA VIA COOL-OX APPLICATION						
04/30/12	NOT SAMPLED						
09/06/12	<0.0198	<0.0025	<0.0030	0.0416	0.1347	0.1763	-
12/17/14	0.0404	<0.0105	0.1826	0.3394	1.1459	1.6679	-
05/28/15	NOT SAMPLED						
11/20/15	0.0284	<0.005	0.0061	0.0935	0.1006	0.2002	0.0301
02/2016	CA VIA COGAC INJECTION						
03/17/16	0.0106	<0.001	<0.001	<0.001	0.0021	0.0021	<0.001
07/26/16	0.0204	<0.001	<0.001	0.0053	0.0061	0.0114	0.0027
11/14/16	0.0324	0.0198	0.0516	0.1557	0.2115	0.4386	0.0534
03/16/17	0.0302	0.0092	0.0011	0.0361	0.0049	0.0513	0.0036
07/20/17	0.0230	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
GRP SSTLs:	-	-	-	-	-	-	-
Inhalation SSTLs:	48000	40.5	526	169	175	-	-

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-7		
INSTALLATION DATE:	05/02/07	WELL DEPTH (FT BTOC):	18.2	SCREEN INTERVAL (FT):	8.2-18.2	CASING ELEV (FT ABOVE MSL):	153.50	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

SOIL ANALYTICAL SUMMARY (mg/Kg)

SAMPLE ID	SAMPLE DATE	DEPTH (FT)	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
MW-7	05/02/07	14	0.004	0.003	0.003	0.003	0.003	0.012	-
ISLs:			0.00862	0.00845	3.6	3.61	62.4	-	0.579

POTENTIOMETRIC ELEVATION SUMMARY

MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
05/10/07	11.05	142.45	-	-
11/28/07	13.68	139.82	-	-
01/31/08	13.34	140.16	-	-
12/19/08	12.45	141.05	-	-
04/10/09	9.80	143.70	-	-
08/18/09	10.77	142.73	-	-
01/13/10	8.97	144.53	-	-
04/16/10	8.53	144.97	-	-
05/10/10	8.84	144.66	-	-
09/10/10	11.10	142.40	-	-
01/14/11	12.31	141.19	-	-
04/25/11	9.96	143.54	-	-
09/01/11	12.15	141.35	-	-
01/03/12	13.05	140.45	-	-
04/30/12	11.78	141.72	-	-
09/06/12	11.37	142.13	-	-
12/17/14	12.90	140.60	-	-
05/28/15	10.50	143.00	-	-
11/20/15	11.29	142.21	-	-
03/17/16	8.72	144.78	-	-
07/26/16	10.18	143.32	-	-
11/14/16	12.52	140.98	-	-
03/16/17	11.10	142.40	-	-
07/20/17	9.19	144.31	-	-

INTRINSIC GROUNDWATER DATA SUMMARY

SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
05/10/07	-	-	-
11/28/07	2.22	6.71	393
01/31/08	NOT SAMPLED		
12/19/08	NOT SAMPLED		
04/10/09	NOT SAMPLED		
08/18/09	4.83	6.45	192
01/13/10	NOT SAMPLED		
04/16/10	NOT SAMPLED		
05/10/10	NOT SAMPLED		
09/10/10	NOT SAMPLED		
01/14/11	NOT SAMPLED		
04/25/11	NOT SAMPLED		
09/01/11	1.90	6.25	158
01/03/12	NOT SAMPLED		
04/30/12	NOT SAMPLED		
09/06/12	2.31	6.65	-18
12/17/14	1.75	6.72	47
05/28/15	NOT SAMPLED		
11/20/15	-	-	-
03/17/16	2.69	6.1	126
07/26/16	2.79	5.8	187
11/14/16	2.38	5.7	79
03/16/17	3.29	5.4	91
07/20/17	1.84	5.4	64

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-7		
INSTALLATION DATE:	05/02/07	WELL DEPTH (FT BTOC):	18.2	SCREEN INTERVAL (FT):	8.2-18.2	CASING ELEV (FT ABOVE MSL):	153.50	WELL TYPE:	II
								DIAMETER (IN):	2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

GROUNDWATER ANALYTICAL SUMMARY (mg/L)							
SAMPLE DATE	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
05/03/07	<0.0009	<0.0007	<0.0006	<0.0006	<0.0018	BDL	-
11/28/07	<0.0009	<0.0007	<0.0006	<0.0006	<0.0018	BDL	-
2008	CA VIA MEME						
01/31/08	NOT SAMPLED						
12/19/08	NOT SAMPLED						
04/10/09	NOT SAMPLED						
08/18/09	<0.0008	<0.0008	<0.0006	<0.0003	<0.0014	BDL	-
11/2009	CA VIA ISCO WITH ENHANCED BIOREMEDIATION						
01/13/10	NOT SAMPLED						
04/16/10	NOT SAMPLED						
05/10/10	NOT SAMPLED						
09/10/10	NOT SAMPLED						
01/14/11	NOT SAMPLED						
05/09/11	NOT SAMPLED						
09/02/11	<0.0008	<0.0005	<0.0004	<0.0004	<0.0013	BDL	-
01/03/12	NOT SAMPLED						
04/16/12	CA VIA COOL-OX APPLICATION						
04/30/12	NOT SAMPLED						
09/06/12	<0.0008	<0.0005	<0.0004	<0.0004	<0.0013	BDL	-
12/17/14	<0.0008	<0.0005	<0.0004	<0.0004	<0.0013	BDL	-
05/28/15	NOT SAMPLED						
11/20/15	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
02/2016	CA VIA COGAC INJECTION						
03/17/16	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
07/26/16	<0.001	<0.001	<0.001	0.0014	0.0113	0.0127	0.0410
11/14/16	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
03/16/17	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
07/20/17	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
GRP SSTLs:	-	-	-	-	-	-	-
Inhalation SSTLs:	48000	40.5	526	169	175	-	-

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-8		
INSTALLATION DATE:	05/02/07	WELL DEPTH (FT BTOC):	18.2	SCREEN INTERVAL (FT):	8.2-18.2	CASING ELEV (FT ABOVE MSL):	154.94	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

SOIL ANALYTICAL SUMMARY (mg/Kg)

SAMPLE ID	SAMPLE DATE	DEPTH (FT)	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
MW-8	05/02/07	9	0.002	0.003	0.002	0.003	0.003	0.011	-
MW-8	05/02/07	14	0.003	0.003	0.003	0.003	0.003	0.012	-
ISLs:			0.00862	0.00845	3.6	3.61	62.4	-	0.579

POTENTIOMETRIC ELEVATION SUMMARY

MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
05/10/07	11.98	142.96	-	-
11/28/07	14.65	140.29	-	-
01/31/08	14.38	140.56	-	-
12/19/08	13.38	141.56	-	-
04/10/09	10.91	144.03	-	-
08/18/09	11.71	143.23	-	-
01/13/10	9.95	144.99	-	-
04/16/10	9.43	145.51	-	-
05/10/10	9.75	145.19	-	-
09/10/10	11.95	142.99	-	-
01/14/11	13.30	141.64	-	-
04/25/11	11.00	143.94	-	-
09/01/11	13.02	141.92	-	-
01/03/12	14.00	140.94	-	-
04/30/12	11.76	143.18	-	-
09/06/12	12.20	142.74	-	-
12/17/14	13.80	141.14	-	-
05/28/15	10.86	144.08	-	-

INTRINSIC GROUNDWATER DATA SUMMARY

SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
05/10/07	-	-	-
11/28/07	1.57	6.62	343
01/31/08	NOT SAMPLED		
12/19/08	NOT SAMPLED		
04/10/09	NOT SAMPLED		
08/18/09	4.67	6.38	172
01/13/10	NOT SAMPLED		
04/16/10	NOT SAMPLED		
05/10/10	NOT SAMPLED		
09/10/10	NOT SAMPLED		
01/14/11	NOT SAMPLED		
04/25/11	NOT SAMPLED		
09/01/11	1.64	6.40	5
01/03/12	NOT SAMPLED		
04/30/12	NOT SAMPLED		
09/06/12	3.44	6.69	-44
12/17/14	0.74	6.67	28
05/28/15	NOT SAMPLED		

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-8		
INSTALLATION DATE:	05/02/07	WELL DEPTH (FT BTOC):	18.2	SCREEN INTERVAL (FT):	8.2-18.2	CASING ELEV (FT ABOVE MSL):	154.94	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

SOIL ANALYTICAL SUMMARY (mg/Kg)

SAMPLE ID	SAMPLE DATE	DEPTH (FT)	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
MW-8	05/02/07	9	0.002	0.003	0.002	0.003	0.003	0.011	-
MW-8	05/02/07	14	0.003	0.003	0.003	0.003	0.003	0.012	-
ISLs:			0.00862	0.00845	3.6	3.61	62.4	-	0.579

POTENTIOMETRIC ELEVATION SUMMARY

MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
11/20/15	12.03	142.91	-	-
03/17/16	9.74	145.20	-	-
07/26/16	10.98	143.96	-	-
11/14/16	13.46	141.48	-	-
03/16/17	12.19	142.75	-	-
07/20/17	10.20	144.74	-	-

INTRINSIC GROUNDWATER DATA SUMMARY

SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
11/20/15	-	-	-
03/17/16	2.49	5.9	151
07/26/16	2.97	6.0	159
11/14/16	2.61	5.9	55
03/16/17	2.67	5.2	74
07/20/17	2.57	5.7	136

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-8		
INSTALLATION DATE:	05/02/07	WELL DEPTH (FT BTOC):	18.2	SCREEN INTERVAL (FT):	8.2-18.2	CASING ELEV (FT ABOVE MSL):	154.94	WELL TYPE:	II
								DIAMETER (IN):	2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

GROUNDWATER ANALYTICAL SUMMARY (mg/L)							
SAMPLE DATE	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
05/03/07	<0.0009	<0.0007	<0.0006	<0.0006	<0.0018	BDL	-
11/28/07	<0.0009	<0.0007	<0.0006	<0.0006	<0.0018	BDL	-
2008	CA VIA MEME						
01/31/08	NOT SAMPLED						
12/19/08	NOT SAMPLED						
04/10/09	NOT SAMPLED						
08/18/09	<0.0008	<0.0008	<0.0006	<0.0003	<0.0014	BDL	-
11/2009	CA VIA ISCO WITH ENHANCED BIOREMEDIATION						
01/13/10	NOT SAMPLED						
04/16/10	NOT SAMPLED						
05/10/10	NOT SAMPLED						
09/10/10	NOT SAMPLED						
01/14/11	NOT SAMPLED						
05/09/11	NOT SAMPLED						
09/02/11	<0.0008	<0.0005	<0.0004	<0.0004	<0.0013	BDL	-
01/03/12	NOT SAMPLED						
04/16/12	CA VIA COOL-OX APPLICATION						
04/30/12	NOT SAMPLED						
09/06/12	<0.0008	<0.0005	<0.0004	<0.0004	<0.0013	BDL	-
12/17/14	<0.0008	<0.0005	<0.0004	<0.0004	<0.0013	BDL	-
05/28/15	NOT SAMPLED						
11/20/15	<0.001	<0.001	0.0031	0.0076	0.0346	0.0453	0.0360
02/2016	CA VIA COGAC INJECTION						
03/17/16	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
07/26/16	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	0.0030
11/14/16	<0.001	<0.001	<0.001	<0.001	0.0012	0.0012	<0.001
03/16/17	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
07/20/17	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
GRP SSTLs:	-	-	-	-	-	-	-
Inhalation SSTLs:	48000	40.5	526	169	175	-	-

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-9		
INSTALLATION DATE:	11/14/07	WELL DEPTH (FT BTOC):	18.6	SCREEN INTERVAL (FT):	8.6-18.6	CASING ELEV (FT ABOVE MSL):	155.27	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

SOIL ANALYTICAL SUMMARY (mg/Kg)

SAMPLE ID	SAMPLE DATE	DEPTH (FT)	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
MW-9	11/14/07	17.5-18.5	0.00093	0.0021	0.00068	0.00053	0.00164	0.00495	-
ISLs:			0.00862	0.00845	3.6	3.61	62.4	-	0.579

POTENTIOMETRIC ELEVATION SUMMARY

MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
11/28/07	16.37	138.90	-	-
01/31/08	16.12	139.15	-	-
12/19/08	15.05	140.22	-	-
04/10/09	13.09	142.18	-	-
08/18/09	13.33	141.94	-	-
01/13/10	12.06	143.21	-	-
04/16/10	12.23	143.04	-	-
05/10/10	12.40	142.87	-	-
09/10/10	13.90	141.37	-	-
01/14/11	15.31	139.96	-	-
04/25/11	12.82	142.45	-	-
05/09/11	12.92	142.35	-	-
09/01/11	15.10	140.17	-	-
01/03/12	15.93	139.34	-	-
04/30/12	13.70	141.57	-	-
09/06/12	14.37	140.90	-	-
12/17/14	15.81	139.46	-	-
05/28/15	13.85	141.42	-	-

INTRINSIC GROUNDWATER DATA SUMMARY

SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
11/28/07	1.58	6.98	114
01/31/08	NOT SAMPLED		
12/19/08	2.98	6.64	45
04/10/09	0.70	6.64	133
08/18/09	4.34	6.29	98
01/13/10	3.55	6.79	83
04/16/10	0.72	6.44	99
05/10/10	1.39	6.89	91
09/10/10	3.50	6.56	11
01/14/11	0.70	6.76	-126
04/25/11	1.15	6.80	-130
05/09/11	-	-	-
09/01/11	2.03	6.02	-37
01/03/12	-	-	-
04/30/12	0.70	6.69	-91
09/06/12	1.61	6.58	-94
12/17/14	1.58	6.73	-17
05/28/15	1.41	6.25	-38

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-9		
INSTALLATION DATE:	11/14/07	WELL DEPTH (FT BTOC):	18.6	SCREEN INTERVAL (FT):	8.6-18.6	CASING ELEV (FT ABOVE MSL):	155.27	WELL TYPE:	II
								DIAMETER (IN):	2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

SOIL ANALYTICAL SUMMARY (mg/Kg)

SAMPLE ID	SAMPLE DATE	DEPTH (FT)	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
MW-9	11/14/07	17.5-18.5	0.00093	0.0021	0.00068	0.00053	0.00164	0.00495	-
ISLs:			0.00862	0.00845	3.6	3.61	62.4	-	0.579

POTENTIOMETRIC ELEVATION SUMMARY

MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
11/20/15	14.21	141.06	-	-
03/17/16	11.53	143.74	-	-
07/26/16	13.00	142.27	-	-
11/14/16	15.34	139.93	-	-
03/16/17	14.09	141.18	-	-
07/20/17	12.04	143.23	-	-

INTRINSIC GROUNDWATER DATA SUMMARY

SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
11/20/15	2.80	5.2	152
03/17/16	2.81	5.6	182
07/26/16	2.63	5.7	181
11/14/16	2.82	6.0	136
03/16/17	2.31	5.9	138
07/20/17	2.42	5.9	148

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-9		
INSTALLATION DATE:	11/14/07	WELL DEPTH (FT BTOC):	18.6	SCREEN INTERVAL (FT):	8.6-18.6	CASING ELEV (FT ABOVE MSL):	155.27	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

