APPROVED
By Olivia Yu at 11:54 am, Sep 07, 2017

NMOCD approves of the proposed delineation plan for 1RP-4622.

1RP-4622
AMENDED DELINEATION PLAN
New Mexico DE State Well #1
Crude Oil Spill

Lea County, New Mexico

Latitude: N33.8368089645864°
Longitude: W-103.293127712051°

LAI Project No. 17-0179-01

August 22, 2017

Prepared for:

Kevin O. Butler & Associates, Inc.
P.O. Box 1171
Midland, Texas 79701

Prepared by:

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Mark J. Larson, P.G.
Certified Professional Geologist #10490

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1.0 INTRODUCTION

This delineation plan is submitted to the New Mexico Oil Conservation Division (OCD) District 1 on behalf of Kevin O. Butler & Associates, Inc. (KOB) for a crude oil spill at the New Mexico DE State Well #1 (Site) located in Unit F (SE/4, NW/4), Section 18, Township 17 South, Range 37 East, in Lea County, New Mexico. The geodetic position is North 32.8368089645864° and West -103.298127712051°. Figure 1 presents a location and topographic map. Figure 2 presents an aerial map.

1.1 Background

The spill occurred on January 20, 2014[1], after the stuffing box developed a leak due to freezing conditions. The leak caused crude oil as a spray and liquid to migrate north of the well covering an estimated area approximately 1,881 square feet or about 0.043 acre. On January 30, 2017, the lease pump (Buddy Copeland) verbally reported the spill to OCD which advised KOB to cover the affected area with clean soil due to a crude oil spray. OCD later required KOB to remediate the spill. The surface owner is the State of New Mexico State Land Office (SLO). On February 22, 2017, the initial C-141 was submitted to OCD District 1 and approved on March 1, 2017, with conditions that KOB will submit a plan to delineate the spill prior to conducting remediation action. Attachment A presents the initial C-141.

1.2 Physical Setting

The physical setting is as follows:

- Elevation is approximately 3,825 feet above mean sea level (amsl);
- Topography slopes towards the southeast;
- The nearest surface water feature is a stock tank located about 2,500 feet southeast from the Site;
- The soils are designated as "Kimbrough Gravelly Loam" and "Kimbrough-Lea complex", consisting of calcareous alluvium derived from reworking the Blackwater Draw (Pleistocene) and Ogallala (Pliocene) formations, in descending order;
- The soil developed over cemented material (caliche);
- The upper geological unit is the Tertiary-age Blackwater Draw and Ogallala formations, in descending order, comprised of very fine to medium-grained quartz sand and gravel, with minor amount of silt and clay with indistinct to massive crossbeds;
- The Ogallala formation is underlain by clay, silty clay, shale and sandstone of the Chinle formation (Triassic) and is about 300 feet thick;
- According to records from the U.S. Geological Survey (U.S.G.S.) and State of New Mexico Office of the State Engineer (OSE) the nearest fresh water well is located in Unit J (NW/4, SW/4), Section 18, Township 17 South, Range 37 East or about 2,500 feet southeast

1. The C-141 states the spill occurred on January 20, 2014 however the correct date is January 20, 2017

(down gradient) from the Site;

- The well is used for livestock watering with depth to groundwater reported at approximately 50.62 feet below ground surface (bgs) in 1996.

1.3 Remediation Action Levels

Remediation action levels (RRAL) were calculated for benzene, BTEX and TPH based on the following criteria established by the OCD in "*Guidelines for Remediation of Leaks, Spills and Releases, August 13,* 1993":

Criteria	*Result*	*Score*
Depth-to-Groundwater	50 - 99 feet	10
Wellhead Protection Area	No	0
Distance to Surface Water Body	>1000 Horizontal Feet	0

