



December 18, 2012

Mr. Wayne P. Bankert
Senior Regulatory & Environmental Coordinator
Laramie Energy II, LLC
601 28 1/4 Rd. Suite D
Grand Junction, CO 81506

RE: Fuqua 18-15 Well Pad Separator Release Remediation and Confirmation Sample Results for COGCC Spill Tracking #2222753, Location ID# 324766, Rem #6938 Olsson Project #012-0225

Dear Mr. Bankert:

Olsson Associates (Olsson) conducted an initial site characterization on January 30, 2012, following a hydrocarbon release from the Fuqua 18-15 well pad separator that occurred on January 29, 2012. The extent of impacts to the east of the site was unknown since the wind had carried the hydrocarbons across the pasture during a snow storm. Olsson conducted an additional site investigation and sampling of the impacted area east of the onsite vertical separator following an onsite meeting with you and Alex Fischer with the Colorado Oil and Gas Conservation Commission (COGCC) on April 26, 2012. The general site location is shown on **Figure 1**.

Alternative options for remediating the petroleum hydrocarbon impacted vegetation and surface soils that resulted from the January 29, 2012 release were discussed during the meeting. The original plan for remediating the impacted vegetation, consisting primarily of sage brush, native grasses, and forbs, was to perform a controlled burn under the direction of the Jackson County Fire District. A fire break was constructed around the perimeter of the spill area; however, two days before the burn permit was to be issued, Jackson County implemented a county-wide fire ban due to dry conditions and lack of precipitation.

The alternate plan was to spray a surfactant and water solution onto the impacted vegetation to breakdown the residual petroleum hydrocarbons and aid bioremediation of the impacted soils using native soil microbe populations. The solution would also contain nutrients needed to promote the biodegradation of the petroleum hydrocarbons by soil microbes.

The Fuqua Ranch planned on grazing cattle on the rangeland surrounding the Fuqua 18-15 well pad in May 2012. The impacted area was subsequently fenced off using three-strand barbed wire fence and T-posts to prevent cattle and wildlife from entering the spill area and the well pad.

Site remediation occurred on June 26, 2012 and involved using a tractor to spray a mixture of Earth Smart Solutions ESCH hydrocarbon cleaner and water over the impacted area. On November 1, 2012, Olsson Associates collected samples to assess the progress following the remediation effort. Sample locations are shown on **Figure 2** and the primary impact area firebreak, and confirmation soil sample analytical results are shown on **Figure 3**.

It appeared that the wind had carried the release more to the southeast at approximately 450 feet from the separator; however, the majority of the impacted vegetation was within this impact area as shown on **Figure 3**. The width of the impact area “fanned out” from the vertical separator and ranged from 160 feet to 200 feet at its widest aperture. “Fingers” and localized spots of impacted vegetation were noted where the wind had carried the petroleum hydrocarbons further out, but were more isolated. Petroleum hydrocarbon impacts were not noted out along the eastern extent of the fire break. New vegetation growth and wildflowers were noted in bloom during the April 26, 2012 site characterization activities.

The April 26, 2012 soil samples showed elevated DRO concentrations, and the BTEX and GRO concentrations were limited to the stockpiled vegetation that had been cleared from the area closest to the vertical separator. Concentrations of BTEX and GRO were either not detected or did not exceed COGCC Table 910-1 concentration levels in samples collected outside the stockpile. Confirmation soil samples SS16 and SS17 collected on November 1, 2012 were from 35 feet along, and from 110 feet, respectively, along the center line from the well pad. These locations were marked with pin flags during the April 2012 additional site characterization.

Site Remediation

On June 26, 2012 Olsson personnel met with Mr. Harry Corkle to apply the Earth Smart ESCH hydrocarbon cleaner solution over the impacted area using a John Deere 7412 tractor with a 150-gallon capacity polyethylene tank and sprayer boom. Two 5-gallon capacity plastic buckets containing the concentrated hydrocarbon cleaner were mixed with water obtained from a Fuqua Ranch pond to the south of the location. The COGCC Form 27 remediation work plan approval and a material safety data sheet and product specification sheet for the EarthSmart ESCH hydrocarbon cleaner are included in **Attachment A**.

The wind was blowing out of the west-southwest and gusts were estimated at 10 miles per hour (mph) to 20 mph. The remediation efforts focused on the area 100 feet to 450 feet east of the well pad where there was the greatest concentration of paraffins and staining had fanned out during the January 29 release.

The impacted area was treated again with a second tank of water and the second bucket of concentrated hydrocarbon cleaner. Mr. Corkle had a 1,000-gallon capacity water tank to refill the poly tank on the tractor. The ambient temperature during the spraying was between 80 °F and 90 °F. New vegetation growth consisting of native grasses and sage brush were noted during the remediation activities. Site photographs are presented in **Attachment B**.

September Site Inspection

Laramie Energy II personnel conducted a site inspection on September 13, 2012 to assess the progress following the June 26, 2012 remedy using the hydrocarbon cleaner solution. Site vegetation was observed coated in paraffin and other hydrocarbons during the January 2012 initial site visit. During the April 26, 2012 site visit, stained vegetation had started to recover and showed new growth and some were flowering. The September 2012 site photographs show that vegetation had recovered and staining had diminished following the June 2012 treatment. The September site photographs are also presented in **Attachment B**.

Confirmation Soil Sampling

Olsson personnel collected confirmation soil samples in the vicinity of where the initial samples and April 26, soil samples had been collected. A summary of the January 30 and April 26, 2012 site characterization soil sample results as compared to the COGCC Table 910-1 concentration levels is presented as **Table 1**. The confirmation soil samples were also submitted to Summit Scientific, Inc. for laboratory analysis of petroleum hydrocarbon constituents including gasoline range organics (GRO) by EPA Method 8260, diesel range organics (DRO) by EPA modified Method 8015, and oil range organics (ORO) by EPA modified Method 8015. Surface soil samples were not collected for analysis of benzene, toluene, ethylbenzene and xylenes (BTEX) since the previous samples did not show concentrations that were above the COGCC Table 910-1 concentration levels for BTEX as shown in **Table 1**. The laboratory analytical results are included in **Attachment C**.

Samples were analyzed for GRO since results for the initial and additional sampling showed elevated GRO concentrations only in the heaviest impacted areas closest to the separator contained BTEX and GRO concentrations. The results show that the highest impacts were in the DRO range.

Fiberglass tape measures were used to locate the flagging tape used to document the April 26, 2012 soil sample locations. Soil samples SS-5 and SS-6 were collected approximately 300 feet east of the vertical separator and 25 feet south and 25 feet north of the centerline of the release, respectively. Confirmation soil sample SS12 was collected near the SS5 location, and confirmation sample SS13 was collected near the SS6 soil sample location.

Soil samples SS-7 and SS-8 were collected approximately 400 feet east of the vertical separator, and 25 feet south and 15 feet north of the release centerline, respectively. Soil sample SS-9 was collected approximately 250 feet from the vertical separator, on the east side of the access road, and close to the centerline of the release. Confirmation soil sample SS14 was collected near the SS7 sample location, and SS15 was collected near the SS8 sample location. Confirmation soil sample SS11 was collected near the SS9 soil sample location.

The analytical results for the November 1, 2012 sample results are plotted on **Figure 4**. A summary of the previous site characterization sample results are shown in **Table 1** as compared to the COGCC Table 910-1 concentration levels and **Table 2** presents the November 1, 2012 soil confirmation samples following remediation.

Confirmation Soil Sample Results – November 1, 2012

Concentrations of GRO were not detected in any of the November 1, 2012 confirmation soil samples SS11, SS12, SS13, SS14, SS15, SS16, or SS17. The samples were submitted for analysis of the total petroleum hydrocarbon (TPH), or GRO, DRO, and ORO, and were not analyzed for BTEX since the characterization soil sample results showed that BTEX compounds were not detected in the site characterization samples.