GROUNDWATER ANALYTICAL SUMMARY (mg/L)							
SAMPLE DATE	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
11/29/07	0.2690	6.63	1.51	0.274	0.6145	9.0285	-
2008	CA VIA MEME						
1/31/2008	NOT SAMPLED						
12/19/08	0.2995	12.35	3.822	0.922	1.967	19.061	-
04/10/09	0.3010	13.78	5.054	0.848	1.847	21.529	-
08/18/09	0.250	10.01	3.903	0.734	1.274	15.921	-
11/2009	CA VIA ISCO WITH ENHANCED BIOREMEDIATION						
01/13/10	0.295	12.50	5.297	1.0250	2.1460	20.9680	-
04/16/10	0.0280	0.2318	0.025	0.0520	0.0357	0.3445	-
05/10/10	0.4132	1.4790	2.297	1.0410	3.5930	8.4100	-
09/10/10	0.0081	0.0854	0.0105	0.0169	0.0109	0.1237	-
01/14/11	0.0622	0.7036	0.0368	0.0346	0.0341	0.7750	-
05/09/11	0.0186	0.1997	0.0068	0.0091	0.0033	0.2189	-
09/02/11	0.1570	1.5950	0.3930	0.1190	0.1689	2.2759	-
01/03/12	0.0382	0.0048	<0.0020	0.0249	<0.0065	0.0297	-
04/16/12	CA VIA COOL-OX APPLICATION						
04/30/12	0.1166	0.4352	0.0031	0.0407	0.0577	0.5367	-
09/06/12	0.1166	0.5132	0.0024	0.0374	0.0434	0.5964	-
12/17/14	0.1656	0.2918	<0.0025	0.0318	0.0062	0.3298	-
05/28/15	0.0532	0.9520	0.0077	0.0695	0.0212	1.0504	-
11/20/15	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
02/2016	CA VIA COGAC INJECTION						
03/17/16	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
07/26/16	0.0126	0.0054	<0.001	<0.001	<0.001	0.0054	0.0012
11/14/16	0.1202	0.0018	<0.001	0.0011	0.0011	0.0040	0.0030
03/16/17	0.0021	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
07/20/17	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
GRP SSTLS:	0.426	0.106	21.3	14.9	175	-	-
Inhalation SSTLS:	17100	6.37	361	169	175	-	-

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-10		
INSTALLATION DATE:	11/14/07	WELL DEPTH (FT BTOC):	18.9	SCREEN INTERVAL (FT):	8.9-18.9	CASING ELEV (FT ABOVE MSL):	153.71	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

SOIL ANALYTICAL SUMMARY (mg/Kg)

SAMPLE ID	SAMPLE DATE	DEPTH (FT)	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
MW-10	11/14/07	15-16	0.00096	0.0015	0.0017	0.0013	0.00169	0.00619	-
ISLs:			0.00862	0.00845	3.6	3.61	62.4	-	0.579

POTENTIOMETRIC ELEVATION SUMMARY

MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
11/28/07	15.12	138.59	-	-
01/31/08	14.66	139.05	-	-
12/19/08	13.59	140.12	-	-
04/10/09	10.86	142.85	-	-
08/18/09	12.45	141.26	-	-
01/13/10	10.19	143.52	-	-
04/16/10	9.92	143.79	-	-
05/10/10	10.30	143.41	-	-
09/10/10	12.55	141.16	-	-
01/14/11	13.76	139.95	-	-
04/25/11	11.20	142.51	-	-
09/01/11	13.45	140.26	-	-
01/03/12	14.30	139.41	-	-
04/30/12	12.61	141.10	-	-
09/06/12	13.08	140.63	-	-
12/17/14	14.36	139.35	-	-
05/28/15	11.45	142.26	-	-
11/20/15	12.69	141.02	-	-
03/17/16	9.96	143.75	-	-
07/26/16	11.67	142.04	-	-
11/14/16	14.00	139.71	-	-
03/16/17	12.44	141.27	-	-
07/20/17	10.49	143.22	-	-

INTRINSIC GROUNDWATER DATA SUMMARY

SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
11/28/07	1.60	6.89	128
01/31/08	NOT SAMPLED		
12/19/08	NOT SAMPLED		
04/10/09	NOT SAMPLED		
08/18/09	5.07	6.40	189
01/13/10	2.75	6.95	208
04/16/10	1.51	6.48	211
05/10/10	2.44	7.31	123
09/10/10	2.10	6.80	146
01/14/11	1.15	6.73	-32
04/25/11	NOT SAMPLED		
09/01/11	0.79	6.07	174
01/03/12	2.58	6.77	157
04/30/12	0.79	6.66	29
09/06/12	1.52	6.75	-34
12/17/14	1.59	6.74	88
05/28/15	NOT SAMPLED		
11/20/15	2.90	5.3	127
03/17/16	3.14	6.0	176
07/26/16	2.49	5.9	169
11/14/16	2.27	5.6	39
03/16/17	2.54	5.6	57
07/20/17	2.79	5.8	151

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-10		
INSTALLATION DATE:	11/14/07	WELL DEPTH (FT BTOC):	18.9	SCREEN INTERVAL (FT):	8.9-18.9	CASING ELEV (FT ABOVE MSL):	153.71	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

GROUNDWATER ANALYTICAL SUMMARY (mg/L)							
SAMPLE DATE	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
11/29/07	<0.0010	<0.0007	<0.0006	<0.0006	<0.0018	BDL	-
2008	CA VIA MEME						
01/31/08	NOT SAMPLED						
12/19/08	NOT SAMPLED						
04/10/09	NOT SAMPLED						
08/18/09	<0.0008	<0.0008	<0.0006	<0.0003	<0.0014	BDL	-
11/2009	CA VIA ISCO WITH ENHANCED BIOREMEDIATION						
01/13/10	NOT SAMPLED						
04/16/10	NOT SAMPLED						
05/10/10	NOT SAMPLED						
09/10/10	NOT SAMPLED						
01/14/11	NOT SAMPLED						
05/09/11	NOT SAMPLED						
09/02/11	<0.0011	<0.0005	<0.0004	<0.0004	<0.0013	BDL	-
01/03/12	NOT SAMPLED						
04/16/12	CA VIA COOL-OX APPLICATION						
04/30/12	NOT SAMPLED						
09/06/12	<0.0014	<0.0005	<0.0004	<0.0004	<0.0013	BDL	-
12/17/14	<0.0010	<0.0005	<0.0004	<0.0004	<0.0013	BDL	-
05/28/15	NOT SAMPLED						
11/20/15	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
02/2016	CA VIA COGAC INJECTION						
03/17/16	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
07/26/16	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
11/14/16	0.0011	<0.001	<0.001	<0.001	<0.001	BDL	0.0038
03/16/17	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
07/20/17	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
GRP SSTLS:	-	-	-	-	-	-	-
Inhalation SSTLS:	17100	6.37	361	169	175	-	-

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-11		
INSTALLATION DATE:	01/23/08	WELL DEPTH (FT BTOC):	19	SCREEN INTERVAL (FT):	9-19	CASING ELEV (FT ABOVE MSL):	155.17	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

POTENTIOMETRIC ELEVATION SUMMARY				
MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
01/31/08	16.65	138.52	-	-
12/19/08	16.02	139.15	-	-
04/10/09	15.05	140.12	-	-
08/18/09	14.70	140.47	-	-
01/13/10	12.63	142.54	-	-
04/16/10	12.55	142.62	-	-
05/10/10	12.98	142.19	-	-
09/10/10	14.95	140.22	-	-
01/14/11	16.36	138.81	-	-
04/25/11	13.77	141.40	-	-
05/09/11	13.81	141.36	-	-
09/01/11	16.17	139.00	-	-
01/03/12	17.25	137.92	-	-
04/30/12	14.35	140.82	-	-
09/06/12	15.44	139.73	-	-
12/17/14	16.81	138.36	-	-
05/28/15	13.96	141.21	-	-
11/20/15	14.90	140.27	-	-
03/17/16	12.36	142.81	-	-
07/26/16	14.08	141.09	-	-
11/14/16	16.39	138.78	-	-
03/16/17	15.00	140.17	-	-
07/20/17	13.00	142.17	-	-

INTRINSIC GROUNDWATER DATA SUMMARY			
SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
01/31/08	-	-	-
12/19/08	3.10	6.77	40
04/10/09	1.39	6.78	142
08/18/09	7.04	6.44	70
01/13/10	4.23	6.84	109
04/16/10	1.33	5.17	167
05/10/10	3.62	7.16	113
09/10/10	1.90	6.22	-9
01/14/11	0.70	6.62	-104
04/25/11	1.09	6.74	-82
05/09/11	-	-	-
09/01/11	1.28	5.82	35
01/03/12	3.49	6.82	-81
04/30/12	1.18	6.68	-87
09/06/12	2.03	6.72	-94
12/17/14	3.27	6.84	-25
05/28/15	1.22	6.28	-19
11/20/15	3.60	5.3	153
03/17/16	2.74	5.7	131
07/26/16	2.84	5.8	192
11/14/16	2.57	5.9	91
03/16/17	-	-	-
07/20/17	2.55	5.7	163

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-11		
INSTALLATION DATE:	01/23/08	WELL DEPTH (FT BTOC):	19	SCREEN INTERVAL (FT):	9-19	CASING ELEV (FT ABOVE MSL):	155.17	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

GROUNDWATER ANALYTICAL SUMMARY (mg/L)							
SAMPLE DATE	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
2008	CA VIA MEME						
02/01/08	0.4871	1.6730	0.8590	0.1198	0.3441	2.9959	-
12/19/08	0.2391	3.0900	4.2800	0.4118	1.6726	9.4544	-
04/10/09	0.3942	3.9840	2.8990	0.3115	1.1067	8.3012	-
08/18/09	0.2280	3.7520	3.3620	4.0050	1.4305	12.5495	-
11/2009	CA VIA ISCO WITH ENHANCED BIOREMEDIATION						
01/13/10	0.4175	3.7060	2.3440	0.3248	1.1365	7.5113	-
04/16/10	<0.0034	0.0057	0.0045	<0.0022	0.0080	0.0182	-
05/10/10	0.0102	0.0232	0.0058	0.0040	0.0133	0.0463	-
09/10/10	0.1908	0.6884	0.0183	0.0292	0.0772	0.8131	-
01/14/11	0.2638	1.9480	0.0279	0.1512	0.4120	2.5391	-
05/09/11	0.1323	0.8644	0.0226	0.0644	0.0989	1.0503	-
09/02/11	0.2767	1.3470	<0.0111	0.1551	0.0890	1.5911	-
01/03/12	0.2396	0.1898	<0.0036	0.0956	<0.0065	0.2854	-
04/16/12	CA VIA COOL-OX APPLICATION						
04/30/12	0.2812	0.3634	<0.0024	0.1028	<0.0046	0.4662	-
09/06/12	0.3746	1.6440	<0.0131	0.2585	0.0902	1.9927	-
12/17/14	0.2755	0.8630	<0.025	<0.150	<0.065	0.8630	-
05/28/15	<0.114	0.7690	<0.025	<0.0535	<0.065	0.7690	-
11/20/15	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
02/2016	CA VIA COGAC INJECTION						
03/17/16	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
07/26/16	0.0334	0.1620	0.0031	0.0122	0.0041	0.1814	0.0030
11/14/16	0.1928	1.0454	0.0085	0.1721	0.0107	1.2367	0.0461
03/16/17	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
07/20/17	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
GRP SSTLS:	0.162	0.0405	8.10	5.67	81	-	-
Inhalation SSTLS:	17100	6.37	361	169	175	-	-

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-12		
INSTALLATION DATE:	01/23/08	WELL DEPTH (FT BTOC):	19.3	SCREEN INTERVAL (FT):	9.3-19.3	CASING ELEV (FT ABOVE MSL):	155.44	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

POTENTIOMETRIC ELEVATION SUMMARY

MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
01/31/08	16.41	139.03	-	-
12/19/08	16.45	138.99	-	-
04/10/09	12.88	142.56	-	-
08/18/09	14.39	141.05	-	-
01/13/10	12.30	143.14	-	-
04/16/10	12.06	143.38	-	-
05/10/10	12.44	143.00	-	-
09/10/10	14.70	140.74	-	-
01/14/11	16.00	139.44	-	-
04/25/11	13.36	142.08	-	-
05/09/11	13.55	141.89	-	-
09/01/11	15.90	139.54	-	-
01/03/12	16.90	138.54	-	-
04/30/12	14.65	140.79	-	-
09/06/12	15.05	140.39	-	-
12/17/14	16.49	138.95	-	-
05/28/15	13.40	142.04	-	-
11/20/15	15.29	140.15	-	-
03/17/16	11.90	143.54	-	-
07/26/16	13.73	141.71	-	-
11/14/16	16.05	139.39	-	-
03/16/17	14.53	140.91	-	-
07/20/17	12.61	142.83	-	-

INTRINSIC GROUNDWATER DATA SUMMARY

SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
01/31/08	-	-	-
12/19/08	3.04	6.77	35
04/10/09	0.85	6.87	124
08/18/09	5.95	6.41	88
01/13/10	2.48	7.02	154
04/16/10	0.58	6.37	96
05/10/10	2.34	7.28	94
09/10/10	2.10	6.56	-19
01/14/11	0.66	6.74	-66
04/25/11	4.50	6.99	15
05/09/11	-	-	-
09/01/11	1.17	5.91	160
01/03/12	2.19	6.84	51
04/30/12	0.80	6.77	-9
09/06/12	1.99	6.75	-96
12/17/14	1.54	6.83	-76
05/28/15	5.02	6.44	3
11/20/15	3.80	5.1	136
03/17/16	2.57	5.9	124
07/26/16	2.92	6.0	169
11/14/16	2.39	5.8	57
03/16/17	-	-	-
07/20/17	2.39	5.8	144

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-12		
INSTALLATION DATE:	01/23/08	WELL DEPTH (FT BTOC):	19.3	SCREEN INTERVAL (FT):	9.3-19.3	CASING ELEV (FT ABOVE MSL):	155.44	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

GROUNDWATER ANALYTICAL SUMMARY (mg/L)							
SAMPLE DATE	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
2008	CA VIA MEME						
02/01/08	0.2864	2.2130	2.3240	0.1954	0.9514	5.6838	-
12/19/08	0.4382	2.1560	1.4930	0.2637	0.7657	4.6784	-
04/10/09	0.0248	0.2021	0.1736	0.0227	0.0715	0.4699	-
08/18/09	0.2688	0.0068	<0.0058	<0.0007	<0.0028	0.0068	-
11/2009	CA VIA ISCO WITH ENHANCED BIOREMEDIATION						
01/13/10	0.1692	1.5550	0.7628	0.1662	0.5143	2.9983	-
04/16/10	<0.0008	<0.0012	<0.0006	<0.0006	<0.0010	BDL	-
05/10/10	<0.0008	<0.0008	<0.0006	<0.0003	<0.0014	BDL	-
09/10/10	0.1644	1.3100	0.3263	<0.0191	<0.0512	1.6363	-
01/14/11	<0.0008	<0.0012	<0.0006	<0.0003	<0.0014	BDL	-
05/09/11	<0.0008	<0.0008	<0.0006	<0.0003	<0.0014	BDL	-
09/02/11	0.1471	0.9563	<0.0319	0.0929	0.1791	1.2283	-
01/03/12	<0.0019	<0.0015	<0.0004	<0.0005	<0.0013	BDL	-
04/16/12	CA VIA COOL-OX APPLICATION						
04/30/12	<0.0008	<0.0005	<0.0004	<0.0004	<0.0013	BDL	-
09/06/12	<0.0008	<0.0005	<0.0004	<0.0004	<0.0013	BDL	-
12/17/14	<0.0011	<0.0007	<0.0005	<0.0004	<0.0013	BDL	-
05/28/15	<0.0008	<0.0005	<0.0005	<0.0004	<0.0013	BDL	-
11/20/15	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
02/2016	CA VIA COGAC INJECTION						
03/17/16	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
07/26/16	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
11/14/16	0.1041	0.3550	0.0129	0.1753	0.1774	0.7206	0.0279
03/16/17	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
07/20/17	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
GRP SSTLS:	0.190	0.0475	9.51	6.65	95.1	-	-
Inhalation SSTLS:	17100	6.37	361	169	175	-	-

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-13		
INSTALLATION DATE:	07/01/08	WELL DEPTH (FT BTOC):	22.5	SCREEN INTERVAL (FT):	12.5-22.5	CASING ELEV (FT ABOVE MSL):	155.43	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