The following RRAL apply to the release for ranking score: 10

- Benzene 10 mg/Kg
- BTEX 50 mg/Kg
- TPH 1,000 mg/Kg

2.0 DELINEATION PLAN

LAI proposes to use an air rotary rig and jam tube sampler to collect soil samples at two (2) locations inside the containment and three (3) locations outside the containment, as shown on Figure 2. Soil samples will be collected from each location at 0 to 1, 3 to 4, 5 to 6, 7 to 8, 10 to 11 and 15 to 16 feet bgs. The samples will be tested in the field for chloride using QuanTab® chloride test strips (300 - 6,000 mg/L). Additional samples may be collected if chloride is not delineated vertically to 600 milligrams per kilogram (mg/Kg) with an additional ten (10) vertical feet below the deepest sample from each location. The samples will be delivered to a qualified laboratory under preservation and chain of custody. The laboratory will analyze soil samples for benzene, toluene, ethylbenzene and xylene (BTEX) by EPA SW-846 Method 8021B, total petroleum hydrocarbons (TPH), including gasoline range organics (GRO), diesel range organics (DRO) and oil range organics (ORO) by EPA SW-846 Method 8015M and chloride by EPA Method 300. Figure 2 presents the boring locations and approximate latitude and longitude.

3.0 REMEDIATION PLAN

KOB will include a remediation plan in the delineation report to be submitted to the OCD upon receipt of the laboratory report.