The laboratory results show that concentrations of DRO and ORO were not detected at or above the method detection limit in the confirmation soil samples SS12, SS14, or SS15. Confirmation soil sample SS12 was located near soil sample SS5, approximately 300 feet east of the well pad, and 25 feet south of the centerline of the release. Confirmation sample SS14 was collected near soil sample SS7, approximately 400 feet east of the well pad and 25 feet south of the centerline of the release. Confirmation soil sample SS15 was collected near soil sample SS8, approximately 400 feet east and 15 feet north of the centerline of the release.

The laboratory analytical results for confirmation soil sample SS13 show that concentrations of DRO were not detected at or above the laboratory MDL. Concentrations of ORO were reported at 62 mg/Kg. Confirmation soil sample SS13 was collected near soil sample SS6, approximately 300 feet east of the well pad and 25 feet north of the centerline of the release.

The laboratory analytical results for confirmation soil sample SS16 collected 35 feet from the well pad along the centerline of the release show that concentrations of DRO were reported at 83 mg/Kg and that ORO concentrations were reported at 63 mg/Kg.

The laboratory reported a DRO concentration of 350 mg/Kg and an ORO concentration of 410 mg/Kg in confirmation soil sample SS-11. Combining both the DRO and ORO TPH ranges, these results show that TPH concentrations are greater than the COGCC Table 910-1 concentration level of 500 mg/Kg. Hydrocarbons in the DRO and ORO ranges are typically less mobile than in the GRO range. Confirmation soil sample SS-11 was collected near the SS-9 site characterization soil sample, or approximately 250 feet along the centerline of the release.

The laboratory analytical results for confirmation soil sample SS17 collected 110 feet along the centerline measured from the fence surrounding the well pad, show that concentrations of DRO were reported at 2,100 mg/Kg, and that ORO were reported at 1,700 mg/Kg. These concentrations are above the COGCC Table 910-1 concentration level of 500 mg/Kg for total petroleum hydrocarbons. Confirmation soil sample SS17 was collected near the impacted materials and debris stockpile located close to the Fuqua 18-15 well pad.

Conclusions

Petroleum hydrocarbon concentrations have been significantly reduced based on review of the laboratory analytical results for the January 30, 2012 initial site characterization, and the April 26, 2012 additional site characterization soil samples collected prior to the June 26, 2012 hydrocarbon cleaner solution remediation activities, as compared with the results of the November 1, 2012 confirmation soil sample analytical results.

With the exception of the DRO and ORO results for confirmation soil sample SS17, the confirmation soil sample results show that the concentrations of DRO and ORO are well below the COGCC Table 910-1 concentration level of 500 mg/kg, and that in many cases were not detected at or above the laboratory MDLs. This suggests that the EarthSmart ESCH hydrocarbon cleaner was effective in helping to break down the paraffins and petroleum hydrocarbons on the sage brush and soils over the majority of the impact area.

Additional treatment may be necessary for the impacted soils near SS17, and the stock pile of impacted materials, and the total petroleum hydrocarbon (TPH) concentrations near confirmation soil sample SS11. Although the individual ranges for DRO and ORO are less than 500 mg/Kg, the combined concentrations are above the COGCC Table 910-1 TPH concentration level of 500 mg/Kg. Treatment options may include mulching the impacted materials or additional spraying of the hydrocarbon degrader solution over this area in June 2013.

Sincerely,

Olsson Associates Inc.



James W. Hix
Senior Geologist

Attachments

TABLES

Table 1. Summary of Site Characterization Soil Sample Results Laramie Energy - Fuqua 18-15 Pad								
Soil Sample ID	Date Sampled	Laboratory Analytical Results						
		Benzene	Toluene	Ethylbenzene	Total Xylenes	GRO	DRO	ORO
		(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
COGCC Table 910-1 Concentration Levels		0.17	85	100	175	500	500	500
SS1	01/30/12	< 0.043	< 0.097	< 0.049	< 0.190	< 9.7	822	NA
SS2	01/30/12	< 0.047	< 0.110	< 0.053	0.410 J	12.8 J	8,250	NA
SS3	01/30/12	0.175	3.16	2.75	29.3	456	48,200	NA
SS4	01/30/12	35.9	174	44.4	353	4,430	36,100	NA
SS5	04/26/12	< 0.005	< 0.005	< 0.005	< 0.005	< 0.5	12,000	2,100
SS6	04/26/12	< 0.005	< 0.005	< 0.005	< 0.005	1.4	7,300	1,500
SS7	04/26/12	< 0.005	< 0.005	< 0.005	< 0.005	0.81	15,000	2,500
SS8	04/26/12	< 0.005	< 0.005	< 0.005	< 0.005	< 0.5	7,100	1,200
SS9	04/26/12	< 0.005	< 0.005	< 0.005	< 0.005	0.96	5,200	900
SS10	04/26/12	0.065	0.56	0.18	2.5	430	59,000	4,200

Notes:

NA = Not Analyzed

BTEX = benzene, toluene, ethylbenzene, and xylenes (EPA Method 8260B)

GRO = gasoline range organics (EPA Method 8260B)

DRO = diesel range organics (EPA modified Method 8015)

ORO = oil range organics (EPA modified Method 8015)

All concentrations reported in milligrams per kilogram (mg/Kg).

J = Value is estimated at a concentration above the Method Detection Limit but lower than the Reporting Limit

Values in **Bold** = Exceeds the Colorado Oil and Gas Conservation Commission (COGCC) Table 910-1 Soil Concentration Level

< = compound not detected above Laboratory Method Detection Limit (MDL)

See Figure 2 and Figure 3 for Soil Sample Locations

Table 2 Confirmation Soil Sample Results Laramie Energy - Fuqua 18-15 Pad

Confirmation Soil Sample ID	Date Sampled	Previous Site Characterization Soil Sample ID	Total Petroleum Hydrocarbon Range		
			GRO	DRO	ORO
			(mg/Kg)	(mg/Kg)	(mg/Kg)
COGCC Table 910-1 Concentration Level			500	500	500
SS11	11/01/12	SS-9	< 0.5	350	410
SS12	11/01/12	SS-5	< 0.5	< 50	< 50
SS13	11/01/12	SS-6	< 0.5	< 50	62
SS14	11/01/12	SS-7	< 0.5	< 50	< 50
SS15	11/01/12	SS-8	< 0.5	< 50	< 50
SS16	11/01/12	SS-10	< 0.5	83	63
SS17	11/01/12	CL: 110 ft	< 0.5	2,100	1,700

Notes:

NA = Not Analyzed

GRO = gasoline range organics (EPA Method 8260B)

DRO = diesel range organics (EPA modified Method 8015)

ORO = oil range organics (EPA modified Method 8015)

All concentrations reported in milligrams per kilogram (mg/Kg).