POTENTIOMETRIC ELEVATION SUMMARY

MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
07/08/08	16.91	138.52	-	-
12/19/08	19.40	136.03	-	-
04/10/09	13.72	141.71	-	-
08/18/09	15.82	139.61	-	-
01/13/10	13.25	142.18	-	-
04/16/10	13.45	141.98	-	-
05/10/10	13.90	141.53	-	-
09/10/10	16.35	139.08	-	-
01/14/11	17.45	137.98	-	-
04/25/11	11.90	143.53	-	-
09/01/11	17.51	137.92	-	-
01/03/12	18.37	137.06	-	-
04/30/12	15.61	139.82	-	-
09/06/12	16.58	138.85	-	-
12/17/14	17.96	137.47	-	-
05/28/15	14.85	140.58	-	-
11/20/15	16.31	139.12	-	-
03/17/16	12.93	142.50	-	-
07/26/16	15.34	140.09	-	-
11/14/16	17.72	137.71	-	-
03/16/17	15.61	139.82	-	-
07/20/17	13.84	141.59	-	-

INTRINSIC GROUNDWATER DATA SUMMARY

SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
07/08/08	-	-	-
12/19/08	4.36	6.65	138
04/10/09	1.12	6.77	119
08/18/09	5.65	6.33	166
01/13/10	3.46	6.88	147
04/16/10	1.52	6.66	-43
05/10/10	2.19	6.96	116
09/10/10	2.60	6.42	144
01/14/11	0.77	6.82	-32
04/25/11	2.02	6.85	113
09/01/11	1.27	5.81	198
01/03/12	2.22	6.84	-16
04/30/12	0.95	6.77	-4
09/06/12	2.98	6.77	-13
12/17/14	2.06	6.82	152
05/28/15	2.55	6.46	138
11/20/15	2.80	5.2	119
03/17/16	2.96	5.8	144
07/26/16	2.47	6.2	158
11/14/16	2.73	5.9	127
03/16/17	3.41	5.7	119
07/20/17	2.81	6.0	196

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-13		
INSTALLATION DATE:	07/01/08	WELL DEPTH (FT BTOC):	22.5	SCREEN INTERVAL (FT):	12.5-22.5	CASING ELEV (FT ABOVE MSL):	155.43	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

GROUNDWATER ANALYTICAL SUMMARY (mg/L)							
SAMPLE DATE	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
2008	CA VIA MEME						
07/09/08	0.5629	0.0201	<0.003	<0.003	<0.009	0.0201	-
12/19/08	0.3250	0.0096	<0.0008	<0.0003	<0.0014	0.0096	-
04/10/09	0.4041	0.0077	<0.0053	<0.0008	<0.0028	0.0077	-
08/18/09	0.3206	<0.0008	<0.0006	<0.0003	<0.0014	BDL	-
11/2009	CA VIA ISCO WITH ENHANCED BIOREMEDIATION						
01/13/10	NOT SAMPLED						
04/16/10	NOT SAMPLED						
05/10/10	NOT SAMPLED						
09/10/10	0.2841	<0.0008	<0.0006	<0.0003	<0.0014	BDL	-
01/14/11	0.2072	<0.0008	<0.0006	<0.0003	<0.0014	BDL	-
05/09/11	0.3306	<0.0008	<0.0006	<0.0003	<0.0014	BDL	-
09/02/11	0.2296	<0.0005	<0.0004	<0.0004	<0.0013	BDL	-
01/03/12	NOT SAMPLED						
04/16/12	CA VIA COOL-OX APPLICATION						
04/30/12	NOT SAMPLED						
09/06/12	0.3782	0.0197	<0.006	<0.0014	0.0117	0.0314	-
12/17/14	0.2824	<0.0102	<0.0005	<0.0004	<0.0013	BDL	-
05/28/15	0.2530	0.0481	<0.0007	<0.0027	<0.0013	0.0481	-
11/20/15	0.2350	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
02/2016	CA VIA COGAC INJECTION						
03/17/16	0.1572	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
07/26/16	0.0485	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
11/14/16	0.1459	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
03/16/17	0.1353	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
07/20/17	0.0793	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
GRP SSTLS:	0.0866	0.0217	4.33	3.03	43.3	-	-
Inhalation SSTLS:	17100	6.37	361	169	175	-	-

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-14		
INSTALLATION DATE:	07/01/08	WELL DEPTH (FT BTOC):	20	SCREEN INTERVAL (FT):	10-20	CASING ELEV (FT ABOVE MSL):	152.17	WELL TYPE: DIAMETER (IN):	II 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

POTENTIOMETRIC ELEVATION SUMMARY				
MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
07/08/08	14.44	137.73	-	-
12/19/08	16.00	136.17	-	-
04/10/09	11.25	140.92	-	-
08/18/09	13.91	138.26	-	-
01/13/10	10.35	141.82	-	-
04/16/10	10.98	141.19	-	-
05/10/10	11.34	140.83	-	-
09/10/10	14.60	137.57	-	-
01/14/11	15.11	137.06	-	-
04/25/11	13.50	138.67	-	-
09/01/11	15.74	136.43	-	-
01/03/12	16.08	136.09	-	-
04/30/12	13.16	139.01	-	-
09/06/12	14.64	137.53	-	-
05/28/15	12.48	139.69	-	-
11/20/15	14.00	138.17	-	-
07/26/16	13.46	138.71	-	-
11/14/16	16.04	136.13	-	-
03/16/17	Well Abandoned			

INTRINSIC GROUNDWATER DATA SUMMARY			
SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
07/08/08	-	-	-
12/19/08	2.26	6.58	138
04/10/09	0.65	6.64	143
08/18/09	5.79	6.35	195
01/13/10	2.27	6.72	187
04/16/10	1.42	6.56	-42
05/10/10	4.02	6.92	160
09/10/10	3.69	6.70	189
01/14/11	0.75	6.67	-8
04/25/11	NOT SAMPLED		
09/01/11	0.79	5.88	181
01/03/12	2.10	6.68	41
04/30/12	1.35	6.64	38
09/06/12	4.23	6.75	155
05/28/15	3.10	6.55	126
11/20/15	3.90	7.0	129
07/26/16	2.88	6.3	164
11/14/16	2.56	5.7	89
03/16/17	WELL ABANDONED		

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	MW-14		
INSTALLATION DATE:	07/01/08	WELL DEPTH (FT BTOC):	20	SCREEN INTERVAL (FT):	10-20	CASING ELEV (FT ABOVE MSL):	152.17	WELL TYPE:	II
								DIAMETER (IN):	2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

GROUNDWATER ANALYTICAL SUMMARY (mg/L)							
SAMPLE DATE	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
2008	CA VIA MEME						
07/09/08	<0.0009	<0.007	<0.0006	<0.0006	<0.0018	BDL	-
12/19/08	<0.0008	<0.0008	<0.0006	<0.0003	<0.0014	BDL	-
04/10/09	<0.0008	<0.0008	<0.0006	<0.0003	<0.0014	BDL	-
08/18/09	<0.0008	<0.0008	<0.0007	<0.0003	<0.0014	BDL	-
11/2009	CA VIA ISCO WITH ENHANCED BIOREMEDIATION						
01/13/10	NOT SAMPLED						
04/16/10	NOT SAMPLED						
05/10/10	NOT SAMPLED						
09/10/10	<0.0008	<0.0008	<0.0006	<0.0003	<0.0014	BDL	-
01/14/11	NOT SAMPLED						
05/09/11	NOT SAMPLED						
09/02/11	<0.0008	<0.0005	<0.0004	<0.0004	<0.0013	BDL	-
01/03/12	NOT SAMPLED						
04/16/12	CA VIA COOL-OX APPLICATION						
04/30/12	NOT SAMPLED						
09/06/12	<0.0008	<0.0005	<0.0004	<0.0004	<0.0013	BDL	-
12/17/14	NOT SAMPLED						
05/28/15	NOT SAMPLED						
11/20/15	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
02/2016	CA VIA COGAC INJECTION						
03/17/16	NOT SAMPLED						
07/26/16	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
11/14/16	<0.001	<0.001	<0.001	<0.001	0.0011	0.0011	<0.001
03/16/17	WELL ABANDONED						
GRP SSTLs:	-	-	-	-	-	-	-
Inhalation SSTLs:	17100	6.37	361	169	175	-	-

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	DW-1		
INSTALLATION DATE:	05/01/07	WELL DEPTH (FT BTOC):	39	SCREEN INTERVAL (FT):	34-39	CASING ELEV (FT ABOVE MSL):	154.66	WELL TYPE: DIAMETER (IN):	III 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

POTENTIOMETRIC ELEVATION SUMMARY				
MEASUREMENT DATE	DEPTH TO WATER (FT BTOC)	ELEVATION (FT ABOVE MSL)	FREE PRODUCT THICKNESS (FT)	PCW GALLONS REMOVED
05/10/07	34.75	119.91	-	-
11/28/07	36.35	118.31	-	-
01/31/08	35.80	118.86	-	-
12/19/08	35.45	119.21	-	-
04/10/09	34.10	120.56	-	-
08/18/09	34.89	119.77	-	-
01/13/10	33.85	120.81	-	-
04/16/10	33.27	121.39	-	-
05/10/10	33.45	121.21	-	-
09/10/10	34.75	119.91	-	-
01/14/11	34.77	119.89	-	-
04/25/11	33.98	120.68	-	-
09/01/11	34.80	119.86	-	-
01/03/12	35.30	119.36	-	-
04/30/12	34.34	120.32	-	-
09/06/12	35.32	119.34	-	-
12/17/14	37.06	117.60	-	-
05/28/15	34.95	119.71	-	-
11/20/15	33.64	121.02	-	-
03/17/16	33.02	121.64	-	-
07/26/16	33.97	120.69	-	-
11/14/16	34.10	120.56	-	-
03/16/17	34.00	120.66	-	-
07/20/17	33.87	120.79	-	-

INTRINSIC GROUNDWATER DATA SUMMARY			
SAMPLE DATE	DISSOLVED OXYGEN (mg/L)	pH	REDOX POTENTIAL (mV)
05/10/07	-	-	-
11/28/07	1.00	7.02	76
01/31/08	NOT SAMPLED		
12/19/08	2.64	6.83	107
04/10/09	2.15	6.81	134
08/18/09	5.55	6.59	179
01/13/10	NOT SAMPLED		
04/16/10	NOT SAMPLED		
05/10/10	NOT SAMPLED		
09/10/10	NOT SAMPLED		
01/14/11	NOT SAMPLED		
04/25/11	NOT SAMPLED		
09/01/11	1.30	6.18	157
01/03/12	NOT SAMPLED		
04/30/12	NOT SAMPLED		
09/06/12	2.20	6.96	-34
12/17/14	0.67	6.82	-70
05/28/15	NOT SAMPLED		
11/20/15	1.38	5.3	110
03/17/16	3.39	6.3	190
07/26/16	2.69	6.1	179
11/14/16	2.41	5.8	64
03/16/17	2.75	5.5	87
07/20/17	3.27	6.3	248

Monitoring Point Data Summary Table

SITE NAME:	Cougar Oil #11			UST NUMBER:	06-02-11	WELL ID:	DW-1		
INSTALLATION DATE:	05/01/07	WELL DEPTH (FT BTOC):	39	SCREEN INTERVAL (FT):	34-39	CASING ELEV (FT ABOVE MSL):	154.66	WELL TYPE: DIAMETER (IN):	III 2

Notes: BTOC (Below Top of Casing); MSL (Mean Sea Level); BDL (Below Detection Limit); CA (Corrective Action)

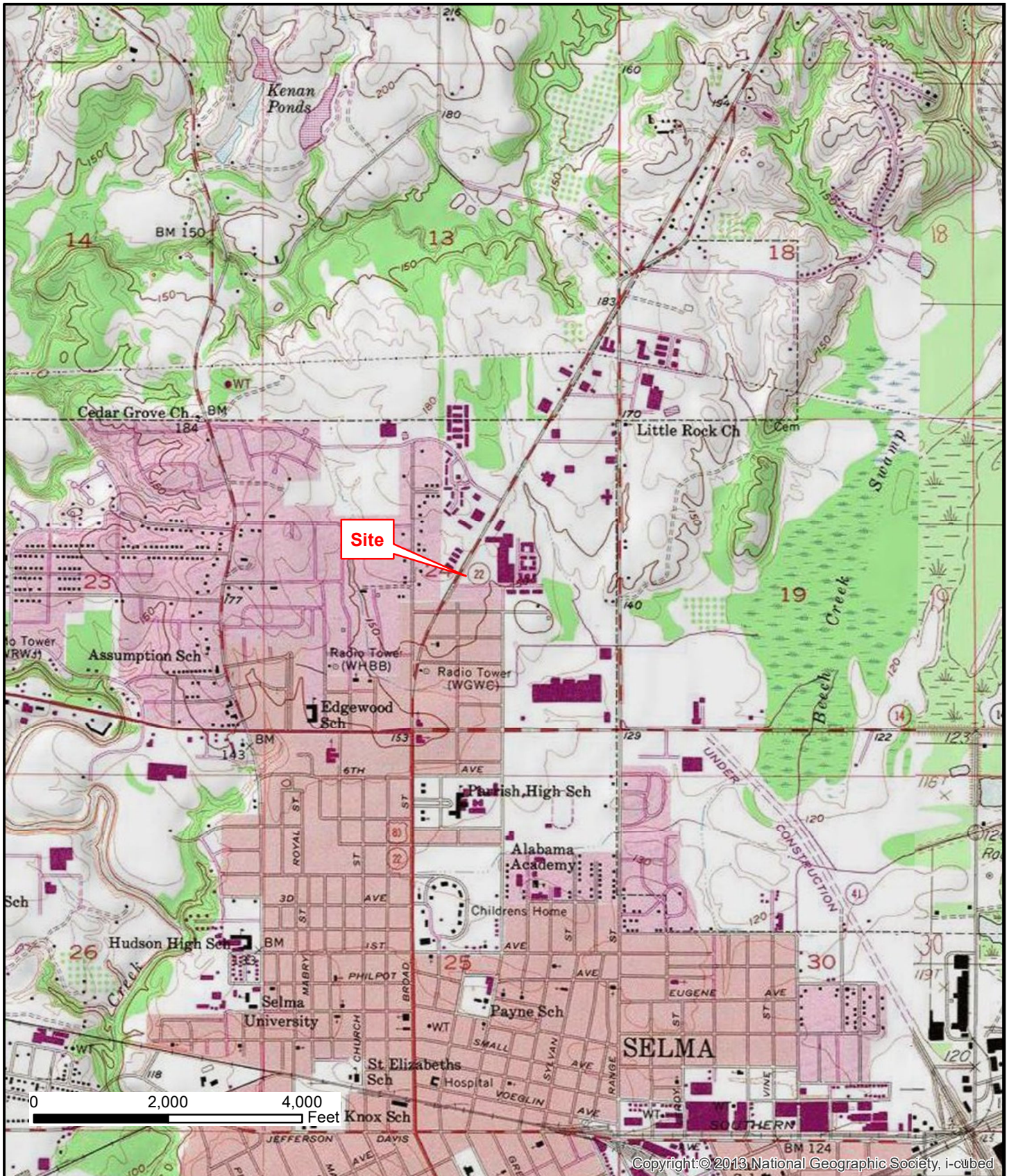
GROUNDWATER ANALYTICAL SUMMARY (mg/L)							
SAMPLE DATE	MTBE	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES	TOTAL BTEX	NAPHTHALENE
05/10/07	<0.0500	0.1649	1.1920	0.1444	0.5903	2.0916	-
11/28/07	<0.0009	<0.0013	0.0064	0.0038	0.0049	0.0151	-
2008	CA VIA MEME						
01/31/08	NOT SAMPLED						
12/19/08	<0.0008	<0.0008	<0.0008	<0.0003	<0.0014	BDL	-
04/10/09	<0.0008	<0.0008	<0.0009	<0.0003	<0.0014	BDL	-
08/18/09	<0.0008	<0.0008	<0.0006	<0.0003	<0.0014	BDL	-
11/2009	CA VIA ISCO WITH ENHANCED BIOREMEDIATION						
01/13/10	NOT SAMPLED						
04/16/10	NOT SAMPLED						
05/10/10	NOT SAMPLED						
09/10/10	NOT SAMPLED						
01/14/11	NOT SAMPLED						
05/09/11	NOT SAMPLED						
09/02/11	<0.0008	<0.0005	<0.0004	<0.0004	<0.0013	BDL	-
01/03/12	NOT SAMPLED						
04/16/12	CA VIA COOL-OX APPLICATION						
04/30/12	NOT SAMPLED						
09/06/12	<0.0008	<0.0005	<0.0007	<0.0004	<0.0013	BDL	-
12/17/14	<0.0008	<0.0005	<0.0009	<0.0004	<0.0013	BDL	-
05/28/15	NOT SAMPLED						
11/20/15	<0.001	0.0013	0.0071	0.0020	0.0076	0.0180	<0.001
02/2016	CA VIA COGAC INJECTION						
03/17/16	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
07/26/16	<0.001	<0.001	<0.001	<0.001	0.0014	0.0014	0.0039
11/14/16	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
03/16/17	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
07/20/17	<0.001	<0.001	<0.001	<0.001	<0.001	BDL	<0.001
GRP SSTLs:	-	-	-	-	-	-	-
Inhalation SSTLs:	48000	40.5	526	169	175	-	-