Figures

Figures

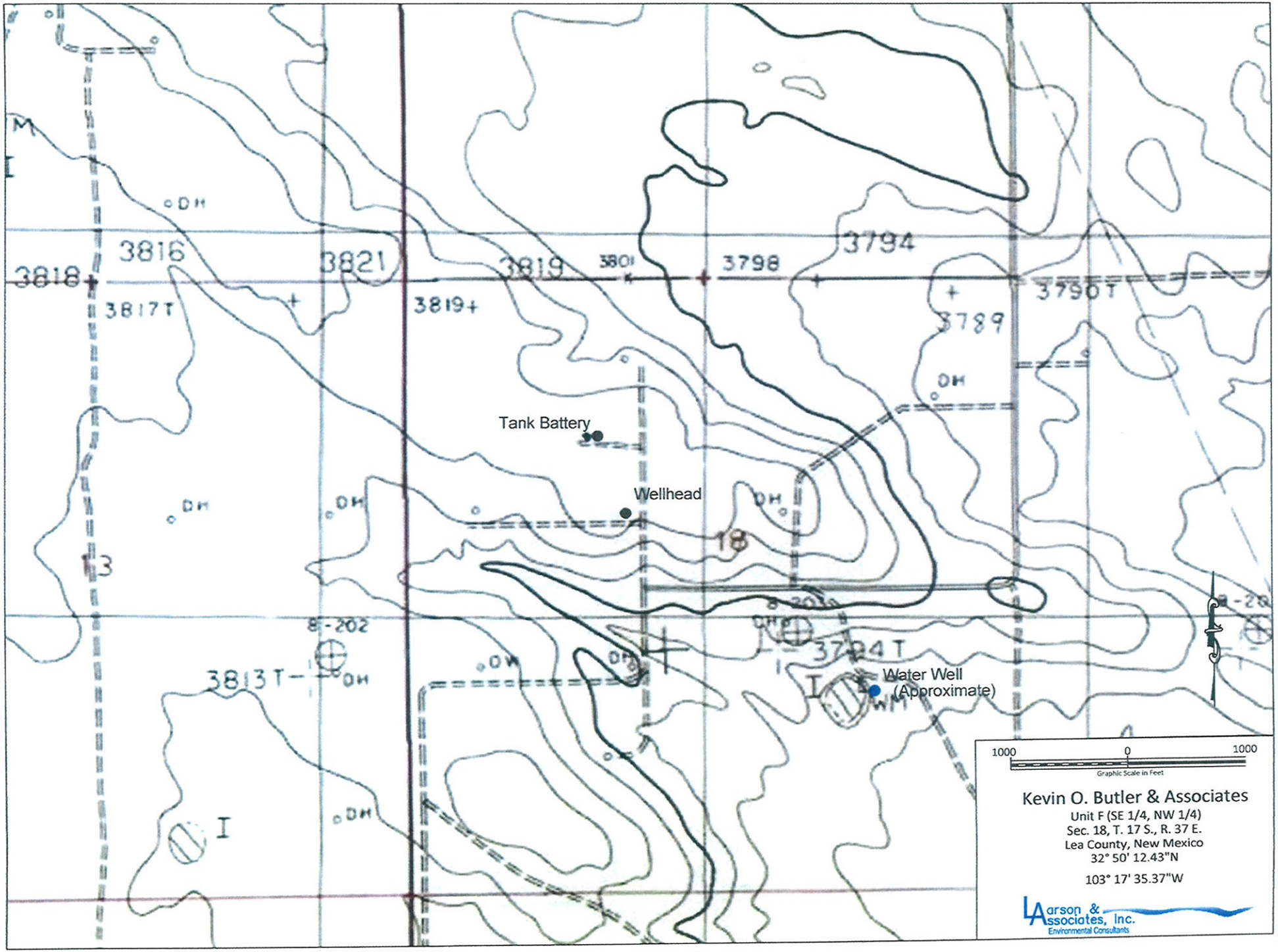

Figure 1 - Topographic Map

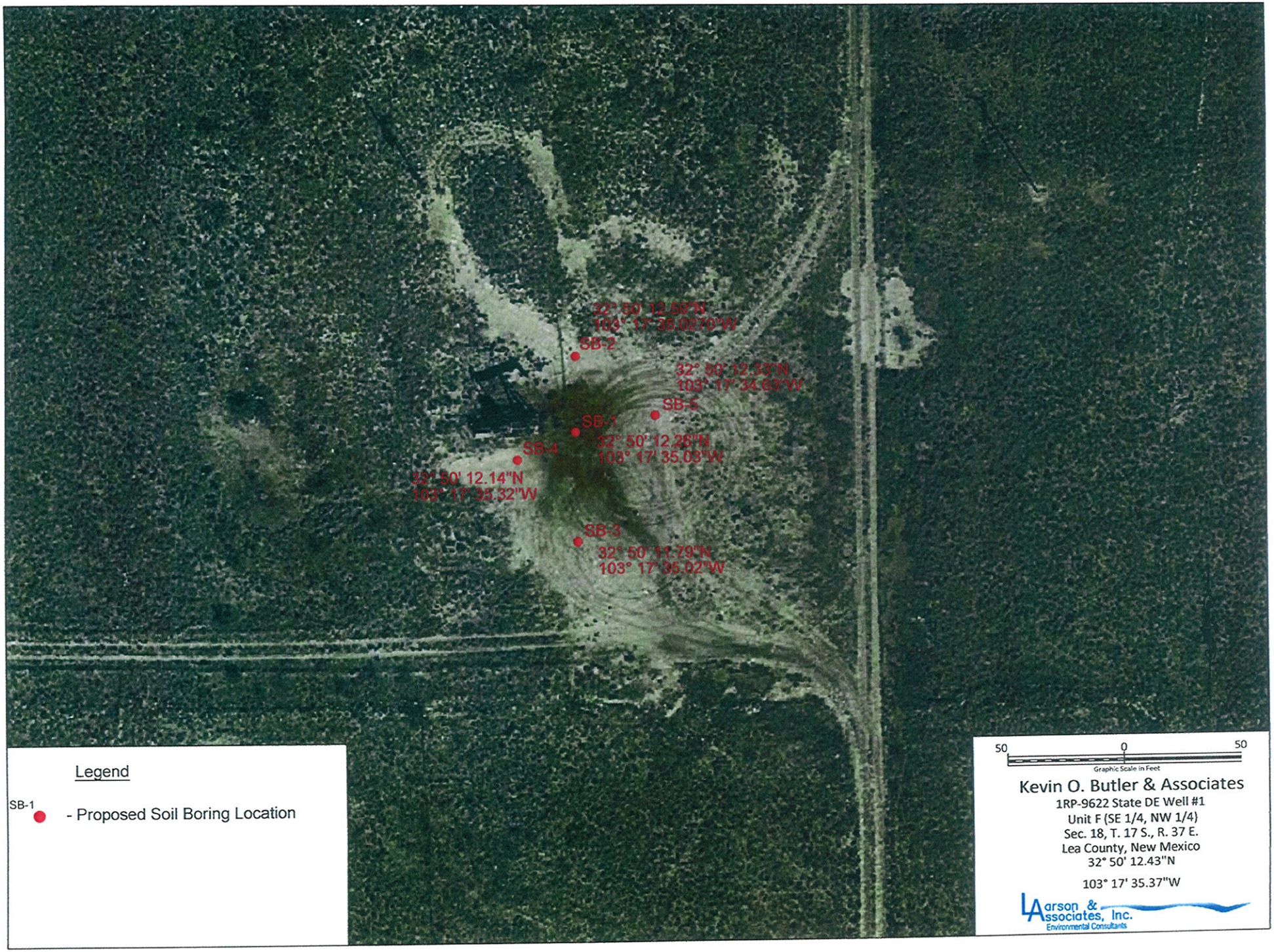

Figure 2 - Aerial Map

Attachment A

Initial C-141

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 8, 2011

Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company Kevin O. Butler & Associates, Inc.	Contact Lisa Builta
Address P.O. Box 1171 Midland, TX 79701	Telephone No. 432-682-1178
Facility Name New Mexico DE State	Facility Type Well

Surface Owner	Mineral Owner	API No. 30-025-21618

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
F	18	17S	37E	1980	FNL	1903	FWL	LEA

Latitude 32.8368089645864 Longitude 103.293127712051

NATURE OF RELEASE

Type of Release Oil	Volume of Release / Volume Recovered
Source of Release Off Setting Lease	Date and Hour of Occurrence 1/20/14 / Date and Hour of Discovery 01/30/2017
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Buddy Copeland - Pumper / George - OCD
By Whom? George - OCD	Date and Hour 01/30/2017
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.

If a Watercourse was Impacted, Describe Fully.*

RECEIVED
By Olivia Yu at 7:45 am, Mar 01, 2017

Describe Cause of Problem and Remedial Action Taken.*

Due to below freezing conditions, stuffing box sprung a small spray. Pumper met OCD at location where OCD advised that less than 1/2 gal. of oil had sprayed. Pumper was advised by OCD to take a shovel and cover. Advised that there was nothing to report by OCD.

Describe Area Affected and Cleanup Action Taken.*