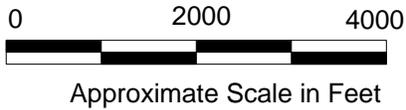
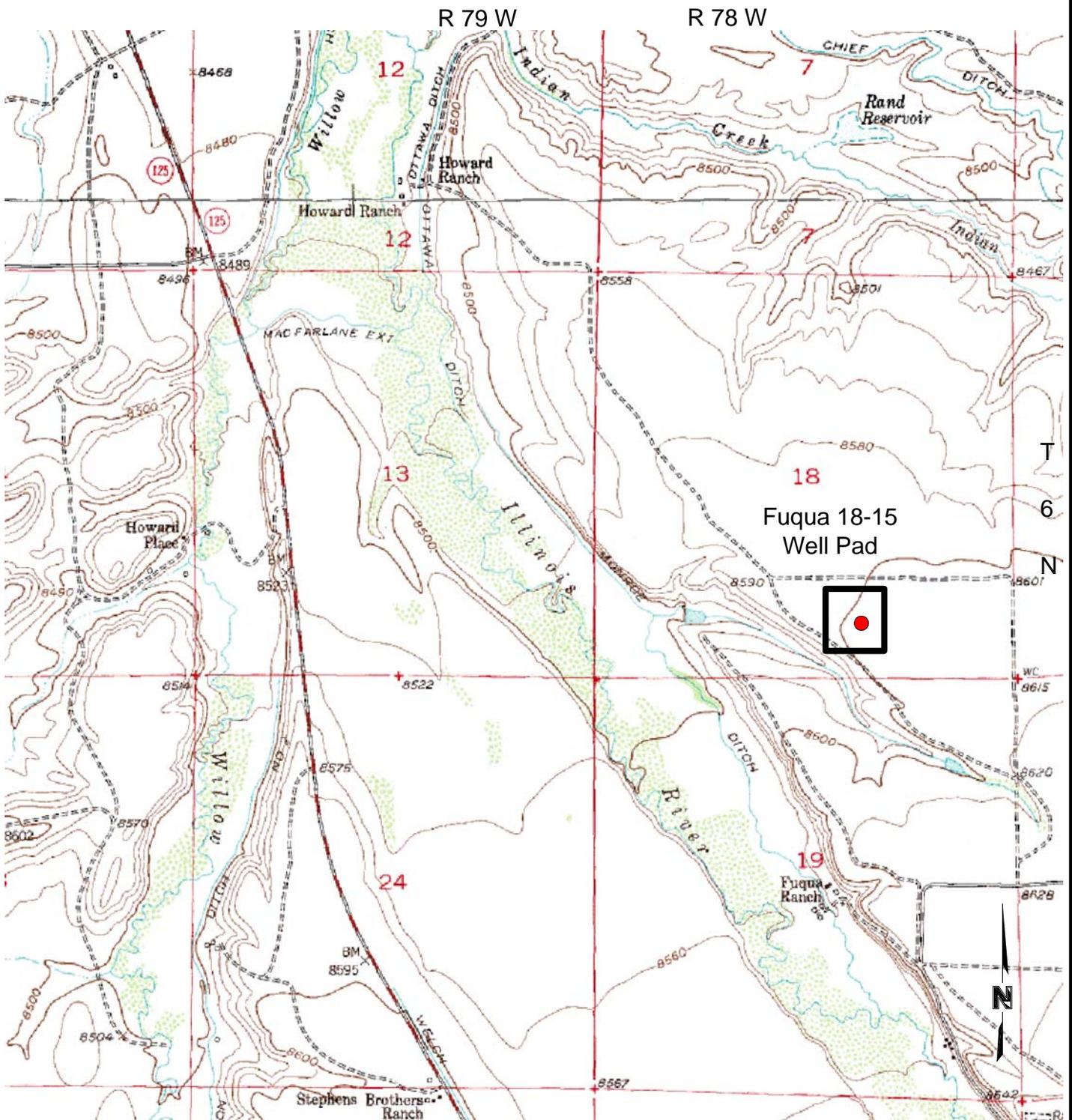
Values in **Bold** = Exceeds the Colorado Oil and Gas Conservation Commission (COGCC) Table 910-1 Soil Concentration Level

< =compound not detected above Laboratory Method Detection Limit (MDL)

See Figure 2 and Figure 4 for Soil Sample Locations

CL: centerline of the release

FIGURES



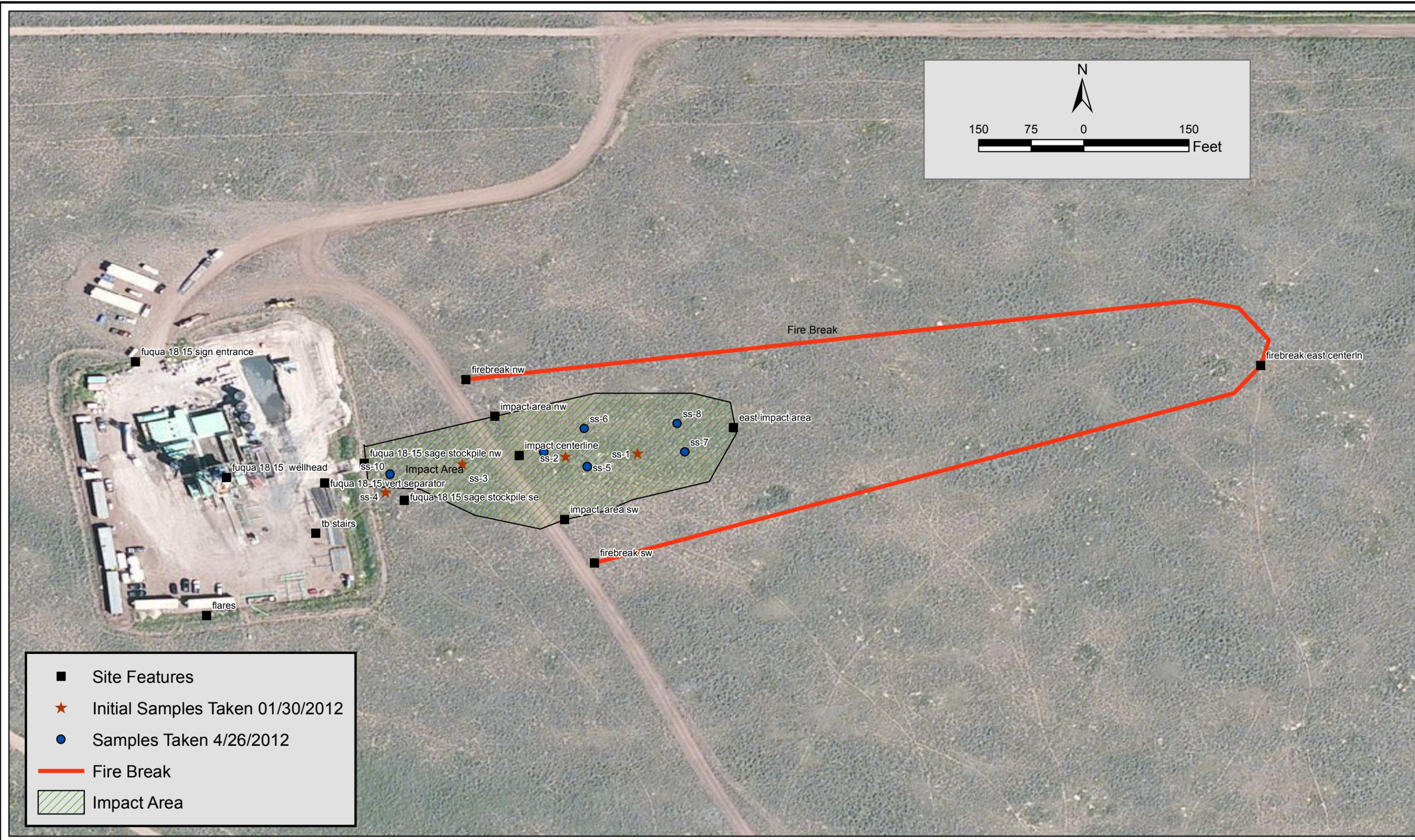
Base Map is Adapted from the Rand USGS
7.5-Minute Topographic Map

FIGURE 1
Fuqua 18-15 Well Pad
General Site Location Map

SW ¼ SE ¼ Section 18, T6N, R78W
Jackson County, Colorado

Revision Date:	11/13/12
Revision Number	
Revised by:	JWH
Approved by:	
Project Number:	012-0225
Scale:	1" = 2000'