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FIGURES

APPENDIX B



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Site Location USGS Topographic Map

Cougar Oil #11
2800 Citizens Parkway
Selma, Dallas County, AL





Site Vicinity Map

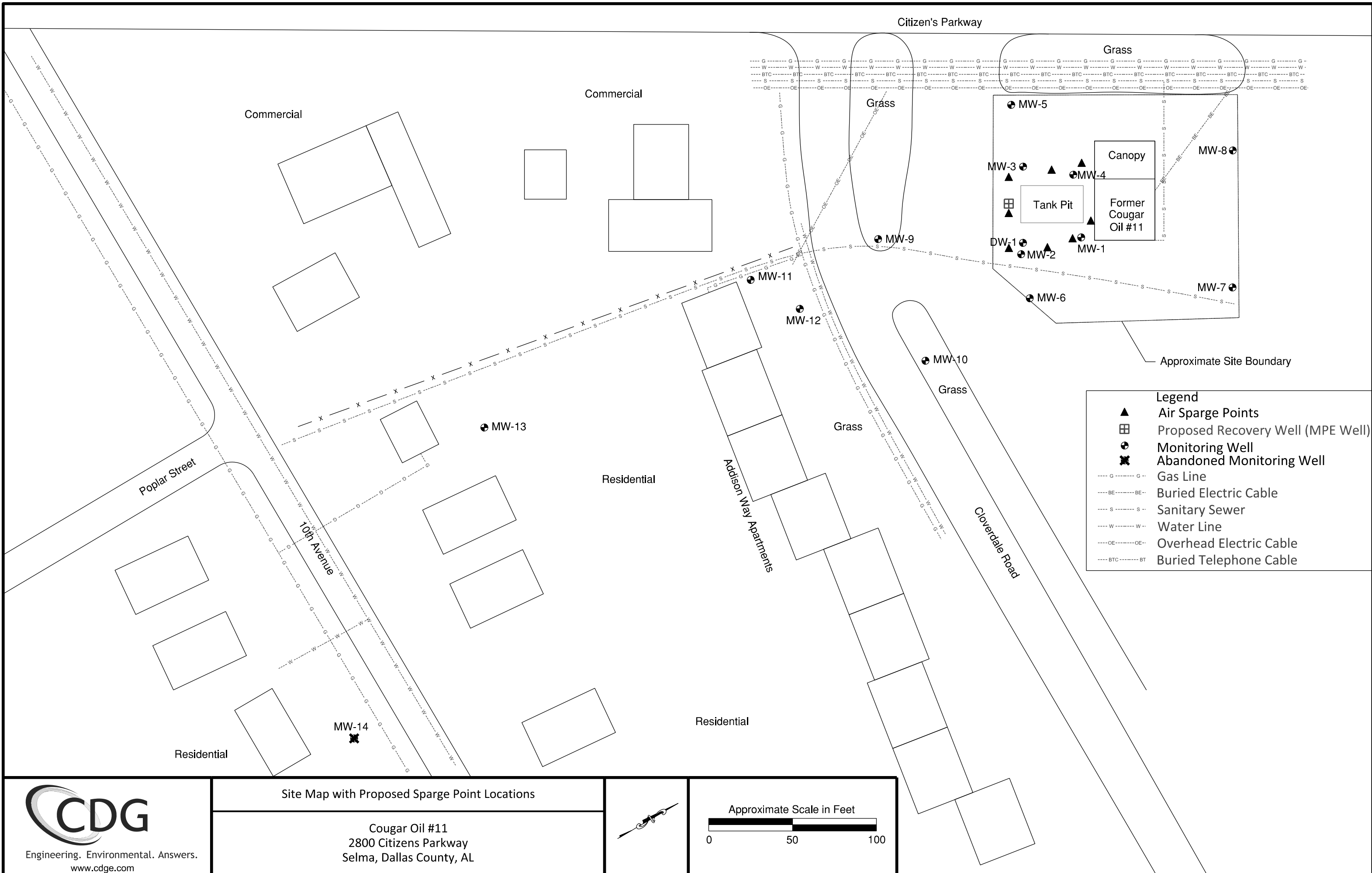
Cougar Oil #11
2800 Citizens Parkway
Selma, Dallas County, AL



Approximate Scale in Feet

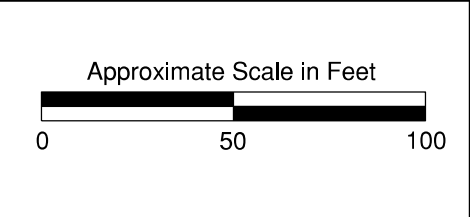
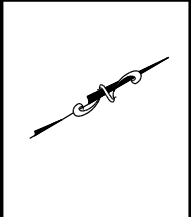


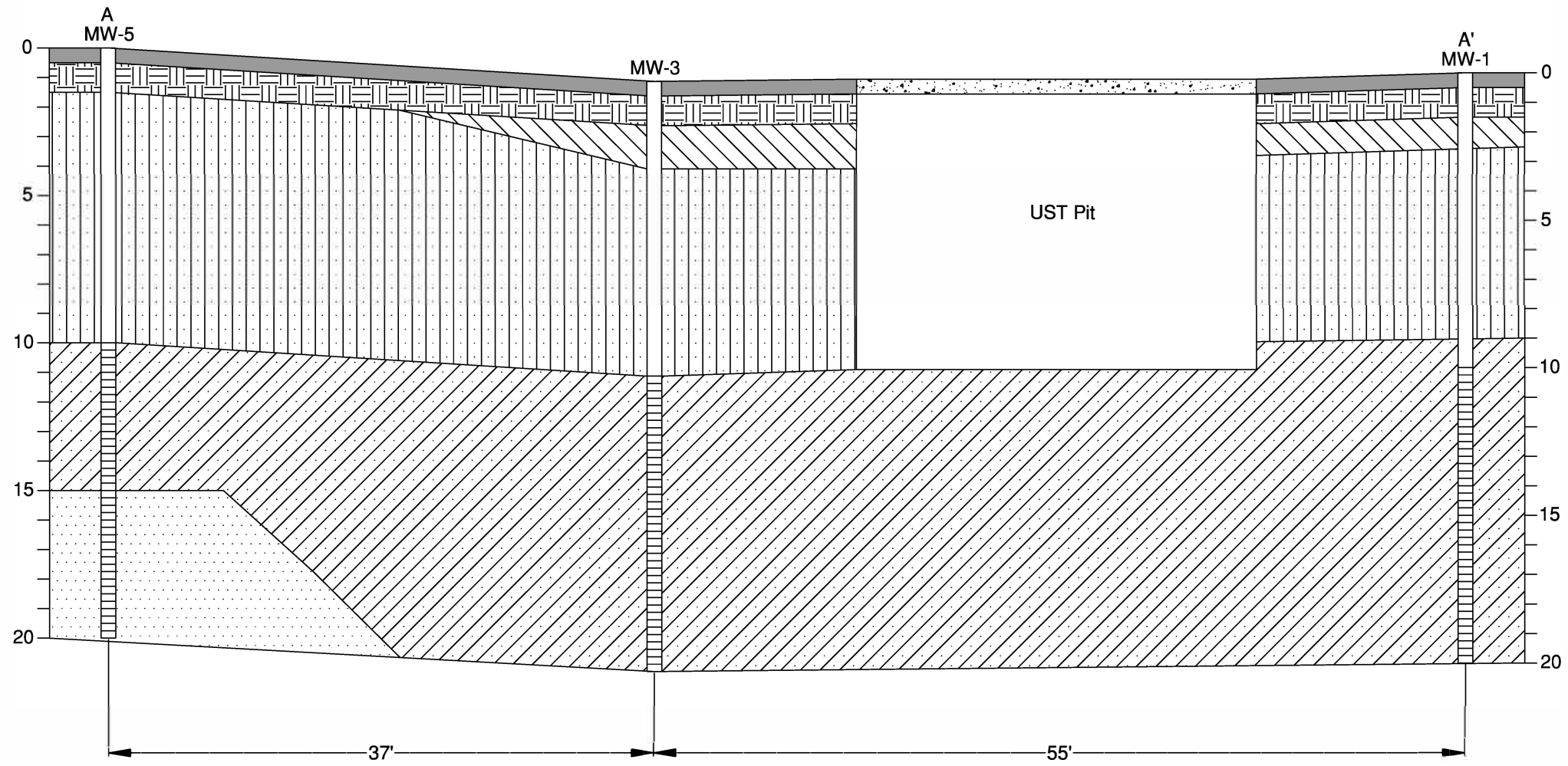
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Legend

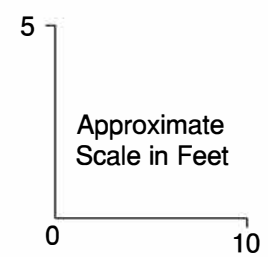
- ▲ Air Sparge Points
- ▣ Proposed Recovery Well (MPE Well)
- Monitoring Well
- ✖ Abandoned Monitoring Well
- G --- G --- Gas Line
- BE --- BE --- Buried Electric Cable
- S --- S --- Sanitary Sewer
- W --- W --- Water Line
- OE --- OE --- Overhead Electric Cable
- BTC --- BT --- Buried Telephone Cable





Legend

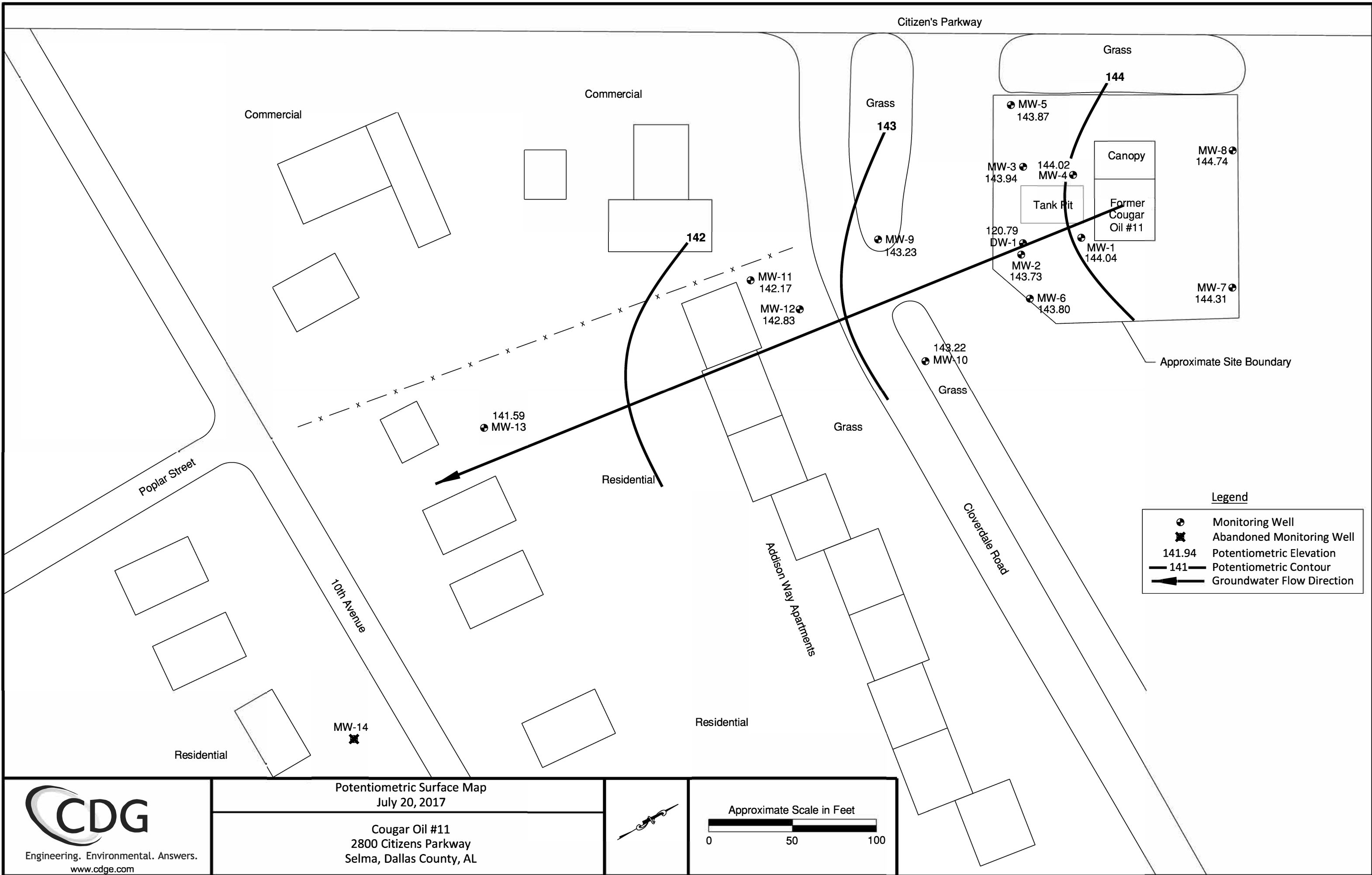
	Asphalt		Screened Interval
	Concrete		Clay
	Fill Material		Sand
	Clayey Sand		
	Silty Sand		



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Lithologic Cross-Section A-A'

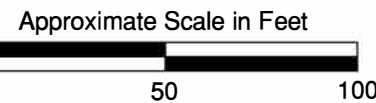
Cougar Oil #11
2800 Citizens Parkway
Selma, Dallas County, AL

