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CONFIDENTIAL

WORK PLAN  
FOR THE CHARACTERIZATION OF IMPACTS

NOVEMBER 20, 2017

OWL SWD OPERATING, LLC  
UNIT LETTERS M, N, C, D, SECTIONS 9 AND 4,  
T26S, R36E  
LEA COUNTY, NEW MEXICO  
CASE NO. 1RP - 4860

**PREPARED FOR:**

Ms. OLIVIA YU  
ENVIRONMENTAL SPECIALIST  
STATE OF NEW MEXICO ENERGY MINERALS AND NATURAL RESOURCES  
OIL CONSERVATION DIVISION  
1625 NORTH FRENCH DRIVE  
HOBBS, NEW MEXICO 88240

**APPROVED**

*By Olivia Yu at 7:36 am, Dec 11, 2017*

**PREPARED BY:**



ENVIRONMENTAL & CIVIL ENGINEERING

500 MOSELEY ROAD  
CROSS ROADS, TEXAS 76227  
(940) 387-0805 PHONE  
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NMOCD approves of the proposed  
delineation plan for 1RP-4860 with these  
stipulations:

- 1) Permissible chloride levels for vertical  
and horizontal delineation are 600 mg/kg.
- 2) Establish at least 2 soil sampling  
locations south of the road.



November 20, 2017

New Mexico Energy Minerals and Natural Resources Department (NM EMNRD)  
Oil Conservation Division (OCD) – District 1  
Ms. Olivia Yu  
Environmental Specialist  
1625 North French Drive  
Hobbs, New Mexico 88240

**Re: *Work Plan for the Characterization of Impacts Due to a Pipeline Release  
OWL SWD Operating, LLC Produced Water Pipeline Nearby Unit Letters M, N, C, D,  
Sections 9 and 4, T26S, R36E, Lea County, New Mexico – Case No. 1RP-4860***

Dear Ms. Yu:

KJE understands that the goals of the 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 (ex. Impacts on vegetation, impacts on wildlife, air quality, loss of use of property, etc.).

KJE is pleased to provide the attached Work Plan for the characterization of Impacts due to a pipeline release associated with OWL SWD Operating, LLC (OWL's) pipeline, located in Lea County, New Mexico.

If we can be of further assistance, please do not hesitate to contact us at 940-387-0805. We look forward to receiving comments in order to proceed with the project and closure.



Gregg Bessire, P.E., P.G.  
Senior Project Manager



Dena M. Vandenberg, REM, LEED AP  
Director of Environmental Services



November 20, 2017

New Mexico, Energy Minerals and Natural Resources (EMNRD)  
Oil Conservation Division (OCD) – District 1  
Ms. Olivia Yu  
Environmental Specialist  
1625 North French Drive  
Hobbs, New Mexico 88240

**Re: *Work Plan for the Characterization of Impacts Due to a Pipeline Release  
OWL SWD Operating, LLC Produced Water Pipeline Nearby Unit Letters M, N, C, D,  
Sections 9 and 4, T26S, R36E, Lea County, New Mexico – Case No. 1RP-4860***

Dear Ms. Yu:

KJ Environmental Management, Inc. (KJE) proposes to perform the following environmental consulting services for OWL SWD Operating, LLC (OWL) for the delineation portion of the project.

Environmental Investigation

The proposed scope of work will consist of performing an Environmental Investigation to evaluate the presence/absence of environmental contaminants in the soil at the above-referenced produced water release location.

KJE understands that the goals of this Work Plan and 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 (ex. Impacts on vegetation, impacts on wildlife, air quality, loss of use of property, etc.).

The Investigation will consist of the following activities:

- KJE will contact New Mexico 811 to request that they communicate with underground utility companies in the site area for location of their pipelines beneath the site and the site area.

