



**REMEDIATION WORK PLAN  
Land Farming**

Property:

**FAIR OIL, LTD.  
Parakeet 29 Federal #1  
Eddy County, New Mexico  
Unit Letter "I", Section 29, Township 19 South, Range 27 East  
Latitude 32.62852, Longitude -104.29493  
2RP-3897**

December 2016

Prepared for:

**Fair Oil, LTD.**  
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### **1.0 INTRODUCTION**

#### **1.1 Site Description & Background**

American Safety Services Inc. (ASSI) has prepared this Remediation Work Plan for the Fair Oil, LTD. (Fair Oil) Parakeet 29 Federal #1 (referred to hereinafter as the "Site" or "subject Site"). This Remediation Work Plan is based upon field documentation and the interpretation of analytical data previously collected by ASSI.

The Parakeet 29 Federal #1 is located in Unit Letter I, Section 29, Township 19 South, Range 27 East, Eddy County, New Mexico (GPS 32.62852, -104.29493). Fair Oil has acquired this well location and associated equipment.

Investigative actions were conducted by ASSI in accordance with New Mexico Energy, Minerals, and Natural Resources Department (EMNRD), Oil Conservation Division (NMOCD) rules (*NMAC 19.15.29 Release Notification*) and the NMOCD *Guidelines for Remediation of Leaks, Spills and Releases* as guidance.

#### **1.2 Project Objective**

The objective of this Remediation Work Plan is to present documentation of the activities that were performed to date and to submit an appropriate and effective means to remediate the Site.

#### **1.3 Standard of Care**

ASSI's services are performed in accordance with standards provided by a firm rendering the same or similar services in the area during the same time period. ASSI makes no warranties, express or implied, as to the services performed hereunder. Additionally, ASSI does not warranty the work of third parties supplying information used in the report (e.g. laboratories, regulatory agencies, or other third parties). This scope of services will be performed in accordance with the scope of work agreed with the client.

## 1.4 Reliance

This report has been prepared for the exclusive use of Fair Oil, and any authorization for use or reliance by any other party (except a governmental entity having jurisdiction over the Site) is prohibited without the express written authorization of Fair Oil and ASSI. Any unauthorized distribution or reuse is at the client's sole risk. Notwithstanding the foregoing, reliance by authorized parties will be subject to the terms, conditions and limitations stated in the proposal, the report, and ASSI's Agreement. The limitation of liability defined in the agreement is the aggregate limit of ASSI's liability to the client.

## 2.0 SITE RANKING & PROPOSED REMEDIAL ACTION GOALS

The Site is subject to regulatory oversight by the NMOCD. To address activities related to releases, the NMOCD utilizes the *Guidelines for Remediation of Leaks, Spills and Releases* as guidance, in addition to the NMOCD rules, specifically NMAC 19.15.29 *Release Notification*. These documents establish investigation and abatement action requirements for sites subject to reporting and/or corrective action.

In accordance with the NMOCD's *Guidelines for Remediation of Leaks, Spills and Releases*, ASSI utilized the general site characteristics to determine the appropriate "ranking" for the Site. The ranking criteria and associated scoring are provided in the table below:

Ranking Criteria			Ranking Score
Depth to Groundwater	<50 feet	20	10
	50 to 99 feet	10	
	>100 feet	0	
Wellhead Protection Area, <1,000 feet from a water source, or; <200 feet from private domestic water source.	Yes	20	0
	No	0	
Distance to Surface Water Body	<200 feet	20	0
	200 to 1,000 feet	10	
	>1,000 feet	0	
Total Ranking Score			10

Based on ASSI's evaluation of the scoring criteria, the Site would have a Total Ranking Score of 10. This ranking is based on the following:

- The depth to the initial groundwater-bearing zone is 50 to 99 feet at the Site.
- The impacted area is greater than 200 feet from a private domestic water source.
- Distance to the nearest surface water body is greater than 1,000 ft.

Based on a Total Ranking Score of 10, cleanup goals for soils remaining in place include: 10 milligrams per kilogram (mg/Kg) for Benzene, 50 mg/Kg for Total Benzene, Toluene, Ethylbenzene and Xylene (BTEX), 1,000 mg/Kg for Total Petroleum Hydrocarbons (TPH) and 250 mg/Kg for Chloride.

### **3.0 INITIAL RESPONSE & TRENCHING ACTIVITIES**

#### **3.1 Initial Response**

On September 21, 2016, ASSI personnel performed a site inspection at the Fair Oil Parakeet Fed 29 #1 facility. The site inspection was in response to a release directly to the ground of one hundred-fifty (150) barrels (bbls) of crude oil. None of the fluids were recovered. The release impacted approximately five thousand and sixty (5060) square feet of production pad and adjacent pasture area.