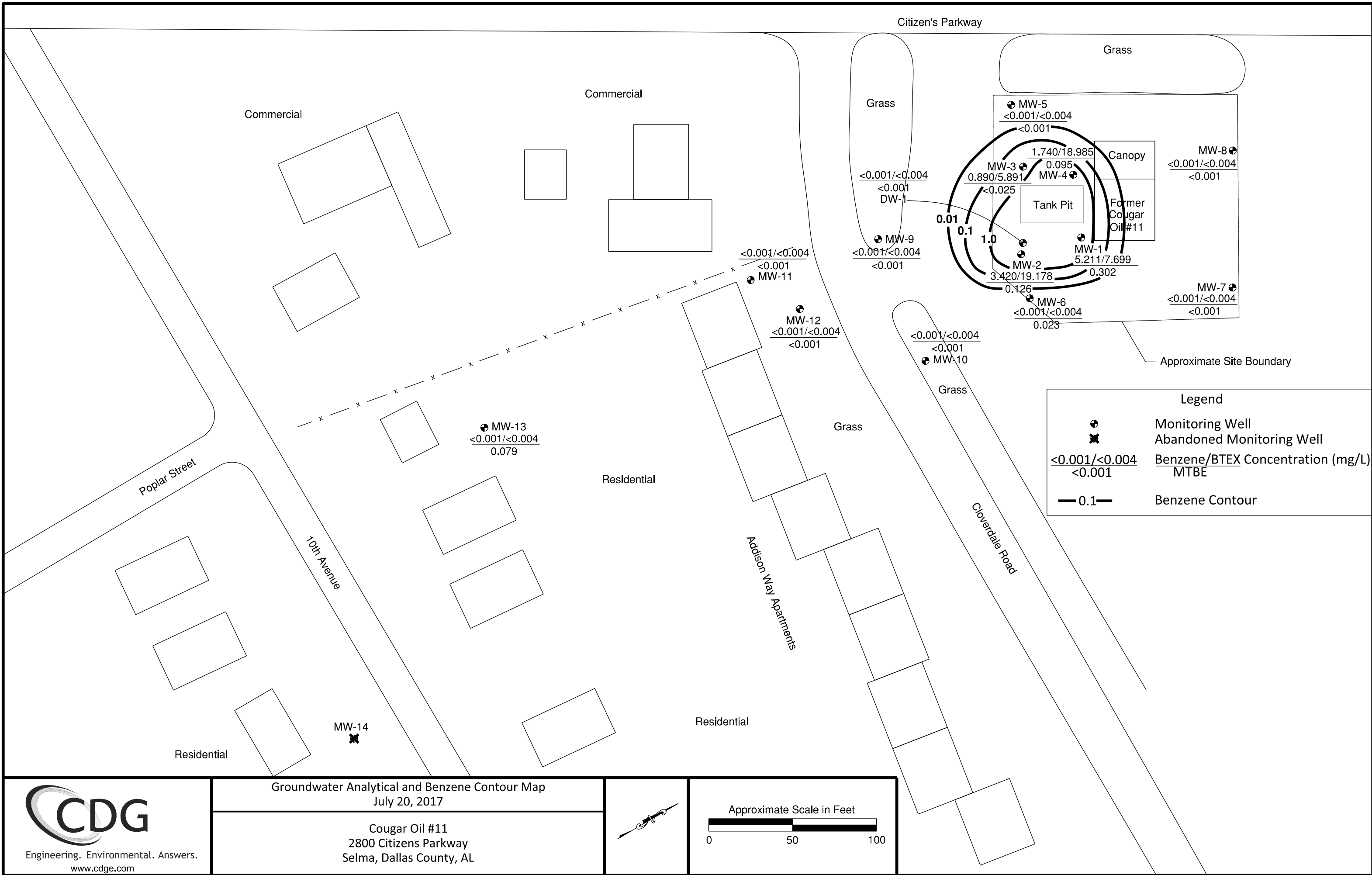


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Potentiometric Surface Map
July 20, 2017

Cougar Oil #11
2800 Citizens Parkway
Selma, Dallas County, AL





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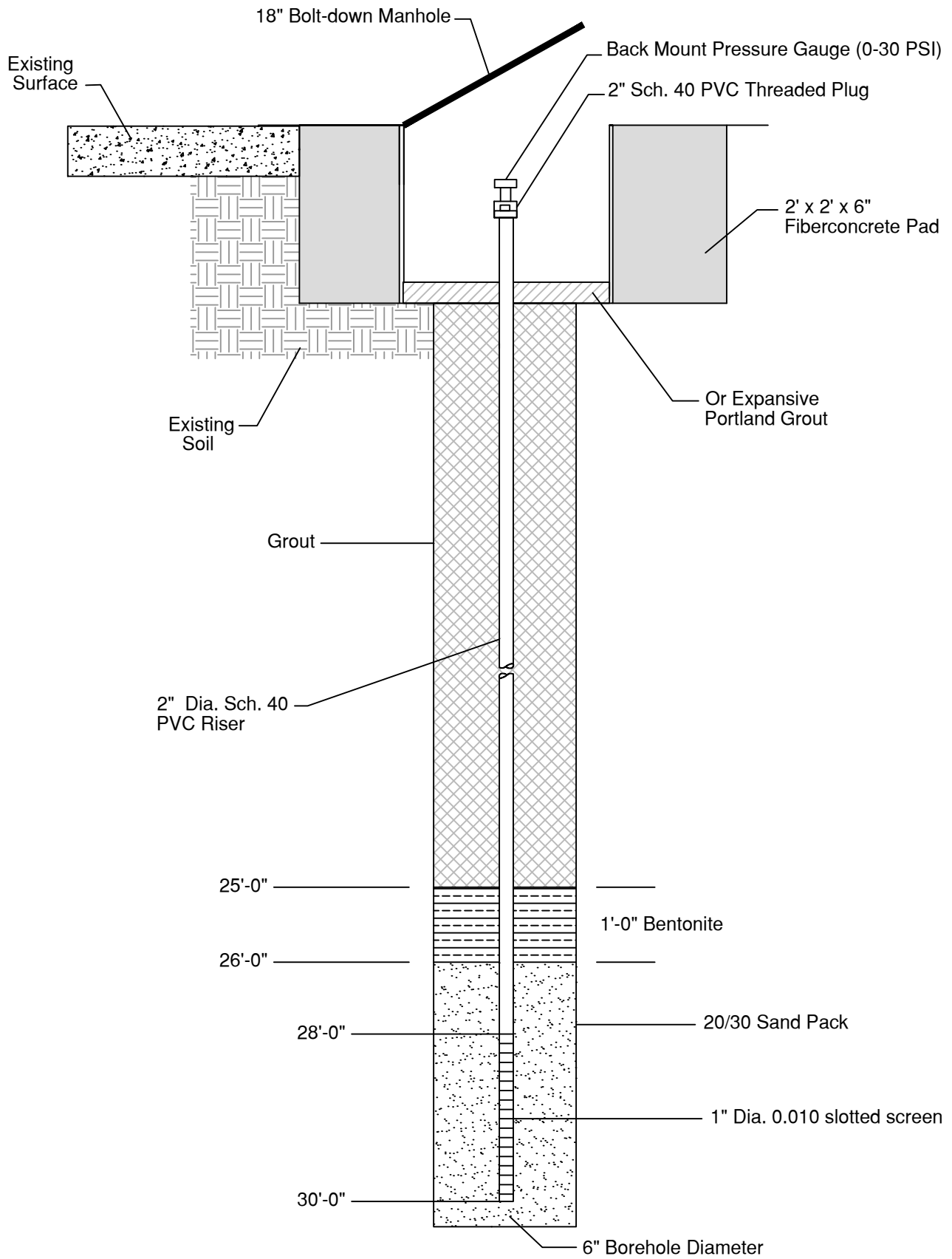
Groundwater Analytical and Benzene Contour Map
July 20, 2017

Cougar Oil #11
2800 Citizens Parkway
Selma, Dallas County, AL



Approximate Scale in Feet





Air Sparge Well Construction Detail

Cougar Oil #11
 2800 Citizens Parkway
 Selma, Dallas County, Alabama

Not to Scale



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APPROVED ARBCA SSTLs

APPENDIX C

ARBCA SUMMARY REPORT

FORM NO. 26 - ON-SITE CONSTRUCTION WORKER

UST Incident No(s): 06-02-11

Facility ID: 11262-047-010314

Date Form Completed: 10-Apr-09

Form Completed By: Shannon H. McDonald

COMPARISON OF TIER 2 SSTLs WITH REPRESENTATIVE ON-SITE CONCENTRATIONS

CHEMICALS OF CONCERN	SURFICIAL SOIL			SUBSURFACE SOIL						GROUNDWATER					
	Outdoor Inhalation, Ingestion, & Dermal Contact		NC	Indoor Inhalation		C	Outdoor Inhalation		C	Indoor Inhalation		C	Outdoor Inhalation		C
Select the representative concentration (Rep. Conc.) for each medium.	<input type="checkbox"/> Maximum			<input checked="" type="checkbox"/> Maximum			<input checked="" type="checkbox"/> Maximum			<input checked="" type="checkbox"/> Maximum			<input checked="" type="checkbox"/> Maximum		
	<input type="checkbox"/> Arithmetic Average			<input type="checkbox"/> Arithmetic Average			<input type="checkbox"/> Arithmetic Average			<input type="checkbox"/> Arithmetic Average			<input type="checkbox"/> Arithmetic Average		
	<input type="checkbox"/> Area-Weighted Average			<input type="checkbox"/> Area-Weighted Average			<input type="checkbox"/> Area-Weighted Average			<input type="checkbox"/> Area-Weighted Average			<input type="checkbox"/> Area-Weighted Average		
	Rep. Conc.*	Target Levels	E/NE	Rep. Conc.	Target Levels	E/NE	Rep. Conc.	Target Levels	E/NE	Rep. Conc.	Target Levels	E/NE	Rep. Conc.	Target Levels	E/NE
[mg/kg]	[mg/kg]		[mg/kg]	[mg/kg]		[mg/kg]	[mg/kg]		[mg/L]	[mg/L]		[mg/L]	[mg/L]		
ORGANICS															
Benzene				12.2	12.2	NE	12.2	410	NE	31.7	66.4	NE	31.7	1750	NE
Toluene				109	139	NE	109	139	NE	64.5	526	NE	64.5	526	NE
Ethylbenzene				61.2	49.1	E	61.2	49.1	E	2.81	169	NE	2.81	169	NE
Xylenes (Total)				263	53.2	E	263	53.2	E	12.4	175	NE	12.4	175	NE
MTBE				6.08	9920	NE	6.08	9920	NE	547	48000	NE	547	48000	NE
Anthracene															
Benzo(a)anthracene															
Benzo(a)pyrene															
Benzo(b)fluoranthene															
Benzo(g,h,i)perylene															
Benzo(k)fluoranthene															
Chrysene															
Fluoranthene															
Fluorene															
Naphthalene															
Phenanthrene															
Pyrene															
METALS															
Arsenic															
Barium															
Cadmium															
Chromium VI															
Lead															
Zinc															

NOTE: The Rep. Conc. and the target levels are user-inputs. Use the ARBCA Computational Software for calculating the Tier 2 SSTLs.

E: Representative concentration exceeds Tier 2 SSTLs

C: Complete Pathway

NA: Not available

NE: Representative concentration does not exceed Tier 2 SSTLs

NC: Not a Complete Pathway

* The higher of the representative concentrations for surficial and subsurface soil should be entered in the representative concentration column. The target level is the target level for surficial soil.

ARBCA SUMMARY REPORT

FORM NO. 26 - OFF-SITE RESIDENT CHILD

UST Incident No(s): 06-02-11 Facility ID: 11262-047-010314

Date Form Completed: 10-Apr-09 Form Completed By: Shannon H. McDonald

COMPARISON OF TIER 2 SSTLS WITH REPRESENTATIVE OFF-SITE CONCENTRATIONS

CHEMICALS OF CONCERN	SURFICIAL SOIL			SUBSURFACE SOIL						GROUNDWATER										
	Outdoor Inhalation, Ingestion, & Dermal Contact		NC	Indoor Inhalation		NC	Outdoor Inhalation		NC	Indoor Inhalation		C	Outdoor Inhalation		C	Ingestion of Water		NC		
	<input type="checkbox"/> Maximum <input type="checkbox"/> Arithmetic Average <input type="checkbox"/> Area-Weighted Average			<input type="checkbox"/> Maximum <input type="checkbox"/> Arithmetic Average <input type="checkbox"/> Area-Weighted Average			<input type="checkbox"/> Maximum <input type="checkbox"/> Arithmetic Average <input type="checkbox"/> Area-Weighted Average			<input checked="" type="checkbox"/> Maximum <input type="checkbox"/> Arithmetic Average <input type="checkbox"/> Area-Weighted Average			<input checked="" type="checkbox"/> Maximum <input type="checkbox"/> Arithmetic Average <input type="checkbox"/> Area-Weighted Average			Use the historic maximum concentration from the water use well as the Rep. Conc.				
Rep. Conc.	Target Levels	E/NE	Rep. Conc.	Target Levels	E/NE	Rep. Conc.	Target Levels	E/NE	Rep. Conc.	Target Levels	E/NE	Rep. Conc.	Target Levels	E/NE	Rep. Conc.	Target Levels	E/NE	Rep. Conc.	Target Levels	E/NE
[mg/kg]	[mg/kg]		[mg/kg]	[mg/kg]		[mg/kg]	[mg/kg]		[mg/L]	[mg/L]		[mg/L]	[mg/L]		[mg/L]	[mg/L]		[mg/L]	[mg/L]	
ORGANICS																				
Benzene									3.09	6.37	NE	3.09	1750	NE						
Toluene									4.28	361	NE	4.28	526	NE						
Ethylbenzene									0.4118	169	NE	0.4118	169	NE						
Xylenes (Total)									1.6726	175	NE	1.6726	175	NE						
MTBE									0.5629	17100	NE	0.5629	48000	NE						
Anthracene																				
Benzo(a)anthracene																				
Benzo(a)pyrene																				
Benzo(b)fluoranthene																				
Benzo(g,h,i)perylene																				
Benzo(k)fluoranthene																				
Chrysene																				
Fluoranthene																				
Fluorene																				
Naphthalene																				
Phenanthrene																				
Pyrene																				
METALS																				
Arsenic																				
Barium																				
Cadmium																				
Chromium VI																				
Lead																				
Zinc																				

NOTE: The Rep. Conc. and the target levels are user-inputs. Use the ARBCA Computational Software for calculating the Tier 2 SSTLS.

E: Representative concentration exceeds Tier 2 SSTLS

C: Complete Pathway

NA: Not available

NE: Representative concentration does not exceed Tier 2 SSTLS

NC: Not a Complete Pathway



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QUALITY ASSURANCE / QUALITY CONTROL PLAN

APPENDIX D

QA/QC MONITORING/SAMPLING PLAN

FIELD ACTIVITIES

Air Sampling

Air samples are collected utilizing an air sampling pump system or Summa canister. The pump is primed, prior to collection of each sample, to displace any trapped air or gases with the targeted air make-up. The air is drawn in and exits through polyethylene tubing. The sample is collected directly into and stored in a Tedlar air/gas sampling bag or Summa canister. The sample bag or canister is provided to CDG by the analytical laboratory. The air sampling pump system is also used to extract air/gases from a vacuum and drive them into a field-screening instrument. The air sample collection and screening protocols are described below.

Air Screening

Air screening is conducted to provide a field indication of the levels of hydrocarbon gases in vapor phase. The air/gases are screened with an organic vapor analyzer, equipped with a methane filter (as applicable). The field instrument is field calibrated to a gas standard of known concentration. Field air/gas samples are screened at ambient conditions and the data recorded. The field screening test form contains the following information:

- Project name (client and location);
- Data table number;
- Personnel collecting samples;
- Field screening instrument used and I.D. number;
- Calibration information;
- Description of field screening method;
- Sample identification information; and
- Screening data, including time collected/screened, ambient temperature/results.

Air Sampling Protocols

Air samples designated for laboratory analysis are collected in Tedlar bags or a Summa canister. The sample bags or canister are provided to CDG directly by the analytical laboratory. If Tedlar bags are used, two Tedlar bags are filled for each sample, in the event the bags are damaged during shipment. Upon collection, each sample bag is immediately placed in a cooler or other secure shipping container, following laboratory instructions and appropriate chain of custody documentation. The samples are sent direct to the laboratory via overnight carrier, or are picked up from the CDG office by a representative of the laboratory.

Groundwater Monitoring/Sampling Activity Protocols

Groundwater monitoring/sampling includes the following associated activities:

- 1) Measurement for the presence of free product;
- 2) Measurement of static water level;
- 3) Calculation of standing water volume (in well);
- 4) Sample collection; and
- 5) Equipment decontamination.

Groundwater sampling parameters are recorded in the field on a monitor well sampling record form. The details for each of the above referenced monitoring/sampling activities are described in the following sections.

Free Product Detection and Measurement

The presence of free product is measured prior to free product recovery, and purging/sampling the selected monitor well. Free product is detected/measured using a hydrocarbon/water interface probe. The probe is lowered slowly into the well until an instrument tone is heard (a constant tone indicates that free product is present, and an intermittent tone indicates that water is present). The point at which a constant tone is first heard is considered the top of free product. The measurement from the top of the PVC well casing to the top of free product is recorded. The measurement is checked at least twice. The probe is then slowly lowered further into the well until an intermittent tone is heard (indicating that the probe has passed through the free product layer into the underlying groundwater interval). Once the intermittent tone is encountered, the probe is slowly raised until the constant tone is again indicated. This point is considered the interface between the floating free product layer and the groundwater table. The measurement from the top of the PVC casing to the interface is recorded. This measurement is also checked at least twice.