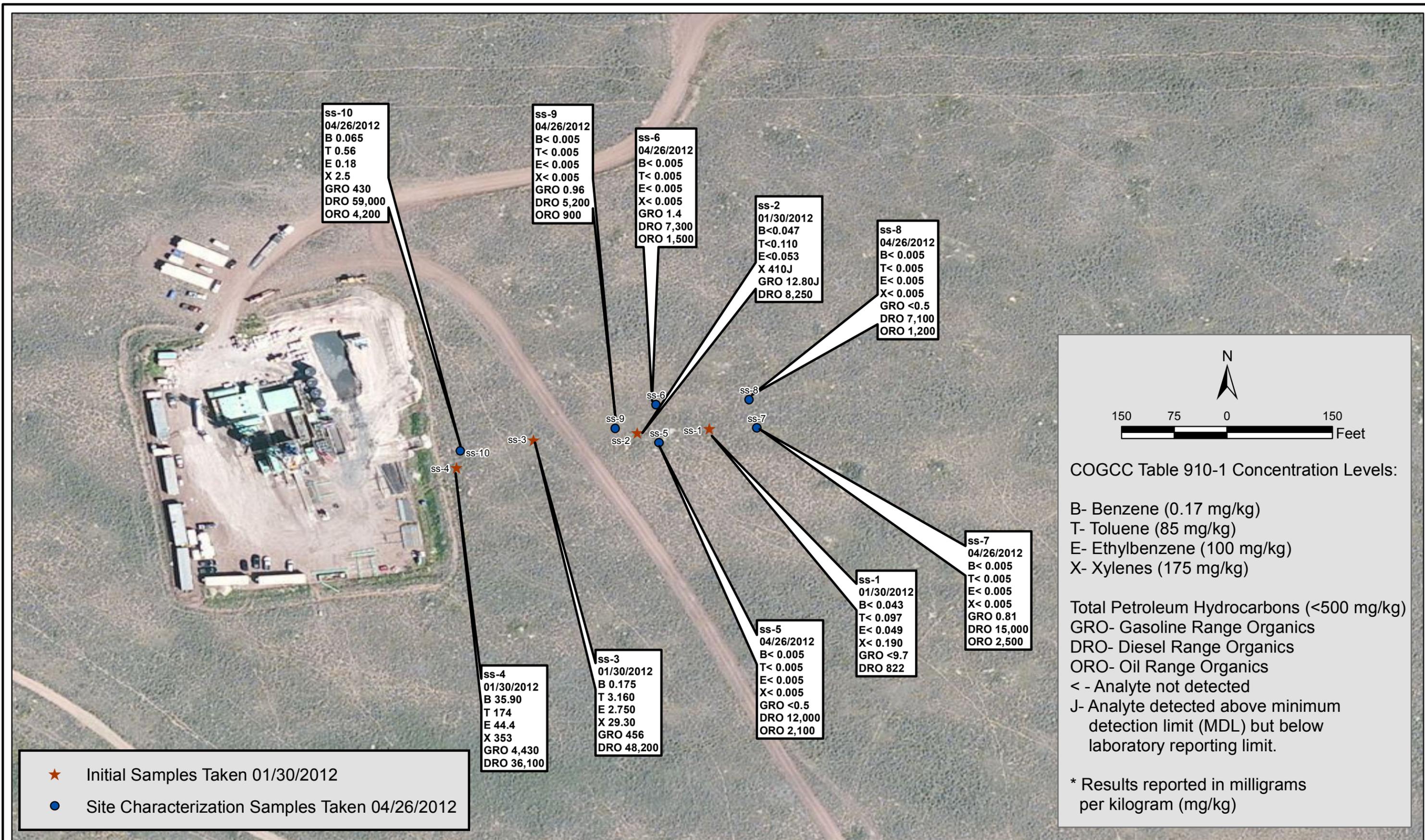
■	Site Features
★	Initial Samples Taken 01/30/2012
●	Samples Taken 4/26/2012
—	Fire Break
▨	Impact Area

PROJECT: 012-0225
 DRAWN BY: hd
 DATE: 11/14/2012

Site Map Showing Impact Area and Site Characterization Soil Sample Locations
 Fuqua 18-15
 Jackson County, Colorado

OLSSON ASSOCIATES
 1111 Lincoln Mall, Suite 111
 P.O. Box 94608
 Lincoln, NE 68501-4608
 TEL: 402.474.6311
 FAX: 402.474.5160
 www.oaconsulting.com

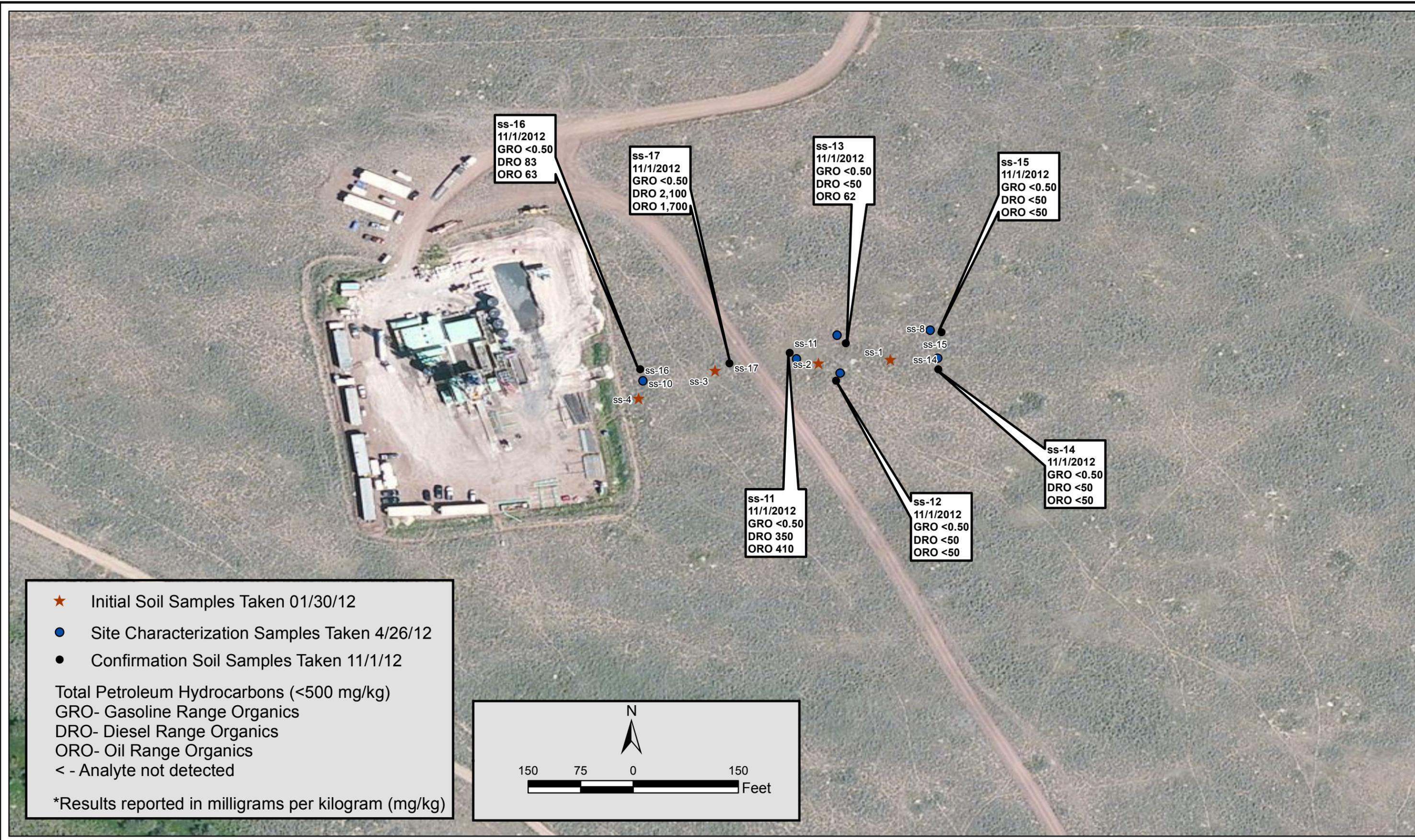
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PROJECT: 012-0225
 DRAWN BY: hd
 DATE: 5/14/2012