Clean dirt was placed over the spray as instructed by OCD. Advised by the State that further clean up actions will be required. Kevin is to meet with Amber Groves. After this meeting, a corrective action plan will be sent in the form of a new C-141 to the State and OCD for approval.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: Lisa Builta	OIL CONSERVATION DIVISION
Printed Name: Lisa Builta	Approved by Environmental Specialist:
Title: Compliance Reporting	Approval Date: 3/1/2017 / Expiration Date:
E-mail Address: lisab@kobutler.com	Conditions of Approval: see attached directive / Attached ☑
Date: 02/22/2017 Phone: 432-682-1178	

* Attach Additional Sheets If Necessary

1RP-4622 nOY1706027706 pOY1706027982

Operator/Responsible Party,

The OCD has received the form C-141 you provided on _2/22/2017_ regarding an unauthorized release. The information contained on that form has been entered into our incident database and remediation case number __1R-_4622_has been assigned. **Please refer to this case number in all future correspondence.**

It is the Division's obligation under both the Oil & Gas Act and Water Quality Act to provide for the protection of public health and the environment. Our regulations (19.15.29.11 NMAC) state the following,

> *The responsible person shall complete division-approved corrective action for releases that endanger public health or the environment. The responsible person shall address releases in accordance with a remediation plan submitted to and approved by the division or with an abatement plan submitted in accordance with 19.15.30 NMAC.* [emphasis added]