The free product thickness is determined by calculating the difference between the measurement to the top of free product and the measurement to the free product/water interface (the interface probe measures free product and water levels to an accuracy of 0.01 feet). If free product is identified by the interface probe, a clear bailer is lowered into the well to collect a sample for visual confirmation of the free product. Remarks regarding visual characteristics of the free product are recorded (black, clear, colored, etc.).

Calculation of Standing Water Volume

The standing water volume in a monitor well is calculated using the equation:

$v = 3.14 \times r^2 \times l$ (where v = well volume, r = well radius, and l = length of the column of water in the well).

The column of water in the well can be calculated using the equation:

$I = w - d$ (where w = distance from the top of casing to the bottom of the well and d = distance from the top of casing to the top of the water).

Well Evacuation

Well evacuation is initiated after the static water level is measured and the standing water volume has been calculated. Well evacuation is conducted by either using a new disposable (single-use) bailer, a well-dedicated PVC bailer, or a surface mounted pneumatic operated diaphragm pump (a diaphragm pump is only used in deep wells (greater than 25 feet) or in wells that yield such large volumes that hand-bailing is not practical).

Well evacuation with a bailer is performed by attaching a new nylon line to the bailer, and then lowering the bailer in to the well until the bailer is submerged. The bailer is then retrieved from the well in such a manner that the bailer and nylon line do not contact the ground or surrounding vegetation (to prevent contaminating the bailer or line). The water removed from the well is poured into a graduated bucket so that the amount of water removed can be determined. This procedure is repeated until three well volumes of water are removed, or until the well is purged dry. For wells that recharge very slowly, the purge water is limited to one well volume. The volume of groundwater purged from each well will be recorded.

Well evacuation with a diaphragm pump is conducted by lowering disposable tubing (hose) into the well, to sufficient depth. For deeper wells, a PVC pipe, equipped with a foot valve (to stage-lift the water out of the well) will be employed. The piping will be well-dedicated to prevent cross-contamination. Pumping will be performed until at least three well volumes are recovered (purge volume will be recorded).

Petroleum contaminated water (PCW) purged from wells in conjunction with groundwater monitoring/sampling activities will be containerized on-site in labeled 55-gallon drums. PCW will be removed periodically from the site to an appropriate disposal/treatment/recycling facility approved by the ADEM. Records will be maintained as to the volume of PCW accumulated at the site, and identification labels will be affixed to PCW containers. Prior to disposal, samples will be collected and analyzed as required by the ADEM and the disposal/treatment/recycling facility. No waste will be removed from the site without ADEM knowledge/approval.

Groundwater Sample Collection

Groundwater samples are collected from monitor wells not containing free product, unless otherwise directed by the ADEM. Groundwater sampling is performed using a new disposable bailer for each sampled well. The disposable bailers are purchased in individually wrapped packages, and are not opened until ready to use. Once opened, the bailers are attached to a length of new nylon string. The bailer and string are not allowed to touch the ground or vegetation, and are disposed of after each well.

Sampling is accomplished by slowly lowering the bailer into the well to a depth where the bailer is almost completely submerged. The bailer is then slowly retrieved from the well to minimize agitation of the sample. Once collected, the water sample is immediately transferred (poured slowly to minimize agitation and formation of air bubbles) into the designated sample containers.

Groundwater samples collected for BTEX/MTBE and naphthalene analysis (volatile organics) are transferred very slowly down the inside of the sample vial to avoid aeration. The sample vials, consisting of 40 ml glass with a Teflon septum cap, are shipped to CDG directly from the analytical laboratory. The groundwater sample is added to the vial until a convex meniscus is formed across the top of the vial. The Teflon septum cap is placed on the vial and the vial is upended to check for trapped air bubbles. If bubbles are present, the sample container is opened, and topped off again until an air-free sample is obtained. If the vial cannot be closed "air-free" after three tries, it is discarded. Two samples are collected for each BTEX/MTBE (volatile) analysis. The preservation employed for BTEX/MTBE (volatile) analysis will include either of the following (depending on holding time constraints):

- Cool collected sample to 4°C and maintain (7 day holding time), or
- Add 4 drops concentrated HCl to sample vial (typically the acid is pre-added by the laboratory to the sample vial) and then cool sample to 4°C and maintain (14 day holding time).

Immediately following collection of each groundwater sample, the sample is labeled, placed in bubble pack (to prevent the glass vial from breaking during shipping), and stored in a well-iced ice chest. Each sample label includes the site location, sample identification number, name of collector, date/time of collection, and parameter(s) requested.

Following collection of all samples, the iced chest will be sealed and transported to the laboratory following appropriate chain of custody protocols (refer to description of Chain of Custody protocols provided below).

Decontamination of Groundwater Sampling Equipment

All equipment used for groundwater sampling is either well-dedicated or is used only once and disposed of. As a result, cleaning/decontamination of sampling equipment is minimal.

QA/QC PROCEDURES DISCUSSION

Chain of Custody

Sample custody begins with the subcontracted laboratory when sample kits are prepared and shipped for CDG use at a specified project location. Responsibility for

sample container materials and preparation lies with the subcontracted laboratory. Sample containers and kits are normally shipped to CDG by common carrier or are dropped off by a laboratory representative. Upon receipt of the kits, CDG personnel complete an inventory of the contents to confirm that the containers, etc. are adequate for the number of wells and specified analytes. Sample bottles may be pre-labeled and contain the proper preservative. The individual sample vials and/or other sample containers are not opened until used in the field. CDG will secure the sample kits inside the office until the specific sampling project is to be performed.

The samples remain in the custody of the CDG representative until delivered to the subcontract laboratory or dispatched via common carrier for shipment to the laboratory. In cases where samples leave the direct control of CDG personnel, such as shipment to a laboratory by a common carrier (FedEx, UPS, etc.), a seal will be provided on the shipping container or individual sample bottles to ensure that the samples have not been opened or otherwise disturbed during transportation.

To establish and maintain the documentation necessary to trace sample possession from the time of collection, a chain of custody record will be completed and will accompany every sample. The record contains the following types of information:

- Sample number
- Signature of collector
- Date and time of collection
- Sample type (soil, groundwater, air, etc.)
- Identification of well
- Number of containers
- Parameters requested for analysis
- Required detection limit
- Signature of person(s) involved in the chain of possession.

Field QA/QC Program

Various types of field blanks are collected to verify that the sample collection and handling process has not affected the quality or integrity of the samples.

- 1) Trip Blanks – A trip blank is a field blank that is transported from the laboratory to the sampling site, handled in the same manner as other samples, and then returned to the laboratory for analysis in determining QA/QC of sample handling procedures. The trip blank is prepared in the laboratory with distilled/organic free water and is utilized at a frequency of 1 trip blank for each cooler (or other shipping container) used to transport samples from the laboratory to the field and back to the laboratory.

- 2) Duplicate Sample – Duplicate samples are collected simultaneously from the same source, under identical conditions, into separate sample containers. These samples provide a check on the sampling techniques as well as laboratory equipment. Duplicate samples are only collected on groundwater samples at a frequency of one sample per sampling event.

The results of the analysis of the blanks will not be used to correct the groundwater data. If contaminants are found in the blanks, an attempt to identify the source of contamination will be initiated and corrective action, including re-sampling if necessary, will be evaluated.

After completing a sampling program, the field data package (field logs, calibration records, chain of custody forms, etc.) will be reviewed for completeness and accuracy. Some of the items considered in the Field Data Package Validation Procedure include but are not limited to the following:

- A completeness review of field data contained on water and soil sampling logs;
- A verification that sampler blanks were properly prepared, identified, and analyzed;
- A check on field analyses for equipment calibration and condition; and
- A review of chain of custody forms for proper completion, signatures of field personnel and the laboratory sample custodian, and dates.

Laboratory QA/QC Program

The selection of a contract laboratory can be directed either by the client or by CDG. In either case, the selection is typically based upon several facts, including cost; laboratory certification; quality data and reporting; and turn around time. The most critical factor in the selection of an analytical laboratory by CDG is the quality of data and reporting provided by the laboratory. Typically, the results of analytical laboratory testing dictate the activities conducted at a site. The activities conducted when selecting a laboratory include discussions with current and past customers, discussions with regulators, and review of laboratory QA/QC practices.

The normal turn around for samples will be two weeks for most samples. Prior to contracting a laboratory to conduct analysis, an estimate of the turn around time is obtained. If the expected turn around is in excess of three weeks then a backup laboratory is contacted to determine their availability. A decision of which laboratory to use in a particular instance is made on a case-by-case basis.

Once an analytical report is received by CDG, validation of the analytical data package will be performed. The Analytical Data Package Validation procedure will include but is not limited to the following:

- A comparison of the Data Package to the reporting level requirements designed for the project, to ensure completeness;
- A comparison of sampling dates, sample extraction dates, and analysis dates to determine if samples were extracted and/or analyzed within the proper holding times' as failure in this area may render the data unusable;
- A review of analytical methods and required detection limits to verify that they agree with set standards; as failure in this area may render the data unusable;
- A review of sample blanks to evaluate possible sources of contamination. The preparation techniques and frequencies, and the analytical results (if appropriate) will be considered; and
- A review of blanks (trip blanks, reagent blanks, method blanks, and extraction blanks) to assure that they are contamination free at the lowest possible detection limit. All blank contaminants must be explained or the data applicable to those blanks will be labeled suspect and may only be sufficient for qualitative purposes.
- A review of detection limits, to ensure sample results are accurate to below the levels specified as ADEM Initial Screening Levels.
- A review of data "qualifiers" reported by the laboratory for significance to the results.



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SITE HEALTH AND SAFETY PLAN

APPENDIX E

Site Health and Safety Plan

**Cougar Oil #11
Facility ID# 11262-047-010314
UST No. 06-02-11**

Prepared For:
**Cougar Oil
P.O. Box 1800
Selma, AL 36702**

Prepared By:
**CDG Engineers & Associates, Inc.
3 Riverchase Ridge
Hoover, Alabama 35244**

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1.0 Introduction

This Health and Safety Plan (HASP) has been prepared specifically for corrective action activities to be conducted by CDG Engineers & Associates, Inc. (CDG) for the Cougar Oil #11 facility located in Selma, Dallas County, Alabama. These activities include all fieldwork necessary to conduct soil and groundwater remediation of petroleum hydrocarbons at the site.

2.0 Purpose

This HASP describes the preventative measures, person protection, and safety procedures to be followed by CDG personnel and subcontractors during all field activities. The HASP has been prepared in accordance with and meets the requirements of the Occupation Safety and Health Administration (OSHA) General Safety Standards for industry under 29 CFR 1910 and construction under 29 CFR 1926, the joint NIOSH/OSHA/USCG/EPA, *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, dated October 1985, and NFPA Safety Guidelines. Should any unexpected conditions arise, the HASP will be amended to accommodate site specific conditions.

3.0 Key Personnel and Responsibilities

All CDG personnel have received an initial 40-hour HAZWOPER certification, which is updated annually through an 8-hour refresher course. This training course meets the requirements of the OSHA 29 CFR 1910.120 standards. CDG personnel assigned to the project include:

NAME	TITLE	RESPONSIBILITIES
David Dailey	Professional Engineer/ Corporate HSO	Overall management of entire project from beginning to completion. Responsible for preparation and implementation of the HASP and reporting of all hazard incidents to appropriate enforcement agencies. Coordinates and oversees all field activities.
April Harrelson	Project Manager / Site HSO	Performs all field activities and is responsible for recognizing site hazards and reporting hazard incidents to Corporate HSO.

4.0 Scope of Work

Work to be performed will include installation and excavation activities.

4.1 Installation Activities

Installation activities generally involve preparing the site for installation activities and also the construction of the MPVE unit onsite. More specifically this will include:

- Preparing the site for work to be performed
- Saw-cutting concrete surface, excavating, and installing well vaults
- Installing polyvinyl chloride (PVC) extraction piping and subsurface utility lines
- Installing piping connections from extraction piping to wellhead
- Overseeing placing and leveling of remediation system
- Completing all piping connections from extraction and utility lines to remediation unit
- Completing all electrical connections
- Installing concrete block security fence
- Inspecting rotation on all electric motors
- Inspecting PVC piping, extraction lines, treatment system, and associated connections for leaks at start up

4.2 Operation and Maintenance Activities

Subsequent to the construction and installation of the MPVE unit, the unit must periodically undergo inspections or maintenance. CDG field personnel will inspect the unit on a weekly basis, taking certain instrument readings necessary to determine the progress of the remediation being performed at that particular site. Maintenance of the unit is performed on an as needed basis. The following applies to operation and maintenance activities associated with the MPVE unit:

- Inspecting proper working condition of telemetry system
- Lubricating motors
- Inspecting piping for leaks
- Inspecting belts on Liquid Ring Vacuum Pump (LRVP) system
- Periodic cleaning of equipment and components
- Periodic inspections of electrical connections
- Measuring induced vacuum in on site monitoring wells
- Removing silt and sludge buildup from knockout pot air stripper, filtration system and other system components

- Measuring air flow from MPVE unit
- Measuring liquid levels in wells
- Sampling effluent for discharge parameters
- Measuring volume of liquids removed and discharged

5.0 Chemical Hazards

When conducting the aforementioned corrective action activities, the primary chemicals of concern are gasoline.

5.1 Gasoline and Diesel

Gasoline and diesel are substances to be potentially encountered in the soil and groundwater at the site. Gasoline components include benzene, toluene, ethylbenzene, and xylenes (BTEX). Diesel components may include anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, fluorene, naphthalene, phenanthrene, and pyrene.

5.2 Hazard Identification

During the corrective action activities, many hazards or potential hazards may be encountered when dealing with gasoline or diesel. This section serves as a guideline in recognizing hazards associated with these chemicals that exist or may potentially arise during field activities. Recognition is the first step in eliminating exposure to these hazards.

Occasionally methyl-tertiary butyl ether (MTBE) is encountered. MTBE has been used since 1979 as an oxygenate to gasoline in order to decrease carbon monoxide production in cars, particularly older model cars; however, MTBE has been determined to be a potential carcinogen. MTBE has low taste and odor thresholds, which can make a water supply non-potable even at low concentrations.

Exposure to MTBE will only be seen through exposure to gasoline containing MTBE and the effects of gasoline containing MTBE are relatively similar to gasoline not containing MTBE. The following are hazards associated with exposure to gasoline:

- Contact may irritate or burn the skin and eyes and absorption through the skin may be poisonous
- Vapors may be poisonous if inhaled and are irritating to the respiratory tract
- Vapors are an explosion hazard and may travel to a source of ignition and produce flashback
- A gasoline fire may produce irritating and poisonous gases
- Gasoline and diesel are flammable/combustible materials that may be ignited by heat, sparks, or flames, and a gasoline container may explode when exposed to heat or fire

The primary hazard associated with exposure to gasoline is the inhalation of vapors. The Material Safety Data Sheets (MSDS's) are presented in Attachment A.

5.3 Hazard Prevention

Preventing exposure to chemical hazards generally requires the use of personal protective equipment (PPE). Level D equipment will provide the protection necessary to prevent exposure to these hazards. Level D equipment is discussed further in Section 10.1, Personal Protective Equipment.