Site Characterization Soil Analytical Results
 Fuqua 18-15
 Jackson County, Colorado

F:\Projects\20050154\gis\maps.mxd



F:/Projects/20050154/gis/maps.mxd

PROJECT: 012-0225
DRAWN BY: hd
DATE: 11/14/2012

Confirmation Soil Sample Results
 Fuqua 18-15
 Jackson County, Colorado

OLSSON ASSOCIATES

1111 Lincoln Mall, Suite 111
 P.O. Box 94608
 Lincoln, NE 68501-4608

TEL: 402.474.6311
 FAX: 402.474.5160
 www.oaconsulting.com

ATTACHMENT A
COGCC FORM 27 Approval
EARTHSMART ESHC
HYDROCARBON CLEANER

State of Colorado
Oil and Gas Conservation Commission



FOR OGCC USE ONLY

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303)894-2100 Fax:(303)894-2109

SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

OGCC Employee:
 Spill Complaint
 Inspection NOAV
 Tracking No: 2222753

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

Spill or Release Plug & Abandon Central Facility Closure Site/Facility Closure Other (describe): _____

OGCC Operator Number: <u>10232</u>	Contact Name and Telephone: <u>Wayne Bankert</u>
Name of Operator: <u>Laramie Energy II, LLC</u>	No: <u>970.812.5310</u>
Address: <u>1512 Larimer Street, Suite 1000</u>	Fax: <u>970.683.5594</u>
City: <u>Denver</u> State: <u>CO</u> Zip: <u>80202</u>	

API Number: <u>05-057-06483</u>	County: <u>Jackson</u>
Facility Name: <u>Fuqua 18-15 Well Pad</u>	Facility Number: <u>NA location = 324766</u>
Well Name: <u>Fuqua #19-02-10-1H</u>	Well Number: <u>Fuqua #19-02-10-1H</u>
Location: (QtrQtr, Sec, Twp, Rng, Meridian): <u>SW SE Sec 18 T6N R78W 6 P.M.</u> Latitude: <u>40.48465</u> Longitude: <u>-106.1847</u>	

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): condensate/crude oil

Site Conditions: Is location within a sensitive area (according to Rule 901e)? Y N If yes, attach evaluation.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Rangeland - sage brush pasture

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: _____

Potential receptors (water wells within 1/4 mi, surface waters, etc.): _____

Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):	Extent of Impact:	How Determined:
<input checked="" type="checkbox"/> Soils	<u>Approximately 200 ft by 450 ft</u>	<u>Visually, Samples, Tape Measure/GPS</u>
<input checked="" type="checkbox"/> Vegetation	<u>Approximately 200 ft by 450 ft</u>	<u>Visually, Samples, Tape Measure/GPS</u>
<input type="checkbox"/> Groundwater	_____	_____
<input type="checkbox"/> Surface Water	_____	_____

REMEDIATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):

Laramie Energy II scraped up approximately 20 cubic yards of impacted sage brush and soils in containment near the vertical separator where the release occurred. The original plan was to burn the impacted areas, scarify the soil, and re-seed with native grasses and sage brush. A fire break was cut around the perimeter of the impact area in preparation for a controlled burn. However, a county wide burn ban was implemented two days before the controlled burn was to take place.

Describe how source is to be removed:

The release area will be fenced with 3-strand barbwire to prevent cattle and wildlife from entering the impact area. Laramie Energy II will hire a contractor to spray surfactant and nutrients over the impact area using a tractor and a boom. Additional soil samples will be collected 3 months after the application. If the impacted soils have not met the COGCC Table 910-1 standards and the burn ban is lifted, burning the impacted vegetation and/or a second application will be evaluated following receipt of soil analytical results.

Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:

The impacted soils and vegetation, primarily sage brush, will be spread out and shredded for use as a mulch in the fire break areas. The materials will be driven over with heavy equipment to break the sage brush into smaller pieces to increase surface area and mixed with the impacted soils so that the hydrocarbons will break down more readily. The impacted materials will be treated with a surfactant, water, and nutrient mixture to enhance bioremediation of the impacted materials by native soil microbes. The impact area will be re-sampled within 3 months to assess progress.



Tracking Number: 222753
Name of Operator: _____
OGCC Operator No: _____
Received Date: _____
Well Name & No: _____
Facility Name & No: 324766

Page 2
REMEDIATION WORKPLAN (Cont.)

OGCC Employee: _____

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

Based on a review of DWR records for permitted water wells in the area there are no water wells located within Section 18. One permitted well was identified in Section 20, with a total depth listed at 100 feet. There are no permitted water wells in the immediate downgradient direction (NW) of the Fuqua 18-15 well pad, and the release was directed to the east, or away from the closest surface water (Monroe-Ottawa Ditches) and the Illinois River. Groundwater is not expected to be impacted based on the reported groundwater depth (50 ft to 100 ft) and nature of the release.

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.

Surface soil samples were collected on 04/26/2012 from the spill area to assess current site conditions and to define the nature and extent of the impacted area. The condensate/crude oil impacts are surficial since the release was from the top of a vertical separator. New grasses were observed to have germinated and cacti and forbs were observed flowering within the impact area at the time of the sampling. Using a surfactant to break down the paraffins on the vegetation and addition of nutrient to enhance biodegradation in the soil has advantages over burning since the existing vegetation is maintained and the area will recover faster than if it were brush hogged, disked, and re-seeded. Clearing the area would potentially provide an opportunity for noxious weeds to become established in the impacted area. Grading and recontouring will not be necessary, and compaction is not an issue. Samples will be collected six months after treatment to assess progress.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? Y N If yes, describe:

See attached map and analytical results.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

The E&P waste is to be landtreated and disposed onsite. The waste consists primarily of diesel range organics and oil range organics and will be treated with a surfactant and nutrient solution to help break down the heavier range hydrocarbons. Native soil microbes will further break down the hydrocarbons. Impacted vegetation and soils will be shredded and used as mulch to promote revegetation of the fire break. If subsequent analytical results indicate that petroleum hydrocarbon concentrations still do not meet the COGCC Table 910-1 standard of 500 mg/kg, then a second application of surfactant and nutrients or a controlled burn may be considered once the Jackson County fire ban is lifted.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 01/30/2012 Date Site Investigation Completed: 04/26/2012 Date Remediation Plan Submitted: _____
Remediation Start Date: _____ Anticipated Completion Date: _____ Actual Completion Date: _____

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name: Wayne P. Bankert Signed: _____
Title: Senior Regulatory and Environmental Coordinator Date: _____

OGCC Approved: [Signature] Title: Env. Supervisor Date: 5/5/12

Provide schedule for nutrient application and sampling.