#### **3.2 Trenching Activities**

On September 26, 2016 excavation activities were conducted by ASSI using mechanical means (track hoe). Mr. Thomas Franklin, an ASSI environmental professional, was present to document on-site activities (written and photographic). Two (2) trenches, excavated each to a depth of six (6) feet below ground surface (bgs), were completed. Discrete samples were collected from both trenches at the following depths 1', 2', 3', 4', and 6' bgs from the bottom of the excavation during excavation activities. Collected samples were field screened for Chloride to ensure vertical delineation. While field screening for Chloride, manual titrations were completed. Bucket refusal was encountered at a depth of six (6) feet bgs thus preventing further excavation.

##### **3.2.1 Trenching Confirmation Soil Sampling Program**

Ten (10) samples were collected, five each from Trench 1 and Trench 2 during excavation activities. These samples were collected by ASSI personnel and were analyzed for BTEX, TPH and Chloride. The results of the confirmation samples were compared to the NMOCD *Guidelines for Remediation of Leaks, Spills and Releases* (Section VI A. Contaminated Soils). Analytical results show BTEX, TPH, and Chloride exceedances exist above the NMOCD clean-up goals as discussed in Section 2.0 at both trench locations. At Trench 1 Total BTEX concentration exceedances range between 101.74 and 109.68 mg/Kg from 3' to 4' bgs, TPH exceedances range between 1,170 and 13,100 mg/Kg from 1' to 4' bgs, and Chloride has a single exceedance of 2,120 mg/Kg at 1' bgs. At Trench 2 Total BTEX concentration exceedances range between 94.8 and 189.27 mg/Kg from 2' to 3' bgs, and TPH concentration exceedances ranging between 1,550 and 19,200 mg/Kg occur between 1' and 4' bgs.

### **4.0 LABORATORY ANALYTICAL METHODS**

The samples were analyzed for TPH GRO/DRO utilizing EPA method SW-846 8015, BTEX using EPA method SW-846 8021B and chlorides utilizing EPA method SW-846 300.1.

Soil samples were collected and placed in laboratory prepared glassware, placed on ice in a cooler. The sample coolers and completed Chain-of-Custody forms were relinquished to Permian Basin Environmental Lab, LP. in Midland, Texas for normal turn-around time.

## **5.0 REMEDIATION WORK PLAN**

Based upon the data collected and the work completed by ASSI, the constituents of concern were vertically delineated. This delineation indicates an existing TPH problem. Furthermore, the delineation shows Chloride as not being of concern.

Fair Oil and ASSI propose to excavate the top six (6) feet of material, stockpile the material onsite (i.e., treatment cells), and subsequently landfarm.

During excavation activities discrete sidewall sampling will be performed at the desecration of the NMOCD for horizontal delineation purposes. Sampling intervals will be 30 to 50 linear feet or what is deemed appropriate.

Landfarming is an ex-situ waste treatment process that is performed in the upper soil zone or in (bio-treatment cells). Impacted soil material will be transported to the landfarming location and placed in designated areas onsite. Applicability of this technique has been used for many years in the management and disposal of drill cuttings, oily sludge, and other petroleum wastes. The equipment employed in landfarming is typical of that used in agricultural operations. Once impacted material is in place, activities to cultivate (blend) using mechanical means will allow the mixture to aerate which will enhance microbial degradation of hazardous compounds present in the impacted material to begin. Over a short period of time concentration levels that were above remediation guidelines will decrease to level within remediation guidelines due to the aeration processes.

Each of the estimated twenty-four (24) — quadrants (treatment cells) will have an approximate capacity of 50 cubic yards (yd<sup>3</sup>). Impacted material excavated during the horizontal delineation activities is estimated to be approximately one thousand two hundred (1,200 yd<sup>3</sup>). Twenty-four (24) 5-point composite samples of material, one from each of the landfarm quadrants, will be collected. Composite sample collection will be completed in stages subsequent to both appropriate area and size availability to landfarm.

The composite samples will be comprised of material from five (5) sample points within each landfarm quadrant. Auger holes will be installed with a stainless steel hand auger. Samples will be collected of stockpiled landfarmed material. Samples will be submitted for laboratory analysis, as discussed in Section 2.0, under proper Chain-of-Custody. Samples will be relinquished to Permian Basin Environmental Lab, LP. in Midland, Texas who will perform the laboratory analysis and subsequently issue an analytical report.

Backfilling operations will utilize the material produced by the onsite excavation activities that were landfarmed. Material will be placed into cuts and fills then contoured (graded) by mechanical means to match the surrounding land surface grade.