5.4 Symptoms and First Aid Procedures

Many of the constituents found in gasoline and diesel act as central nervous system (CNS) depressants. The following table includes first aid measures for CNS depressants, which affect a person through inhalation (breathing), dermal (skin), or ingestion (mouth) exposure. In addition, the eye can be very sensitive to exposure to chemicals and is therefore included in the following table:

ROUTES OF EXPOSURE	SYMPTOMS	TREATMENT
Inhalation	Dizziness, nausea, lack of coordination, headache, irregular and rapid breathing, weakness, loss of consciousness, coma	Bring victim to fresh air. Rinse eyes or throat with plenty of water, if irritated. If symptoms are severe (victim vomits, is very dizzy or groggy, etc.), evacuate to hospital. Be prepared to administer CPR if certified. Monitor victim for at least 48 hours.
Dermal	Irritation, rash, or burning	Flush affected area with water for at least 15 minutes. Apply clean dressing and get medical attention.
Ingestion	Dizziness, nausea with stomach, cramps, loss of consciousness, coma	Evacuate victim to hospital. Do not induce vomiting.
Eye	Redness, irritation, pain, impaired vision	Flush with an abundant amount of water for at least 15 minutes. If severe, seek medical attention immediately.

6.0 Equipment/Operational Hazards

The following sections will address the hazards, preventative measures, and first aid procedures associated with the drill rig, backhoes, and other heavy equipment. The drill rig used during these field activities generally requires the use of augers for probing. These augers are designed to rotate in a circular motion while being forced downward through the soil. Field personnel are required to assemble and disassemble these parts. Contact with

these rotating parts is one recognized hazard. In addition, the machinery also contains parts that become increasingly heated during operation.

6.1 Hazard Identification

There are several hazards associated with use of any type of drill rig and heavy machinery while performing corrective action activities. Generally during these field operations, the general public may become fascinated with the operation and approach the work area. All unauthorized personnel are required to remain 100 feet away from the work area. The site HSO officer will be responsible for keeping all unauthorized personnel away from the work area. The hazards associated with the use of a drill rig or other heavy machinery is as follows:

- Gasoline vapors from nearby dispensers can potentially enter the diesel-operated engine thereby causing fire/explosion hazards
- Rotating augers may catch onto gloves or clothing thereby pulling hands arms into the rotating machinery
- Drilling equipment may rupture hydraulic hoses thereby releasing hydraulic fluids
- Engine and exhaust system of an engine are extremely hot during and following operation
- Potential contact with overhead and underground utilities
- Open excavations/boreholes can be the source of trips and falls
- Digging machinery such as backhoes may puncture subsurface utilities
- Operators of heavy machinery may be unable to locate pedestrians near the operating equipment; therefore, all field personnel are to remain with eye contact of the operator at all times during operation

6.2 Hazard Prevention

Hazards associated with heavy machinery can easily be avoided with additional planning. The key to avoiding these hazards includes being familiar with the equipment and the process. In addition, being familiar with and implementing the precautionary measures listed below may reduce or eliminate the risks of a hazardous situation.

- Wear hard hat when working near or around the machinery
- Wear safety glasses when performing maintenance to machinery or power tools
- Shut down the machine engine when repairing or adjusting equipment
- Prevent accidental starting of engine during maintenance procedures by removing or tagging ignition key
- Block wheels or lower leveling jacks and set hand brakes to prevent equipment from moving during drilling procedures
- When possible, release all pressure on hydraulic systems, drilling fluid systems, , and air pressure systems of heavy machinery prior to performing maintenance
- Know the location of the emergency shut-off switch for all equipment
- Avoid contact with engine or exhaust system of engine following its operation

- Avoid using gasoline or other volatile/flammable liquids as a cleaning agent on or around heavy machinery
- Replace all caps, filler plugs, protective guards or panels, and high-pressure hose clamps, chains or cables moved during maintenance prior to excavation
- Avoid wearing rings or jewelry during drilling or installation procedures
- Be aware of all overhead and underground utilities
- Avoid alcohol or other CNS depressants or stimulants prior to excavation
- Avoid contact with equipment parts during freezing weather. Freezing of moist skin to metal can occur almost instantaneously
- Shut all field operations during an electrical storm
- Do not operate heavy equipment within 20 feet of overhead power lines

6.3 Symptoms and First Aid Procedure

Hazards associated with heavy equipment were identified in Section 6.1. Unlike hazards associated with temperature or chemicals, symptoms will not be apparent with these types of hazards. In addition, these hazards will occur rapidly as opposed to over a period of time. Due to the size and composition of hydraulic vehicles, exposure to these hazards will range from extremely serious to life-threatening; therefore, CDG requires that exposed field personnel seek medical attention at the nearest medical facility and the Project Manager be notified immediately. A site location map to the nearest hospital is presented in Attachment B.

7.0 Temperature Hazards

Another hazard associated with corrective action activities involves working in extreme weather conditions. Temperatures in the Southeast USA during the spring, summer, and occasionally the fall seasons can vary from mild to extremely hot. During this season, extra precautions are necessary to prevent hazards associated with elevated temperatures, which result in various forms of heat stress. In addition, the Southeast is known for its rather mild winter condition; however, on occasion, the Southeast may experience freezing conditions; therefore, precautions are also necessary to prevent hazards associated with these extreme temperatures.

7.1 Heat

As stated in OSHA's regulatory guidelines for heat exposure operations involving high air temperatures, radiant heat sources, high humidity, direct physical contact with hot objects, or strenuous physical activities have a high potential for inducing heat stress. Additional factors to consider in the determination of heat stress on an individual include age, weight, degree of physical fitness, degree of acclimatization, metabolism, use of alcohol or

drugs, and a variety of medical conditions such as hypertension (high blood pressure). The following sections will identify the hazards associated with heat stress, the measures needed in order to prevent exposure to these hazards, and first aid procedures in the event exposure to these hazards should occur.

7.1.1 Hazard Identification

Heat stress is a major hazard, especially for workers wearing protective clothing. Depending on the ambient conditions and the work being performed, heat stress can occur very rapidly- within as little as 15 minutes. The key to preventing excessive heat stress is educating personnel on the hazards associated with working in heat and the benefits of implementing proper controls and work practices. The hazards associated with heat stress range from heat fatigue (mild discomfort) to heat stroke (extreme danger, which may result in death, and are discussed in the following sections.

7.1.1.1 Heat Fatigue

Heat fatigue occurs due to a lack of acclimatization (adjusting one's tolerance to work in elevated temperatures). Acclimatization is a gradual process. This process should include all field personnel being permitted to work in elevated temperatures in specified increments. On a daily basis, the maximum allowable work period should gradually be increased until the worker is able to perform his/her duties more proficiently under these conditions. The use of an acclimatization program is recommended in the regulatory guidelines established by OSHA.

7.1.1.2 Heat Rash

Heat rash (prickly heat) is the most common heat stress factor, and may result from continuous exposure to heat or humid air where the skin remains wet due to lack of evaporation. Under these conditions, sweat ducts become plugged, and a skin rash appears, generally in areas where clothing is restrictive. This uncomfortable rash can be prevented by resting in a cool place during breaks and by implementing good daily personal hygiene.

7.1.1.3 Heat Collapse

Heat collapse is commonly referred to as "fainting." Fainting generally occurs when the brain does not receive enough oxygen. As a result of this condition, the exposed individual may lose consciousness. Heat collapse is rapid and unpredictable; therefore, acclimatization is an important factor in preventing this condition.

7.1.1.4 Heat Cramps

Heat cramps are muscular spasms, which usually occur in the abdomen or limbs due to loss of electrolytes following profuse sweating. Cramps are caused by either too much or too little salt intake. During the sweating process, salt exits the body; therefore, without the proper replenishment, the body experiences an electrolyte imbalance thereby inducing heat cramps. Thirst cannot be relied upon as a guide to the need for water. When working in hot environments, water must be replenished every 15 to 20 minutes.

7.1.1.5 Heat Exhaustion

Heat exhaustion is a result of overexertion in hot or warm weather. It is highly possible for an onsite worker to experience heat exhaustion due to the use of worker-protective coveralls, boots, gloves, and respirator protection, even when ambient temperatures are mild. Fainting may also occur with heat exhaustion. This can become an extreme hazard if operating heavy machinery.

Caution: Individuals with heart problems or on a “low sodium” diet who work in these environments should consult a physician and Corporate HSO prior to working in these conditions.

7.1.1.6 Heat Stroke

Heat stroke is the most severe form of heat stress. The body’s temperature control system is maintained through sweat production. Perspiration is a cooling process for the body and keeps the body core temperature within a stable range. During heat stroke, sweat production is inhibited and the body temperature begins to rapidly rise. Brain damage and death may occur if body core temperature is extremely elevated and is not reduced.

7.1.2 Hazard Prevention

Hazards associated with temperature extremes can also be prevented with additional planning and preparation. The hazards associated with temperature can range from heat fatigue to heat stroke as described previously in Section 7.1.1 Measures to ensure the prevention of temperature hazards are as follows:

- Adhere to acclimatization process by exposing field personnel to progressively longer periods of time in hot environments.
- Schedule work for early morning or evening during warm weather
- Work in shifts; limit exposure time of personnel and allow frequent breaks
- Have cool liquids at an Exclusion Zone border for exposed personnel to continuously replace body fluids. As stated in the previous section, OSHA recommends that fluids, preferably water and/or a water-electrolyte solution be replenished every 15 to 20 minutes.
- Avoid caffeine and alcoholic beverages both during work hours and 24 hours prior to performing field activities

The site HSO or designee should continually monitor personnel for signs of heat stress. If any signs of heat disorders are apparent, all field personnel must immediately rest and replenish fluids until body core temperature is lowered and remains stable.

7.1.3 Symptoms and First Aid Procedures

As discussed previously in Section 7.1.1, hazards associated with heat stress range from heat fatigue to heat stroke. Taking precautionary measures to ensure that personnel are not exposed to extreme temperatures for long periods of time can prevent these hazards. First aid measures for heat fatigue, heat rash, and heat collapse include taking frequent breaks so that the body core temperature can cool down. The following table includes first aid measures for signs of overexposure to heat.

TEMPERATURE HAZARDS	SYMPTOMS	TREATMENT
Heat Fatigue	Impaired performance of skilled sensorimotor, mental or vigilance jobs	No known treatment. Victim should be placed under cooler conditions until body core temperature lowers.
Heat Rash	Rash due to plugged sweat ducts, generally where clothing is restrictive	Keep dry towels or paper towels at the site to dry skin when excessive sweating occurs. Rash usually disappears when affected individual returns to cooler environment.
Heat Collapse	Loss of consciousness	Attempt to awaken individual. Relocate victim to a cooler area until body core temperature lowers and replenish fluids. Victim should rest for a few days.
Heat Cramps	Uncontrollable muscle spasms	Apply warm, moist heat and pressure to reduce pain. Give electrolyte drinks by mouth. Victim should intake additional potassium (Bananas are good potassium source).
Heat Exhaustion	Pale, clammy skin, profuse perspiration, weakness, headache, and nausea	Get victim into shade or cooler place. Immediately remove any protective clothing. Victim should drink plenty of fluids. Victim should lie down with feet raised. Fan and cool victim with wet compresses. If vomiting occurs, transport to hospital. Victim should rest for a few days.
Heat Stroke	Pale, dry skin due to lack of perspiration, weakness, unconsciousness	Immediately take precautions to cool body core temperature by removing clothing and sponging body with cool water, or placing in tub of cool water until temperature is lowered sufficiently (102°F). Stop cooling and observe victim for 10 minutes. Once temperature remains lowered, dry person off. Use fans or air conditioning, if available. Do not give the victim stimulants. Transfer to medical facility. Under no condition is the victim to be left unattended unless authorized by a physician.

8.0 Explosion/Electrocution Hazards

As stated previously in Section 4.1, extensive efforts are made in order to determine the location of subsurface utilities prior to corrective action activities. Efforts are made to obtain the location of underground utilities through the Line Locator Services, and utility companies are notified in advance to perform a site inspection and utility marking; however, the potential for a subsurface utility to go unnoticed exists. Therefore, the hazards associated with exposure to these utilities are identified and preventative measures and first aid procedures are discussed further in the following sections.

8.1 Explosion

Primarily when dealing with subsurface utilities, two potentially life-threatening hazards exist. The first hazard identified in association with subsurface utilities during excavation activities are discussed further in the following section.

8.1.1 Hazard Identification

The main hazard associated with puncturing a subsurface utility gas line is explosion. By releasing gas (usually natural gas, which is generally methane gas or propane gas) into the atmosphere, explosive conditions are favorable; therefore, ignition sources must be immediately eliminated in the event a gas release occurs. Due to the flammability of gasoline, ignition sources will be minimized; however, the engines are needed during field activities. Therefore, the only alternative to reducing the explosion hazard is to stop the release as soon as possible. However, when dealing with gases under pressure, the volatilization process may occur at such a rapid speed that an explosive situation is inevitable.

8.1.2 Hazard Prevention

Preventative measures are ensured prior to field activities. These measures generally encompass locating subsurface utilities. In addition, CDG will request local utility companies to perform site inspections and mark all subsurface utilities. In addition to this notification, if a particular subsurface utility is not identified and CDG suspects the utility to exist, CDG will take additional precautionary measures to ensure the suspected utility does not exist. These measures generally include locating utility meter boxes, etc. In addition, a field technician or subcontractor will generally probe the ground with a small rod in order to possibly identify the existence of subsurface utilities. This is conducted usually when machinery reaches 2-3 feet below the ground surface (ft-bgs).

8.2 Electrocution

8.2.1 Hazard Identification

The main hazard associated with puncturing a subsurface electrical line or coming into contact with an overhead power line is electrocution. When dealing with electricity, all things are classified as either conductors or insulators. Conductors allow electricity to pass through them while insulators prevent electricity to pass through. Examples of conductors are metals, wood, and water, and examples of insulators are rubber and PVC. Humans are also classified as conductors; therefore, contact with electrical sources can be fatal.

Because the heavy machinery is metal, which has been classified as one of the best sources of electrical conduction, contact with exposed electrical lines will allow current to flow. The National Electrical Code (NEC) has determined that 20 milliamps (mA) of current can be fatal. For comparison, a common household circuit breaker may conduct 15, 20, or 30 amps of electrical current.

8.2.2 Hazard Prevention

As stated previously in Section 8.1.2, preventative measures to locate subsurface and overhead electrical lines prior to corrective action activities are required by CDG. CDG will notify local utility companies to provide a site inspection and mark any existing subsurface electrical lines. In addition, CDG will contact the local power provider to insulate overhead lines if necessary. When dealing with the electrical components of the dewatering system, the following precautionary measures may prevent exposure to electrocution:

- Avoid contact with exposed connections/wiring and other related components
- If unfamiliar with the system, do not attempt contact with any component
- Call the Project Manager if unsure of any connections associated with the operations of the system.

8.2.3 Symptoms and First Aid Procedures

As discussed previously in Section 8.2.1, the hazard associated with puncturing subsurface electrical utilities and contacting electrical components of dewatering system is electrocution. The primary route of exposure is contact. The transmission of electricity is allowed because the metal equipment serves as a conductor for electrical current. Symptoms and treatment for exposure to electrical current is presented in the following table:

Caution: NEVER attempt to dislodge or remove someone that is contacting a high voltage line Use an insulating material (PVC) to release the victim from the electrocution source.

9.0 Miscellaneous Hazards

The last hazard identified when performing corrective action activities has been classified as miscellaneous hazards due to the variety of these hazards. These hazards generally are nothing more than nuisances and with additional planning should be entirely avoidable; however, there are instances in which exposure to these hazards will occur. Therefore, these hazards are identified and preventative measures and first aid procedures are discussed in further detail in the following sections.

9.1 Hazard Identification

Occasionally, exposure to common nuisances may potentially result in a life-threatening situation. For example, a wasp or bee sting for some individuals only causes irritation or localized soreness; however, to others with little tolerance for wasp or bee venom, an allergic reaction can result which could potentially lead to death if not treated immediately. Therefore, allergic reactions to these insects have been identified as a potential hazard. In addition to the insects, contact with black widow spiders (red hourglass), brown recluse spiders (violin shape on back), and snakes are also potential hazard.

9.2 Hazard Prevention

Prevention, with regards to miscellaneous hazards, is more difficult to plan ahead. Generally, prior to conducting corrective action activities, the primary location for the activities has been established; therefore, barricades such as cones and company vehicles can be placed around the work area to prevent exposure to incoming and ongoing vehicles. However, the limitation to using cones is that they are often small and unnoticeable to drivers once inside the vehicles; therefore, the best prevention with regards to this miscellaneous hazard is to constantly be aware of your surroundings. This preventative measure can also be applied to exposure to insects, snakes, and spiders. Be aware of your surrounding when working around dark, secluded areas such as cracks and crevices, where snakes, spiders, and mice like to hide.