ESHC – HYDROCARBON CLEANER / DEGREASER

ESHC is an environmentally safe, non-hazardous, biodegradable formulation for use in removing fresh and aged petroleum hydrocarbons from both hard and porous surfaces. When used as directed **ESHC** will effectively clean, liquefy and degrade a wide range of hydrocarbons including gasoline, diesel, motor oil, crude oil, glycol, hydraulic fluid, benzene, toluene, ethyl benzene, xylene, etc. **ESHC** is safe for use on gravel, sand, railroad ballast, concrete, brick, asphalt, metal, rubber, plastics, porcelain, wood, textiles, etc. Our Earth Smart Hydrocarbon Cleaner does NOT contain acids, caustics, chemicals, petroleum distillates or VOC's and is D-Limonene free. In addition, **ESHC** is environmentally friendly and leaves no residue.

BENEFITS OF ESHC:

- Biodegradable
- Non Toxic - Non Hazardous
- Does not produce fumes
- Non Flammable
- Non Combustible
- Non Corrosive - Contains corrosion inhibitors
- Does not contain VOC's
- Environmentally safe alternative to solvent based cleaners
- Contains no petroleum distillates
- Phosphate free
- Non abrasive
- Deep cleans surfaces – Provides visible results in minutes
- Fast drying
- D-Limonene free
- Leaves no residue
- Enhances the natural degradation processes
- Eliminates unsightly areas
- Reduces potential liability
- Lowers disposal costs
- Certified for use in Southern California
- Can be used in concentrated form or diluted form

ESHC IS SAFE FOR USE ON ANY SURFACE THAT IS COMPATABLE WITH WATER

TYPICAL APPLICATIONS:

- New and aged hydrocarbon spills
- Oil field equipment
- Railroad ballast
- Locomotives
- Floors, sidewalks, parking lots, storage tanks, filling stations, docks, oil platforms, etc.
- Electric transformers, sumps, machinery, aircraft, rolling stock, etc.

VARIOUS APPLICATION TECHNIQUES:

- Spraying
- Pouring
- Pressure Washing
- Ultrasonic Cleaning
- Parts Washer
- Dipping
- Soaking
- Brushing
- Sponging
- Wiping
- Flooding

****ESH**C does not vaporize. It is not odorous and does not damage human tissue. It is biodegradable and is NOT DOT regulated. **ESH**C constituents are NOT CERCLA hazardous (40 CFR 302.4), or SARA toxic (40 CFR 372, subpart D) and unused **ESH**C would not be considered a hazardous waste (40 CFR 261, subparts C, D, Appendix VIII).

APPLICATIONS TO HARD SURFACES (concrete, steel, cast, aluminum, wood, glass, etc.):

1. Dilute at a rate of 1:10 – 1:20 in water and apply to the affected area
2. Allow sufficient contact time (typically, 10 – 20 minutes) for the product to loosen or dissolve deposits. Do not allow to dry - Keep the area moist by misting with diluted solution or water. For aged stains, agitate, using a fibre pad or brush. Typically, the longer the contact time, the less agitation will be required
3. Rinse or flush with water. Where rinsing is not possible, wipe with wet cloth or sponge

ADDITIONAL DILUTION RATES:

Parts Washers - Dilute 1:20

Pressure Washers - Dilute 1:50 to 1:100

Ultrasonic Cleaners - Dilute 1:50

Note: WARMER TEMPERATURES WILL REDUCE CLEANING TIME

SAFETY:

ESHC is produced in accordance with NOSB (National Organic Standards Board) guidelines. The materials used in the production process are derived from naturally occurring and sustainable sources and are consistent with organic principals and the National List of Allowed Substances. **ESH**C does NOT contain synthetic chemicals, animal components, and animal by products, manure or manure by-products. **ESH**C is environmentally safe and is not harmful to animals, plants and humans.

COMPLIANCE:

Fully complies with EPA Toxic Substance Control Act (TSCA) and the rules, orders and regulations promulgated there under including:

- a) Sections 4, 5, 6 & 7; Title 40 Chapter 1, 707.20 thru 707.75;
- b) 40 CFR Sections 704.3. 710.2(e) and 720.3(c); and
- c) Sections 5 and 13, reference 42FR64583
- d) Does not contain marine pollutants as defined in 49 CFR 171.8.

STORAGE & HANDLING:

Store in a cool location away from direct sunlight - No special handling required

PACKAGING:

2 Litre Jug

20 Litre (5 gallon) HDPE Pail

205 Litre (45 gallon) Barrel

1000 Litre Tote



MATERIAL SAFETY DATA SHEET

ESHC – Hydrocarbon Cleaner

I. GENERAL SUPPLIER INFORMATION

Product Identifier: ESHC – Hydrocarbon Cleaner
Product Code: 6618
Application: Hydrocarbon Degradar / Hard Surface Cleaner
IHC: 3402.20.51.00
Manufacturer: Earth Smart Solutions
Address: 120 – 60 Industry Way S.E., Calgary, AB., CA. T3S 0A2
Toll Free: 1-866-444-7174
Fax: 403-264-9606
Email: info@earth-smart-solutions.com

II. HAZARDOUS INGREDIENTS

Hazardous Components: None – GRAS (Generally recognized as safe)

III. PHYSICAL / CHEMICAL DATA

Form: Liquid
Color: Blue
Odor: Neutral
Bulk Density: 0.6 - 0.8 gr/cc
Solubility: 99.9%
pH: 6.5 – 7.5
Nutrients: Bio-Stimulants, Micronutrients
Specific Gravity: 1.0

IV. FIRE & EXPLOSION DATA

Flash Point: N/A Non Flammable (Method ASTM D93)
Special Fire Fighting Procedures: None
Extinguishing Media: N/A
Sensitive to mechanical impact: No
Sensitive to static discharge: No



MATERIAL SAFETY DATA SHEET

ESHC – Hydrocarbon Cleaner

V. REACTIVITY DATA

Stability:	Stable
Conditions to Avoid:	Accumulation of product in confined area.
Hazardous Byproducts:	None
Hazardous Polymerization:	Will not occur.
Incompatibility:	Normally un-reactive; however, avoid strong bases at high temperatures, strong acids, strong oxidizing agents and materials reactive with hydroxyl compounds.

VI. HEALTH HAZARDS

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: None known

CARCINOGEN: No – IARC, NTP, OSHA

Eye Contact:

General Symptoms: May cause moderate irritation excess blinking and tear production

First Aid: Flush with water - Seek medical attention as required

Recommended Precautions: Safety goggles - Avoid creating mist in confined areas

Skin Contact:

General Symptoms: May cause irritation if a person has a history of dermal allergic reaction

First Aid: Wash with soap and water

Recommended Precautions: Limit exposure

Ingestion:

General Symptoms: Considered non toxic but may lead to nausea or diarrhea

First Aid: Drink water or milk - do not induce vomiting - Seek medical attention as required

Recommended Precautions: Store in safe place - **KEEP OUT OF REACH OF CHILDREN**

Inhalation:

General Symptoms: May causes irritation

First Aid: Calm the individual - provide fresh air - Seek medical attention as required



MATERIAL SAFETY DATA SHEET

ESHC – Hydrocarbon Cleaner

Recommended Precautions: Use approved respiratory mask in confined areas. Avoid creating mist in confined areas. Provide ventilation when creating mist in confined areas.

General Precautions: Use common sense procedures - Wash hands after use

VII. STORAGE AND HANDLING

Storage: Store at temperatures between 41 degrees F and 104 degrees F (5 C and 4C).
Close containers after use.

Handling: No special handling required.

VIII. CONTROL MEASURES

Respiratory Protection: When creating mist in confined areas

Ventilation: Mechanical (General)

Gloves: As required

Eye Protection: As required

Hygienic Practices: Wash hands after handling product

Waste Disposal: Small spills can be washed away with large amounts of water. Large spills, if contained, can be returned to container. Check with regulatory agencies before disposing of large quantities.

