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INFORMATION ONLY

October 26, 2015

#5B23439-BG6

NMOCD District I
French
Hobbs, NM

SUBJECT: FINAL CLOSURE REPORT FOR INCIDENT 1RP-3771 RED HILLS WEST SWD #001, LEA COUNTY, NEW MEXICO

Dear Ms. Jones:

Souder Miller & Associates is pleased to submit the attached Final Closure Report of the remediation of the release site located on the Red Hills West SWD #001 in Eddy County, New Mexico. The purpose of the Final Report is to obtain approval from the New Mexico Oil Conservation Division (NMOCD) for the closure of the release that occurred on New Mexico State Land Office property on July 27, 2015.

Souder, Miller & Associates (SMA) responded at the request of Mewbourne Oil Company (MOC) to assess and delineate the release of production fluids associated with the Red Hills West SWD #001 well location. The release was initially reported to NMOCD by Mewbourne Oil Company on July 27, 2015 and was a result of damage caused by a lightning strike. The table below summarizes information regarding the release. Results of the assessment, delineation, and remedial activities follow in the attached closure report.

Table 1: Release information and Site Ranking

Name	Red Hills West SWD #001				
Location	Incident Number	API Number	Section, Township, Range		
	1RP-3771	30-025-40162	(Unit P)	Section 16	T 26S, R 32E NMPM
Estimated Date of Release	27-July-15				
Date Reported to NMOCD	27-July-15				
Reported by	Zach Thomas, MOC				
Land Owner	New Mexico State Land Office				
Reported To	NM Oil Conservation Division (NMOCD)				
Source of Release	Lightning Strike Damage				
Released Material	Produced Water				
Released Volume	1900 bbls Produced Water				
Recovered Volume	1760 bbls Produced Water				
Net Release	140 bbls Produced Water				
Nearest Waterway	15 miles northeast of the Pecos River				
Depth to Groundwater	Estimated to be greater than 100 feet				

Nearest Domestic Water Source	Greater than 1,000 feet
NMOCD Ranking	0
SMA Response Dates	Initial: September 28, 2015 Mitigation Activities: August 4, 2015
Subcontractors	
Disposal Facility	
Estimated Yd^3 Contaminated Soil Excavated and Disposed	

A copy of the C-141 final is located in Appendix B. For questions or comments pertaining to the release or the attached Closure Report, please feel free to contact either of us.

Submitted by:

SOUDER, MILLER & ASSOCIATES

J. Austin Weyant

Austin Weyant
Project Scientist

Reviewed by:

Cynthia Gray, CHMM
Senior Scientist

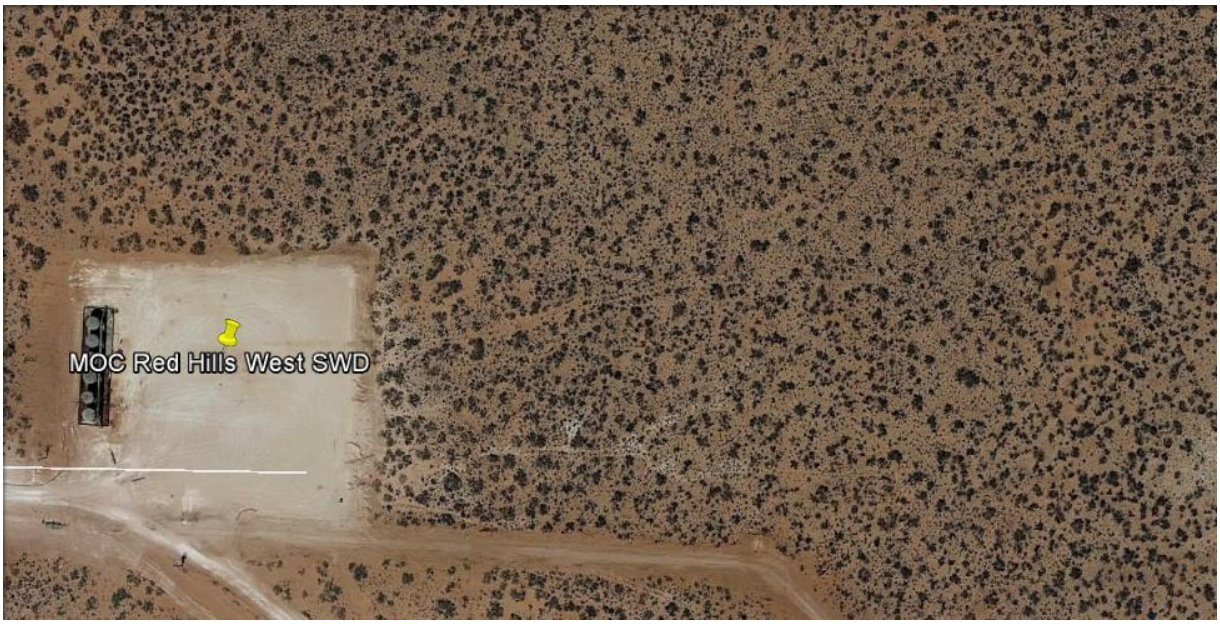
FINAL CLOSURE REPORT FOR INCIDENT 1RP-3771