9.3 Symptoms and First Aid Procedures

If an employee or subcontractor shows any signs of an allergic reaction (anaphylactic shock, hives, or difficulty breathing) to a sting or bite, immediately seek medical attention at the nearest hospital. In the event that an operating vehicle strikes a person, seek medical attention immediately. In the meantime, a first aid kit and eye wash bottle will be provided by CDG and should be kept in all company vehicles. If field personnel are aware of their allergic reactions to insect bites, CDG requires that medication be kept on hand during field activities and at least one other field technician be made aware of the medication in the event of an allergic reaction should occur.

10.0 Additional Precautions

Additional precautions have been implemented in order to ensure overall safety for all field personnel. The safety protocols listed in this segment are to be considered the minimum requirements to be met by all field personnel engaging in corrective action activities.

10.1 Personal Protective Equipment

PPE is the most effective measure to prevent exposure to chemical hazards. There are four levels of PPE protection ranging from Level A to Level D equipment. Level A protection serves as the most conservative protective equipment, and Level D protection serves as the least conservative protective equipment. These levels are described further in the following table:

LEVELS OF PPE PROTECTION	PPE REQUIREMENTS
--------------------------	------------------

Level A	Worn when the highest level of respiratory, skin, and eye protection is necessary.
Level B	Worn when the highest level of respiratory protection is needed, but a lesser level of skin protection is necessary.
Level C	Worn when the criteria for using air-purifying respirators are met, and a lesser level of skin protection is necessary.
Level D	Refers to work conducted without respiratory protection. This level should be used only when the atmosphere contains no know or suspected airborne chemical or radiological contaminants and oxygen concentrations are between 19.5 % and 23.0%

Level D protective clothing, as indicated below, shall be considered the minimum requirements for installation and excavation operations:

- Hard hat
- Coveralls*
- Non permeable gloves
- Steel-toe, non-permeable boots
- Hearing protection*
- Safety goggles (chemical)*

*These items area mandatory on an “as needed” basis. Generally, normal site conditions do not warrant the use of this equipment; however, under certain conditions where large amounts of free product are encountered, the issue of coveralls and safety goggles may be warranted. Safety goggles and hearing protection are mandatory when near the drill rig to reduce stress on the ear and also prevent objects from the soil or drill rig from lodging in the eye.

Equipment may be upgraded to Level C depending on the site conditions and/or monitoring results. Level C protection, in addition to Level D protection, includes the following:

- Rubber/chemical resistant outer gloves
- Face-shield if splash hazards exists
- Outer disposable booties
- Half-mask respirator

10.2 Signs, Signals, and Barricades

As stated previously in Section 9.1, corrective action activities are generally conducted at retail gasoline facilities and convenience stores, and are therefore, high traffic areas. All CDG field personnel must be aware of his/her surroundings at all times. In addition, the items listed below will be provided to secure the area in order to protect all field personnel as well as the general public.

- Utilize barricades to protect workers, pedestrians and vehicles from work activities

- Post area for “NO SMOKING”
- Utilize cones to protect workers from incoming and ongoing vehicles

10.3 Fire Protection and Prevention

As stated previously in Section 5.1, gasoline is a highly flammable substance. CDG requires that the work area be posted with “NO SMOKING” signs in an attempt to prevent fires from occurring; however, as a secondary precaution CDG plans to implement the following:

- Maintain a 20 lb. ABC Dry Chemical fire extinguisher on site at all times
- Eliminate ALL ignition sources in the vicinity of any releases
- The contractor will clean up all small spills using absorbent materials or by pumping

10.4 Storage and Decontamination

During the corrective action activities, impacted soils will be encountered. Groundwater will be treated and pumped to an NPDES outfall. Contaminated soil will be temporarily stored until transported for disposal. Decontamination procedures will be implemented should chemical exposure occur. The procedures are detailed below:

- Avoid contact with liquid gasoline or diesel
- Place contaminated soil on visqueen and cover once removed from the excavation
- Change any product contaminated soil immediately
- Wash any contaminated skin surfaces immediately with soap and water

Caution: All personnel are required to wash hands at the completion of work, before and after restroom use and before eating in order to prevent dermal contact with or ingestion of contaminants encountered during field activities.

11.0 Emergency Contingency Plan

If an incident occurs that requires declaring an emergency, all personnel will assemble at a designated emergency meeting location for further instruction. Arrangement for decontamination, evacuation and/or transport will be made at that time. The client and appropriate CDG personnel will be notified of the incident as soon as possible.

11.1 Notification/Reporting Procedures

In the event of an emergency, CDG Project Manager will be notified as soon as possible regarding the nature of the incident and emergency service contact will be notified as needed (see Section 11.7, Contingency Contacts). It is the responsibility of the Site HSO to report all incidents to the CDG Corporate HSO so that the required reporting procedures may be implemented.

11.2 Hazardous Substance Release

In the event that potentially hazardous substances migrate from the work zone and potentially endanger unprotected personnel or the community all on site activities will cease until the release is brought under control. CDG will immediately notify the proper authorities so that they may be able to ensure that public health and safety is maintained throughout this process event to the extent of evacuation if necessary.

11.3 Personnel Injury

In the event of an injury, all personnel will assemble at the designated emergency meeting location. The Site HSO, prior to the beginning of filed activities should designate this location. If the injured person is immobile one or more persons should remain nearby to provide any necessary first aid techniques. If medical help is necessary, the Site HSO will summon the appropriate assistance for transportation to the nearest medical facility. Due to the potential for these situations, CDG recommends that at least one qualified person be CPR/First Aid certified.

11.4 Evacuation Plan

Gasoline and diesel are flammable substances; therefore, a fire/explosion potential exists during the excavation activities. In the event of an onsite evacuation, the following plan will be implemented:

- A signal consisting of one continuous blast of a vehicle or air horn will be used
- All personnel will immediately evacuate the area and report to the designated emergency meeting location for further instruction

11.5 Spill Prevention and Response

In the event of a leak or spill, the area will be blocked using barricades, and the spill contained until absorbed and removed by authorized personnel. Unauthorized persons will be denied access to the area until all spills have been removed and field operations completed. CDG will follow prescribed procedures for reporting and responding to large releases by notifying the National Response Center (see Section 11.7). All materials will be disposed of according to regulatory guidelines.

11.6 Emergency Communication

In the event of an emergency situation, the following standard hand signals will be used onsite as a means of communication:

- Hand gripping throat-(cannot breathe)
- Grip partner's wrist or both hands around waist- (leave area immediately)

- Hands on top of head- (need assistance)
- Thumbs up- (OK, I am all right, I understand)
- Thumbs down- (No, negative)
-

11.7 Contingency Contacts

In the event of an emergency, CDG has provided several emergency contacts. These contacts, along with phone numbers, are listed in the following table. The Site HSO will be responsible for the notification of these contacts in the event of an emergency.

AGENCY	CONTACT	TELEPHONE NO.
Fire Department		911
Police Department		911
Ambulance		911
Hospital		1-334-418-4100
Corporate HSO	David Dailey	1-205-403-2600
Project Manager	April Harrelson	1-334-222-9431
EPA RCRA-Superfund Hotline		1-800-424-9346
Chemtrec (24 hours)		1-800-424-9300
Bureau of Explosives (24 hours)		1-202-293-4048
Centers for Disease Control (Biological Agents)		1-404-633-5353
National Response Center		1-800-424-8802

Medical Facility

Name of Hospital: Vaughan Regional Medical Center

Address: 1015 Medical Center Parkway, Selma, AL

Phone: 334-418-4100

Route to Hospital: see attached map with driving directions

Travel Time from Site: 6 minutes

Distance to Hospital: 2.6 miles

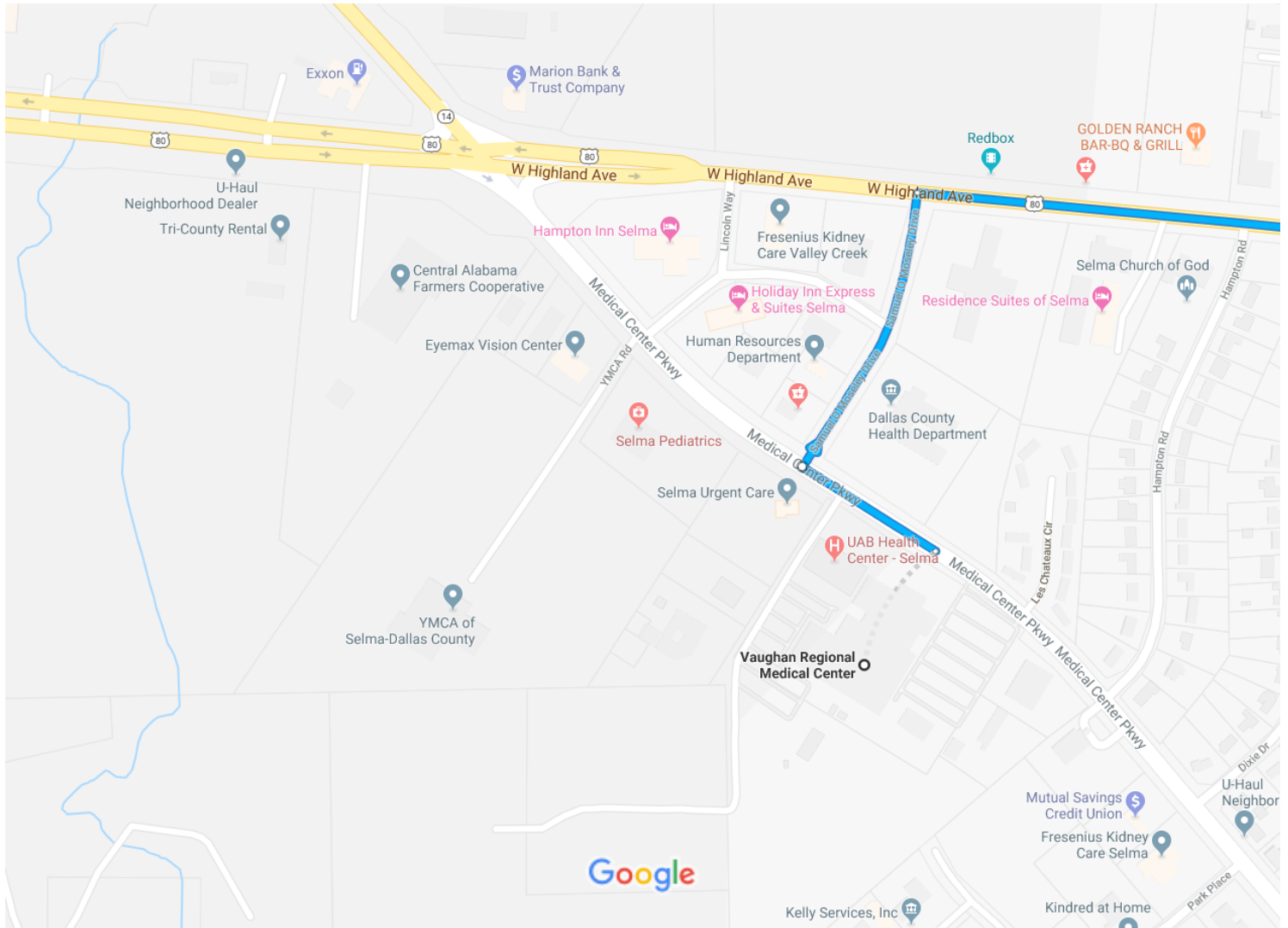
Name/Number of 24-hour Ambulance Service: 911

In cases of construction accidents, rapid notification to OSHA is required.



Vaughan Regional Medical Center to COUGAR OIL 11
Selma, AL 36701

Drive 2.6 miles, 6 min



Map data ©2018 Google 200 ft

Vaughan Regional Medical Center

6748, 1015 Medical Center Pkwy, Selma, AL 36701

- ↑ 1. Head northwest on Medical Center Pkwy toward Samuel O Moseley Dr 0.1 mi

- ↘ 2. Turn right onto Samuel O Moseley Dr 0.2 mi

- ↘ 3. Turn right onto W Highland Ave
i Pass by Pizza Hut (on the left in 1.2 mi) 1.8 mi

- ↙ 4. Use the left 2 lanes to turn left onto Broad St 0.2 mi

- ↑ 5. Continue onto Citizens Pkwy
i Destination will be on the right 0.3 mi



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UIC Permit Application

APPENDIX F

**ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT (ADEM)
NOTICE OF INTENT – UIC GENERAL PERMIT NUMBER ALIG010000**

Instructions: This form should be used to submit a Notice of Intent for coverage under UIC General Permit Number ALIG010000, which is the general permit authorizing discharges associated with injection of air, oxygen, or ozone to aid in the remediation of existing soil and/or groundwater contamination. Answer all questions. Incomplete or wrong answers will result in processing delays and possible denial of the permit application. If space is insufficient to address any item below please continue answer on an attached sheet of paper. Commencement of activities applied for in this Notice of Intent (NOI) are not authorized until permit coverage has been issued by the Department.

Permit Applicant Information

- A. Applicant Name: Cougar Oil Inc.
- B. Responsible Official (RO)*: Larry Jones, Vice President
- C. RO Mailing Address: P.O. Box 1800, Selma, AL 36702
- D. RO Phone Number: 334-875-2023
- E. RO Email Address: jlarry@cougaroil.com

Property Owner Information (if different from the applicant)

- F. Name: Larry Jones, Vice President
- G. Mailing Address: P.O. Box 1800, Selma, AL 36702
- H. Phone Number: 334-875-2023
- I. Email Address: jlarry@cougaroil.com

Facility Information

- J. Facility Name: Cougar Oil #11
- K. Physical Address: 2800 Citizens Parkway, Selma, AL 36701
- L. Phone Number: 334-875-2023
- M. Latitude: 32.437667 Longitude: -87.021889
- N. Directions to site:

Intersection of Citizens Parkway and Cloverdale Road in Selma, Alabama.

Process Information

- O. Describe the fluids and/or pollutants to be injected and proposed operational procedures. Include estimated average and maximum daily injection rates as well as total volume to be injected:

Atmospheric air and/or oxygen will be injected in up to 8 points during periodic MEME events. The average injection rate is estimated to be 20 cfm.

P. Number of injection wells (each point of injection is considered a separate well): 8

Signatures

Certification: I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

RO Signature: _____ Date Signed: _____

RO Name: _____ RO Title: _____

***NOTE:** This Notice of Intent must be signed by the responsible official who represents the permit applicant. Please check the appropriate box indicating the responsible official (only the people listed below may sign this Notice):

- in the case of a corporation, the principal executive officer of at least the level of vice-president;
- in the case of a partnership, a general partner;
- in the case of a sole proprietorship, the owner;
- in the case of a municipal, state, federal, or other public agency, either a principal executive officer or ranking elected official.



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TASKS PERFORMANCE SUMMARY

APPENDIX G

Task Completed by Personnel/Title:	Michelle Grantham,Senior P.M.	David Dailey, P.E.	April Harrelson, PM	Ann Dyer, Geologist	Sheray Booker, Drafter	Patricia Horwath, Admin	Kim Ballard, Admin	Tally Carter, Admin
Project Management			X - PM					
Work Plan Preparation/Review			X - PM					
Cost Proposal Preparation/Review	X - REV		X - PM				X	X
Field Work								
Data Interpretation			X - PM	X				
Drafting					X			
Report Preparation/Review		X - REV	X - PM	X		X	X	
Payment Request Preparation/Review	X - REV		X - PM			X	X	

Notes:

DO=Drilling Oversight

BL=Boring Log Description/Soil Classification

WG=Well Gauging

GSC=Groundwater Sample Collection

MEME=MEME Oversight

PM=Project Management

O&M=Routine Operation & Maintenance

REV=Review