IX. COMPLIANCE

Fully complies with EPA Toxic Substance Control Act (TSCA) and the rules, orders and regulations promulgated there under including:

- a) Sections 4, 5, 6 & 7; Title 40 Chapter 1, 707.20 thru 707.75;
- b) 40 CFR Sections 704.3, 710.2(e) and 720.3(c); and
- c) Sections 5 and 13, reference 42FR64583
- d) Does not contain marine pollutants as defined in 49 CFR 171.8.



MATERIAL SAFETY DATA SHEET

ESHC – Hydrocarbon Cleaner

X. BIOLOGICAL HAZARD DATA

Product has been shown to be free of Salmonella and Shigella using standard procedures outlined by AOAC and the USDA.

XI. PREPARATION DATA

Information Sources:	Suppliers MSDSs, DSL, TSCA, EPA, IARC, NTP, OSHA.
Preparation Date:	March 12, 2007
Last Revised:	2008.01.21

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ATTACHMENT B
SITE PHOTOGRAPHS



Subject: A John Deere 741 tractor with a 150-gallon capacity polytank and a sprayer boom was used to apply the EarthSmart hydrocarbon cleaner over the impacted area. The vertical separator is shown at the right hand side of the photo. A three-strand wire fence had been constructed to keep cattle out of the area.

Date: June 26, 2012

View: Southwest



Subject: The concentrated Earth Smart hydrocarbon cleaner was delivered in 5-gallon containers. The area was treated twice using a ratio of one 5-gallon bucket of the concentrate to approximately 100 gallons of water.

Date: June 26, 2012

View: East



Subject: Stained soil and vegetation had been stockpile on the east side of the well pad near an access road.

Date: June 26, 2012

View: East



Subject: Photograph shows the treatment in progress near the stockpile on the south side of the release area. A fire break had been cleared around the release area since the original treatment plan was to burn the impacted vegetation. However, Jackson County implemented a fire ban due to a lack of precipitation and high fire danger.

Date: June 26, 2012

View: South



Subject: An orange pin flag marks the approximate centerline of the release area. Impacted brush and new vegetation growth can be seen in the photograph. The EarthSmarth hydrocarbon cleaner was used to aid in breaking down and reducing hydrocarbon concentrations.

Date: June 26, 2012

View: South



Subject: Photograph shows treatment of the south side of the release area and new growth of grasses and brush.

Date: June 26, 2012

View: East



Subject: Stained soils were observed in the release area with the heaviest impact closest to the well pad. However, new vegetation growth was also observed.

Date: June 26, 2012

View: N/A



Subject: Photograph shows new vegetation growth in the vicinity of one of the April 2012 site characterization soil sample locations marked with flagging tape near the center of the photograph.

Date: June 26, 2012

View: N/A



Subject: New vegetation growth and flowering plants were observed within the release area.

Date: June 26, 2012

View: N/A



Subject: Water was obtained from a pond on the Fuqua Ranch and brought to the site in a 1,000-gallon capacity tank. The 150-gallon capacity polytank on the tractor was filled using one 5-gallon bucket and approximately 100-gallons of water for each mixture. The area was treated using two applications of the EarthSmart hydrocarbon cleaner solution.

Date: June 26, 2012

View: West



Subject: Photograph shows treatment of the release impact area.

Date: June 26, 2012

View: Northwest



Subject: Laramie Energy II – Fuqua 18-15 photograph shows the January 29, 2012 separator release area and vegetation recovery and residual staining in September 2012 from the fire break and access road near the well pad.

Date: September 13, 2012

View: East



Subject: Laramie Energy II – Fuqua 18-15 separator release site photograph shows the release area with residual staining and vegetation recovery.

Date: September 13, 2012

View: South-Southeast



Subject: Laramie Energy II – Fuqua 18-15 separator release site photograph shows pin flag marking the approximate center line of the release following the June 26, 2012 biosurfactant treatment solution.

Date: September 13, 2012

View: East



Subject: Laramie Energy II – Fuqua 18-15 Well pad January 29, 2012 release area showing the vertical separator in the upper right hand corner of the photograph. The area was treated with a water and biosurfactant solution on June 26, 2012.

Date: September 13, 2012

View: Northwest



Subject: Laramie Energy II – Fuqua 18-15 Well pad January 29, 2012 release area showing the Fuqua 18-15 well pad in the background of the photograph.

Date: September 13, 2012

View: West-northwest

ATTACHMENT C
LABORATORY ANALYTICAL RESULTS

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

November 05, 2012

James Hix

Olsson Associates

4690 Table Mountain Drive, Suite 200

Golden, CO 80403

RE: LE Fuqua 18-15

Enclosed are the results of analyses for samples received by Summit Scientific on 11/02/12 08:47. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Joseph J Egry IV

Laboratory Director



Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: LE Fuqua 18-15

Project Number: 012-0225
Project Manager: James Hix

Reported:
11/05/12 14:27

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS11	R211014-01	Soil	11/01/12 10:20	11/02/12 08:47
SS12	R211014-02	Soil	11/01/12 10:35	11/02/12 08:47
SS13	R211014-03	Soil	11/01/12 10:37	11/02/12 08:47
SS14	R211014-04	Soil	11/01/12 10:46	11/02/12 08:47
SS15	R211014-05	Soil	11/01/12 10:50	11/02/12 08:47
SS16	R211014-06	Soil	11/01/12 11:07	11/02/12 08:47
SS17	R211014-07	Soil	11/01/12 11:17	11/02/12 08:47

Summit Scientific

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Olsson Associates
 4690 Table Mountain Drive, Suite 200
 Golden CO, 80403

Project: LE Fuqua 18-15

Project Number: 012-0225
 Project Manager: James Hix

Reported:
 11/05/12 14:27

SS11
R211014-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 11/01/12 10:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (TEPH-DRO)	350	50	mg/kg	1	2110213	11/02/12	11/02/12	8015 Full Carbon Chain	
C28-C36 (TEPH-ORO)	410	50	"	"	"	"	"	"	

Date Sampled: 11/01/12 10:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		91.4 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 11/01/12 10:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Gasoline Range Hydrocarbons	ND	0.500	mg/kg	1	2110212	"	11/02/12	EPA 8260B	

Date Sampled: 11/01/12 10:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		103 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		96.8 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		93.0 %	30-150		"	"	"	"	

Summit Scientific

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Olsson Associates
 4690 Table Mountain Drive, Suite 200
 Golden CO, 80403

Project: LE Fuqua 18-15

Project Number: 012-0225
 Project Manager: James Hix

Reported:
 11/05/12 14:27

SS12
R211014-02 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **11/01/12 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (TEPH-DRO)	ND	50	mg/kg	1	2110213	11/02/12	11/02/12	8015 Full Carbon Chain	
C28-C36 (TEPH-ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **11/01/12 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		81.0 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/01/12 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Gasoline Range Hydrocarbons	ND	0.500	mg/kg	1	2110212	"	11/02/12	EPA 8260B	

Date Sampled: **11/01/12 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		108 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		97.3 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.4 %	30-150		"	"	"	"	

Summit Scientific

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Olsson Associates
 4690 Table Mountain Drive, Suite 200
 Golden CO, 80403

Project: LE Fuqua 18-15

Project Number: 012-0225
 Project Manager: James Hix

Reported:
 11/05/12 14:27

SS13
R211014-03 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **11/01/12 10:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (TEPH-DRO)	ND	50	mg/kg	1	2110213	11/02/12	11/03/12	8015 Full Carbon Chain	
C28-C36 (TEPH-ORO)	62	50	"	"	"	"	"	"	

Date Sampled: **11/01/12 10:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		78.1 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/01/12 10:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Gasoline Range Hydrocarbons	ND	0.500	mg/kg	1	2110212	"	11/03/12	EPA 8260B	

Date Sampled: **11/01/12 10:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		115 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		99.6 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		93.4 %	30-150		"	"	"	"	