MEWBOURNE OIL COMPANY

RED HILLS WEST SWD #001

API# 30-025-40162

SECTION 16, T26S R32E, NMPM
LEA COUNTY, NM



Prepared for:

Mewbourne Oil Company
P.O. Box 7698
Tyler, TX 75711

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October 26, 2015
SMA Reference
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1.0 Introduction

On behalf of Mewbourne Oil Company (MOC), Souder, Miller & Associates (SMA) has prepared this report to describe the assessment, initial delineation, and mitigation of a release associated with the Red Hills West SWD #001 release site. The site is located in Section 16, T 26S, R 32E NMPM, Lea County, New Mexico, on land owned by the State of New Mexico. Figure 1 illustrates the vicinity and location of the site. Field activities and data acquisition were performed by others and are presented within this summary report.

This report also documents the use of a "soil amendment for the treatment of brine affected sodic soils"(Evans SOS Environmental). DeSalt Plus^{tm} is a proprietary blend of additives Calcium, Nitrogen and surfactants produced by SOS Environmental INC. The SDS sheet is located in Appendix D for reference. DeSalt Plus^{tm} was applied to the affected area after completion of a Site Relative Risk Assessment based on EPA 600-2.87, which indicated a low risk of vertical migration of salt to ground water at the Red Hills West SWD #001 release site.

SMA does not distribute, apply or profit in any way from the DeSalt Plus soil amendment, so any mention in this closure report is purely for documentation. SMA has found through its 35 years of industry experience that similar compositions containing a readily available calcium ionic source have proven to be effective, contingent on site soil properties. While freshly contaminated sites are readily amendable with the application of chemicals, historic or older contaminated sites require specific preparations. Water is the primary driving force for the removal of sodium species from the vegetation or plant root zone. Thus, the degree and frequency of irrigation have critical effects on these types of remediation.

SMA used API AMIGO to support the conclusion that there is not an immediate threat to groundwater due to this release. The version of AMIGO employed uses a library of HYDRUS-1D unsaturated flow model results from southeastern New Mexico and a simple groundwater mixing model to estimate chloride concentrations in the vadose zone and in an underlying water table aquifer. Refer to details in Appendix C.

2.0 Site Ranking and Land Jurisdiction

The release site is located approximately 15 miles northeast of the Pecos River, in an area owned by the State with an elevation of approximately 3,200 feet above sea level. After evaluation of the site using aerial photography and topographic maps, and New Mexico Office of the State Engineer's (NMOSE) records, depth to groundwater is estimated to be greater than 100 feet below ground surface (bgs).

SMA searched the NMOSE online water well database for water wells in the vicinity of the release. There are two wells located within a one mile radius of the site. Figure 1 depicts the site vicinity and Figure 2 shows the site itself. The physical location of this release is within the jurisdiction of NMOCD.

Based on the NMOCD Guidelines Ranking Criteria, this release location has been assigned a NMOCD ranking of 0 which requires a soil remediation standard of 10 parts per million (ppm) benzene, 50 ppm combined benzene, toluene, ethyl-benzene, and total xylenes (BTEX), and 5000 ppm total petroleum hydrocarbons (TPH). Table 1 illustrates site ranking rationale.

3.0 Assessment and Initial Results

On August 4th, August 13th, September 2nd, and September 16th 2015, after receiving 811 clearances, Diversified Field Services Inc. (DFSI) field personnel assessed the release area onsite with a backhoe, Photo Ionization Detector (PID), and a mobile chlorides titration kit. The potentially affected area was found to be approximately 1000 feet long and 200 feet wide.

The site delineation potholes were carried to depths of six feet below surface grade (bgs). Bottom hole samples were found to exhibit only background levels of all contaminants of concern at approximately two feet (bgs) on the eastern area of the spill. The western portion contained the highest concentration of contaminants at depths below 2 foot (bgs), due to the proximity to the point of failure of the tank battery and site topography. For additional information on the initial soil results and site assessment, please refer to Field Screening Data provided by DFSI found in Table 3. Specific sample locations for all samples are depicted on Figure 2 (Sample Location Map) along with sampling details. Field screening results are noted in Table 3 in the appendices along with the summary of laboratory analytical results. Samples were collected and processed by DFSI field personnel according to NMOCD soil sampling procedures.

Because the spilled material was limited to produced water and field screening did not indicate the presence of petroleum, the samples were sent under chain-of-custody protocols to Cardinal Analysis Laboratory for analysis for Total Chlorides using EPA Method 300.0 and Method 8021B for BTEX.

