



October 30, 2015

Mr. Josh Carlisle
Extraction Oil & Gas, LLC
370 17th Street, Suite 5300
Denver, CO 80202

**Re: Skaer #3 Battery
Separator Release Closure (Spill Document 400911039)
Larimer County, Colorado**

Dear Mr. Carlisle:

Apex Companies, LLC (Apex) is pleased to present this letter report summarizing the results of the separator remediation at the above referenced site (herein referred to as facility or site). Activities were completed in accordance with the Colorado Oil & Gas Conservation Commission (COGCC) 900 Series Rules.

The Skaer #3 Battery is located in Section 25 of Township 5 North an Range 69 West. On September 22, 2015, the separator associated with the Skaer #3 Battery was removed from the location. Upon removal, suspect soil was observed beneath the equipment. An earthwork contractor used a trackhoe to excavate stained soils. Apex personnel arrived on site September 23, 2015 to evaluate remaining soils in the excavation for compliance with regulatory standards.

Samples were collected and field screened using a Photoionization Detector (PID) as well as visual and olfactory observation. The soil was then composited and submitted to a lab for analysis of contaminants listed in COGCC Table 910-1.

Analytical results from the September 23 sampling showed elevated Diesel Range Organics (DRO) in the bottom and north side wall. Excavation commenced again on October 13, 2015. Apex personnel provided excavation support with continuous field screening. When PID readings were below 50 parts per million (PPM) and soils no longer had a hydrocarbon odor or visible staining, confirmation samples were again collected.

Table 1 presents summarized laboratory results from excavation samples. A diagram showing the sample locations can be found in **Attachment A** and the laboratory results are included in **Attachment B**

Final analytical results show the excavation bottom and sidewall soils meet COGCC Table 910-1 standards for the organic constituents of concern (TPH, BTEX, PAH). Arsenic exceeds the allowable concentration in Table 910-1, but is within the range of background values for this area. Extraction can request that the background values be considered as an alternative allowable limit to Table 910-1. The inorganic constituents SAR and pH are above allowable levels, however the excavation bottom is over 17 feet below surface and will be well below the agronomic/root zone (three feet) when backfilled, and will have no effect on revegetation efforts.

The final excavation was approximately 70 feet long by 35 feet wide and had depths between seven (7) and 17 feet. An estimated 1350 cubic yards of soil was transported off-site for disposal.

Apex appreciates the opportunity to provide environmental consulting services to Extraction Oil & Gas, LLC. with this project. Should you have any questions or require additional information, please contact me at (970) 263-8679.

Sincerely,
Apex Companies, LLC



Jana Nilsen
Senior Project Manager

Attachments

TABLE 1

Skaer #3 Battery Separator

Lab ID	Sample ID	Depth Below Surface (feet)	Date Sampled	Organic Compounds	DRO (mg/kg)	GRO (mg/kg)	Total TPH (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes, Total (mg/kg)	Acenaphthene (mg/kg)	Anthracene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Benzo(a)pyrene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (mg/kg)	Pyrene (mg/kg)
		Table 910-1 Standards					500	0.17	85	100	175	1,000	1,000	0.22	0.22	2.2	0.022	22	0.022	1,000	1,000	0.22	23	1,000
L790713-01	Skaer3_Separator_Bottom	4.5	23-Sep-15		747	2.16	749.16	ND	ND	ND	0.0229	0.0303	ND	ND	ND	ND	ND	ND	ND	ND	0.076	ND	ND	ND
L794811-02	Skaer3_Separator_Bottom	17	15-Oct-15		254	4.42	259.42	ND	ND	ND	ND													
L790713-02	Skaer3_Separator_N_SW	3	23-Sep-15		503	ND	503	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
L794811-01	Skaer3_Separator_N_SW	6	15-Oct-15		135	1.75	136.75	ND	ND	ND	ND													
L790713-03	Skaer3_Separator_S_SW	3	23-Sep-15		8.49	ND	8.49	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
L795113-01	Skaer3_Separator_S_SW	7	16-Oct-15		5.37	ND	5.37	ND	ND	ND	ND													
L790713-04	Skaer3_Separator_E_SW	3	23-Sep-15		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
L795113-02	Skaer3_Separator_E_SW	7	16-Oct-15		7.07	ND	7.07	ND	ND	ND	ND													
L790713-05	Skaer3_Separator_W_SW	3	23-Sep-15		12	ND	11.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
L795660-01	Skaer3_Separator_W_SW	8	19-Oct-15		292	2.14	294.14	ND	ND	ND	ND													
L787241-02	Background	1	04-Sep-15																					

Lab ID	Sample ID	Depth Below Surface (feet)	Date Sampled	Inorganics	Electrical Conductivity (mmhos/cm)	Sodium Adsorption Ratio (unitless)	pH (unitless)	Metals	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium, Hexavalent (mg/kg)	Chromium, Trivalent (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Zinc (mg/kg)
		Table 910-1 Standards			<4 or 2 x background	<12	6-9		0.39	15,000	70	23	120,000		3,100	400	23	1,600	390	390	23,000
L790713-01	Skaer3_Separator_Bottom	4.5	23-Sep-15		1220	7.46	8.27		3.62	141	ND	ND	20.0	20.0	10.5	11.8	ND	16.3	ND	ND	56.0
L794811-02	Skaer3_Separator_Bottom	17	15-Oct-15																		
L790713-02	Skaer3_Separator_N_SW	3	23-Sep-15		1080	12.2	8.9		3.38	151	ND	ND	18.8	18.8	10.1	10.8	ND	14.0	ND	ND	48.7
L794811-01	Skaer3_Separator_N_SW	6	15-Oct-15																		
L790713-03	Skaer3_Separator_S_SW	3	23-Sep-15		483	6.84	9.08		3.66	125	ND	ND	18.9	18.9	11.1	11.5	ND	17.3	ND	ND	56.0
L795113-01	Skaer3_Separator_S_SW	7	16-Oct-15																		
L790713-04	Skaer3_Separator_E_SW	3	23-Sep-15		690	1.42	8.56		4.17	201	ND	ND	20.8	20.8	12.6	12.9	MD	18.7	ND	ND	60.0
L795113-02	Skaer3_Separator_E_SW	7	16-Oct-15																		
L790713-05	Skaer3_Separator_W_SW	3	23-Sep-15		3080	40	9.05		4.32	576	ND	ND	22.3	22.3	12.9	12.4	0.02	18.6	ND	ND	58.6
L795660-01	Skaer3_Separator_W_SW	8	19-Oct-15																		
L787241-02	Background	1	04-Sep-15		114	0.0739	7.53		3.31												

ATTACHMENT 1

Sampling Location Diagrams

ATTACHMENT 2

Laboratory Analytical Reports