Summit Scientific

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Olsson Associates
 4690 Table Mountain Drive, Suite 200
 Golden CO, 80403

Project: LE Fuqua 18-15

Project Number: 012-0225
 Project Manager: James Hix

Reported:
 11/05/12 14:27

SS14
R211014-04 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **11/01/12 10:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (TEPH-DRO)	ND	50	mg/kg	1	2110213	11/02/12	11/03/12	8015 Full Carbon Chain	
C28-C36 (TEPH-ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **11/01/12 10:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		81.2 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/01/12 10:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Gasoline Range Hydrocarbons	ND	0.500	mg/kg	1	2110212	"	11/03/12	EPA 8260B	

Date Sampled: **11/01/12 10:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		114 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		97.4 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		93.2 %	30-150		"	"	"	"	

Summit Scientific

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Olsson Associates
 4690 Table Mountain Drive, Suite 200
 Golden CO, 80403

Project: LE Fuqua 18-15

Project Number: 012-0225
 Project Manager: James Hix

Reported:
 11/05/12 14:27

SS15
R211014-05 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **11/01/12 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (TEPH-DRO)	ND	50	mg/kg	1	2110213	11/02/12	11/03/12	8015 Full Carbon Chain	
C28-C36 (TEPH-ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **11/01/12 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		82.3 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/01/12 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Gasoline Range Hydrocarbons	ND	0.500	mg/kg	1	2110212	"	11/03/12	EPA 8260B	

Date Sampled: **11/01/12 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		111 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		98.7 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.7 %	30-150		"	"	"	"	

Summit Scientific

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Olsson Associates
 4690 Table Mountain Drive, Suite 200
 Golden CO, 80403

Project: LE Fuqua 18-15

Project Number: 012-0225
 Project Manager: James Hix

Reported:
 11/05/12 14:27

SS16
R211014-06 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 11/01/12 11:07

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (TEPH-DRO)	83	50	mg/kg	1	2110213	11/02/12	11/03/12	8015 Full Carbon Chain	
C28-C36 (TEPH-ORO)	63	50	"	"	"	"	"	"	

Date Sampled: 11/01/12 11:07

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		83.5 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 11/01/12 11:07

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Gasoline Range Hydrocarbons	ND	0.500	mg/kg	1	2110212	"	11/03/12	EPA 8260B	

Date Sampled: 11/01/12 11:07

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		111 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		98.9 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		93.7 %	30-150		"	"	"	"	

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 Golden CO, 80403

Project: LE Fuqua 18-15

Project Number: 012-0225
 Project Manager: James Hix

Reported:
 11/05/12 14:27

SS17
R211014-07 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 11/01/12 11:17

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (TEPH-DRO)	2100	50	mg/kg	1	2110213	11/02/12	11/03/12	8015 Full Carbon Chain	
C28-C36 (TEPH-ORO)	1700	50	"	"	"	"	"	"	

Date Sampled: 11/01/12 11:17

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		118 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 11/01/12 11:17

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Gasoline Range Hydrocarbons	ND	0.500	mg/kg	1	2110212	"	11/03/12	EPA 8260B	

Date Sampled: 11/01/12 11:17

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		104 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		98.6 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		92.0 %	30-150		"	"	"	"	

Summit Scientific

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Olsson Associates
 4690 Table Mountain Drive, Suite 200
 Golden CO, 80403

Project: LE Fuqua 18-15

Project Number: 012-0225
 Project Manager: James Hix

Reported:
 11/05/12 14:27

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

Analyte	Result	Reporting		Spike Level	Source		%REC		RPD		Notes
		Limit	Units		Result	%REC	Limits	RPD	Limit		

Batch 2110213 - EPA 3550A

Blank (2110213-BLK1)

Prepared & Analyzed: 11/02/12

C10-C28 (TEPH-DRO)	ND	50	mg/kg								
C28-C36 (TEPH-ORO)	ND	50	"								

LCS (2110213-BS1)

Prepared & Analyzed: 11/02/12

C10-C28 (TEPH-DRO)	465	50	mg/kg	501		92.8	73-134				
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LCS Dup (2110213-BSD1)

Prepared & Analyzed: 11/02/12

C10-C28 (TEPH-DRO)	471	50	mg/kg	501		93.9	73-134	1.22		11	
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Matrix Spike (2110213-MS1)

Source: R211014-01

Prepared & Analyzed: 11/02/12

C10-C28 (TEPH-DRO)	622	50	mg/kg	499	351	54.3	50-148				
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Matrix Spike Dup (2110213-MSD1)

Source: R211014-01

Prepared & Analyzed: 11/02/12

C10-C28 (TEPH-DRO)	666	50	mg/kg	490	351	64.4	50-148	6.91		13	
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Summit Scientific

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Olsson Associates
4690 Table Mountain Drive, Suite 200
Golden CO, 80403

Project: LE Fuqua 18-15
Project Number: 012-0225
Project Manager: James Hix

Reported:
11/05/12 14:27

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source	%REC		RPD		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch 2110212 - EPA 5030 Soil MS

Blank (2110212-BLK1)

Prepared & Analyzed: 11/02/12

Gasoline Range Hydrocarbons	ND	0.500	mg/kg							
Surrogate: 1,2-Dichloroethane-d4	0.0415		"	0.0397		105	30-150			
Surrogate: Toluene-d8	0.0387		"	0.0400		96.8	30-150			
Surrogate: 4-Bromofluorobenzene	0.0389		"	0.0400		97.2	30-150			

LCS (2110212-BS1)

Prepared & Analyzed: 11/02/12

Gasoline Range Hydrocarbons	1.84	0.500	mg/kg				30-150			
Surrogate: 1,2-Dichloroethane-d4	0.0400		"	0.0397		101	30-150			
Surrogate: Toluene-d8	0.0395		"	0.0400		98.7	30-150			
Surrogate: 4-Bromofluorobenzene	0.0362		"	0.0400		90.5	30-150			

LCS Dup (2110212-BSD1)

Prepared & Analyzed: 11/02/12

Gasoline Range Hydrocarbons	1.90	0.500	mg/kg				30-150	3.18	20	
Surrogate: 1,2-Dichloroethane-d4	0.0410		"	0.0397		103	30-150			
Surrogate: Toluene-d8	0.0388		"	0.0400		96.9	30-150			
Surrogate: 4-Bromofluorobenzene	0.0378		"	0.0400		94.5	30-150			

Matrix Spike (2110212-MS1)

Source: R211014-01

Prepared & Analyzed: 11/02/12

Gasoline Range Hydrocarbons	1.95	0.500	mg/kg		ND		30-150			
Surrogate: 1,2-Dichloroethane-d4	0.0406		"	0.0382		106	30-150			
Surrogate: Toluene-d8	0.0379		"	0.0385		98.6	30-150			
Surrogate: 4-Bromofluorobenzene	0.0354		"	0.0385		92.0	30-150			

Matrix Spike Dup (2110212-MSD1)

Source: R211014-01

Prepared & Analyzed: 11/02/12

Gasoline Range Hydrocarbons	1.90	0.500	mg/kg		ND		30-150	2.65	20	
Surrogate: 1,2-Dichloroethane-d4	0.0394		"	0.0377		104	30-150			
Surrogate: Toluene-d8	0.0368		"	0.0380		96.7	30-150			
Surrogate: 4-Bromofluorobenzene	0.0356		"	0.0380		93.6	30-150			

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Olsson Associates
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Golden CO, 80403

Project: LE Fuqua 18-15

Project Number: 012-0225
Project Manager: James Hix

Reported:
11/05/12 14:27

Notes and Definitions

DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit
NR Not Reported
dry Sample results reported on a dry weight basis
RPD Relative Percent Difference

Summit Scientific

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