4.0 Soil Remediation Summary

After the produced water release, Na+ cations were present in overwhelming concentration displacing other cationic species, such as calcium, magnesium, and potassium from the soil structure. Adsorption of Na+ species disperses soil particles, which subsequently diminishes the drainage characteristics of soil. The application of the soil amendment DeSalt Plustm was intended to counteract this effect and allow the cations (Na+) to leach with the Cl- ions. Further irrigation with fresh water and rainfall helped leach Cl- or Na+ ions out of the soil system to a greater depth.

There were 26 separate DFSI supervised irrigation events on location. By report, each irrigation event ranged from 2 to 4 acre/inches of water applied. DFSI conducted field sampling on August 4th, August 13th, September 2nd, and September 16th 2015. The field samples collected on September 16th 2015 indicated that the salt plume had moved low enough in the soil profile that capillary suction would not return it to the root zone. Once the field samples where confirmed by laboratory analysis, MOC and DFSI withdrew heavy irrigation on the location. With the brine plume located in the soils B horizon, a meeting was scheduled with NMOCD and NMSLO to update and present the preliminary field data.

DFSI returned to the site on October 12, 2015 to begin the NMOCD requested soil column delineation of affected soils, with approval from area utilities owners via 811 and the NMOCD. DFSI continuously guided the soil bore activities by collecting composite soil samples for field screening with a mobile titration unit (EPA 4500) and a calibrated PID. In the western area of the spill is represented by AUGER BORE PT. 1 near the locations pad. Sample locations AUGER

BORE PT. 2 and AUGER BORE PT. 3 are east of the location in the affected pasture shown in Figure 2.

The laboratory confirmed field data shown in Figures 3 and 4 were collected by DFSI over the course of the remedial project and have been averaged to represent specific depths and sample blocks. All raw data is located (Appendix E).

5.0 Conclusions and Recommendations

The attached sample data confirms that the release affected pasture has been successful remediated. The vadose zone outside the lease meets all NMODC closure requirements. The brine water plume has been effectively isolated in the soils B-horizon or low permeability zone. Because of the soils sandy nature(BH—Berino-Cacique) of the area soil type there is a very low risk of capillary rise or the brine plume being drawn out of the B-horizon. The surface soil (0 – 3 ft.) type is characterized by the USDA, “as well drained sandy deposits with little to no water holding capacity.” The location’s B-horizon is characterized by the USDA as “cemented material with very low water transitivity.”

Even though all assessments of the area and the spill have shown a low threat to groundwater resources, SMA recommends post spill monitoring of the location’s vegetation. Revegetation is key to isolating the brine plume from the groundwater and minimizes or prevents water from infiltrating down. The location has soils with the right physical properties and hydraulic characteristics to contain the brine plume. The reestablishment of native vegetation to reduce the flux rate of water through the soils’ cemented B-horizon would serve to lower the risk to groundwater even further. Under these conditions, the soil has more capacity to absorb and control moisture, thereby reducing the potential of leaching.

NMOCD Guidelines for Remediation of Leaks, Spills, and Releases have established the following action levels for contaminants of concern with a site ranking of 0: 10 ppm (mg/kg) Benzene, 50 ppm total BTEX, and 5000 ppm TPH. The release consisted of produced water and evidence of petroleum impacts was not found during the initial assessment and delineation.

Laboratory analytical results for all final closure samples collected were below NMOCD action levels for Benzene, BTEX, and TPH as well as below laboratory detection limits for the methods used. No further remedial activities are recommended.

Soil contaminant sampling points are illustrated in Figure 2. A summary of related laboratory analytical results is included in Figure 6. Laboratory analytical reports are included in Appendix C.

Photo documentation is available by request.

6.0 Closure and Limitations

The scope of our services consisted of the preparation of this summary report of the spill assessment and subsequent remedial activities as well as a summary of the closure documentation. SMA has provided interpretation of data provided by others, regulatory liaison,

and preparation of the recommendations included herein. All work has been performed in accordance with generally accepted professional environmental consulting practices for oil and gas releases in the Permian Basin in New Mexico.

If there are any questions regarding this report, please contact either Austin Weyant at 575-689-7040 or Cindy Gray at 505-325-7535.

Submitted by: Reviewed by:

SOUDER, MILLER & ASSOCIATES

Austin Weyant
Project Scientist

Cynthia Gray, CHMM
Senior Scientist

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FIGURE 1
VICINITY MAP

FIGURE 2

DETAILED SITE AND SAMPLE MAP

FIGURE 3
AVERAGE CHLORIDE CONCENTRATION IN THE TOP 3 FT OVER TIME

FIGURE 4
AVERAGE CHLORIDE SOIL MAP

FIGURE 5

BIO BARRIER DESIGN AND DATA

FIGURE 6

AFFECTED SOILS CROSS SECTION

FIGURE 7

EPA 4500 METHOD CORRELATION TO EPA METHOD 300.0 GRAPH

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RELEASE INFORMATION AND SITE RANKING

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Appendix C:
API Amigo Summary