Release characterization is the first phase of corrective action unless the release is ongoing or is of limited volume and all impacts can be immediately addressed. Proper and cost-effective remediation typically cannot occur without adequate characterization of the impacts of any release. Furthermore, the Division has the ability to impose reasonable conditions upon the efforts it oversees. **As such, the Division is requiring a workplan for the characterization of impacts associated with this release be submitted to the OCD District _1_ office in __Hobbs____ on or before _4/1/2017_. If and when the release characterization workplan is approved, there will be an associated deadline for submittal of the resultant investigation report. Modest extensions of time to these deadlines may be granted, but only with acceptable justification.**

The goals of a characterization effort are: 1) determination of the lateral and vertical extents along with the magnitude of soil contamination. 2) determine if groundwater or surface waters have been impacted. 3) If groundwater or surface waters have been impacted, what are the extents and magnitude of that impact. 4) The characterization of any other adverse impacts that may have occurred (examples: impacts on vegetation, impacts on wildlife, air quality, loss of use of property, etc.). To meet these goals as quickly as possible, the following items must, at a minimum, be addressed in the release characterization workplan and subsequent reporting:

• Horizontal delineation of soil impacts in each of the four cardinal compass directions. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C_6 thru C_{36}), and for chloride by Method 300. This is not an exclusive list of potential contaminants. Analyzed parameters should be modified based on the nature of the released substance(s). Soil sampling must be both within the impacted area and beyond.

• Vertical delineation of soil impacts. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C_6 thru C_{36}), and for chloride by Method 300. As above, this is not an exclusive list of potential contaminants and can be modified. Vertical characterization samples should be taken at depth intervals no greater than five feet apart. Lithologic description of encountered soils must also be provided. At least ten vertical feet of soils with contaminant concentrations at or below these values must be demonstrated as existing above the water table.

• Nominal detection limits for field and laboratory analyses must be provided.

• Composite sampling is not generally allowed.

• Field screening and assessment techniques are acceptable (headspace, titration, EC [include algorithm for validation purposes], EM, etc.), but the sampling and assay procedures must be clearly defined. Copies of field notes are highly desirable. A statistically significant set of split samples must be submitted for confirmatory laboratory analysis, including the laterally farthest and vertically deepest sets of soil samples. Make sure there are at least two soil samples submitted

for laboratory analysis from each borehole or test pit (highest observed contamination and deepest depth investigated). Copies of the actual laboratory results must be provided including chain of custody documentation.

•Probable depth to shallowest protectable groundwater and lateral distance to nearest surface water. If there is an estimate of groundwater depth, the information used to arrive at that estimate must be provided. If there is a reasonable assumption that the depth to protectable water is 50 feet or less, the responsible party should anticipate the need for at least one groundwater monitoring well to be installed in the area of likely maximum contamination.

• If groundwater contamination is encountered, an additional investigation workplan may be required to determine the extents of that contamination. Groundwater and/or surface water samples, if any, must be analyzed by a competent laboratory for volatile organic hydrocarbons (typically Method 8260 full list), total dissolved solids, pH, major anions and cations including chloride and sulfate, dissolved iron, and dissolved manganese. The investigation workplan must provide the groundwater sampling method(s) and sample handling protocols. To the fullest extent possible, aqueous analyses must be undertaken using nominal method detection limits. As with the soil analyses, copies of the actual laboratory results must be provided including chain of custody documentation.

• Accurately scaled and well-drafted site maps must be provided providing the location of borings, test pits, monitoring wells, potentially impacted areas, and significant surface features including roads and site infrastructure that might limit either the release characterization or remedial efforts. Field sketches may be included in subsequent reporting, but should not be considered stand-alone documentation of the site's layout. Digital photographic documentation of the location and fieldwork is recommended, especially if unusual circumstances are encountered.

Nothing herein should be interpreted to preclude emergency response actions or to imply immediate remediation by removal cannot proceed as warranted. Nonetheless, characterization of impacts and confirmation of the effectiveness of remedial efforts must still be provided to the OCD before any release incident will be closed.

Jim Griswold
OCD Environmental Bureau Chief
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Santa Fe, New Mexico 87505
505-476-3465
jim.griswold@state.nm.us