- Multiple soil borings will be installed to the maximum depth necessary to reach chloride and other constituent delineation levels as noted below (horizontal and vertical delineation), by Geoprobe. A site map (Figure A1) is attached showing the general location and extent of the release. The proposed soil boring locations are illustrated on attached Figure A2, but the quantity of borings and boring locations may be field adjusted due to onsite conditions. The drilling contractor will be using a five (5) foot split-spoon continuous sampling device to allow for sampling of soil at two and one half (2.5) foot intervals for laboratory analysis. The actual number of borings and number of samples collected for analysis will be determined in the field based on assessment of release areas and Geoprobe access points available.
- Horizontal delineation of soil impacts will be attempted in each of the four cardinal compass directions. Adsorbed soil contamination will be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes (BTEX) by either Method 8260 or 8021, total petroleum hydrocarbons (TPH) by Method 8015 extended range (GRO+DRO+MRO; C6 thru C36), and for chloride by Method 300. KJE understands that delineation to 10 ppm Benzene, 50 ppm BTEX, 5,000 ppm TPH, and 600 ppm chlorides horizontally is required. Soil sampling will be both within the impacted area and beyond as field determined.
- Vertical delineation of soil impacts will also be attempted. Adsorbed soil contamination will be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes (BTEX) by either Method 8260 or 8021, total petroleum hydrocarbons (TPH) by Method 8015 extended range (GRO+DRO+MRO; C6 thru C36), and for chloride by Method 300. As above, this is not an exclusive list of potential contaminants and can be modified if required by OCD. Vertical characterization samples should be taken at depth intervals no greater than five (5) feet apart. Lithologic description of encountered soils will also be provided. KJE understands that delineation to 10 ppm Benzene, 50 ppm BTEX, 5,000 ppm TPH, and 250 ppm chlorides vertically is required. At least ten (10) vertical feet of soils with contaminant concentrations at or below these values will be demonstrated as existing above the water table.
- In addition to the horizontal and vertical delineation borings, KJE will install one (1) soil boring upgradient of the release area to a depth of ten (10) feet and collect background samples at two and one half (2.5) foot intervals for laboratory analysis.
- Discrete, grab soil samples will be collected from each of the two and one half (2.5) foot intervals for laboratory analysis. A clean, decontaminated sampling trowel will be used to sample from each depth interval selected. For each soil boring, soil samples will be field screened using a calibrated Photo-ionization Detector (PID) (Model RAE MINIRAE 3000 Lite 0-15K ppm) for the highest reading for each boring. The sample with the highest PID reading and the sample collected at the bottom of each boring will be submitted for laboratory analysis.

- A statistically significant set of split samples will be submitted for confirmatory laboratory analysis, including the laterally farthest from the release sites and vertically deepest set of soil samples collected. In addition, we will ensure that there are at least two samples submitted for laboratory analysis from each boring (highest contamination from PID and deepest depth investigated).
- Each soil sample will be handled with nitrile-gloved hands. The samples will be placed in clean, dedicated, laboratory-supplied, 4-ounce glass containers, and labeled with pertinent sampling information. The soil samples will be then placed in a cooling chest with adequate ice, providing a 4°C environment for sufficient preservation until delivery to Xenco Laboratory (a third-party, NELAP Certified, independent, and licensed environmental laboratory in Midland, Texas). The sample collection and handling activities will be conducted in accordance with USEPA Standard Operating Procedures and strict chain-of-custody protocols. The drilling equipment, sampling equipment, and tools will be decontaminated before and between each sampling location. All personnel will use dedicated nitrile gloves that will be changed frequently during the drilling activities.
- For this investigation, groundwater is not anticipated to be encountered during environmental drilling. According to records obtained from the New Mexico Office of the State Engineer's office Hydrology Bureau records, the minimum depth to water for the water well located closest to the release area was for a well located in the southeast corner of Section 9, and in 1996 the depth to water was 174 feet. Water from this well is from the alluvial source which would be above the Triassic Chinle which is a water bearing zone above the Santa Rosa formation. The presence and/or depth of this potential water bearing formation are unknown in the spill area. KJE will install one (1) groundwater monitoring well to a depth of 50' past the deepest contamination to verify the presence or absence and depth, if applicable, of a shallow groundwater-bearing formation. The location of the groundwater monitoring well will be determined based on the initial laboratory analysis and will be advanced in the area of highest contamination.
- If groundwater is encountered in any of the soil borings, the boring will be left open for twenty-four (24) hours to determine if substantial water accumulates for sample collection and lab analysis. After 24 hours, KJE will attempt to collect a groundwater sample using a new disposable bailer and submit the samples for laboratory analysis of BTEX, TPH, and Chloride, if possible.
- Based on information provided by OWL the owner of the surface and subsurface estates that the release occurred on is EOG Natural Resources.

#### Report of Findings

KJE will prepare and provide an electronic copy of the final report describing the findings, conclusions, and recommendations from the Environmental Investigation. KJE will present the laboratory analytical results in a tabular format and compare these levels to the OCD specified delineation levels. Accurately scaled and well-drafted site maps will be provided showing the

location of all borings, monitoring wells, potentially impacted areas, and significant surface features including roads and site infrastructure that might limit either the release characterization or remedial efforts. Digital photographic documentation of the release location and field work will also be included.

If we can be of further assistance, please do not hesitate to contact us at 940-387-0805. We look forward to receiving comments in order to proceed with the project and closure.

Sincerely,

A handwritten signature in blue ink that reads "Gregg Bessire". The signature is written in a cursive, flowing style.

Gregg Bessire, P.E., P.G.  
Senior Project Manager

A handwritten signature in blue ink that reads "Dena M. Vandenberg". The signature is written in a cursive, flowing style.

Dena M. Vandenberg, REM / LEED AP  
Director of Environmental Services

Attachments: Figure A1 – Detailed View of Release



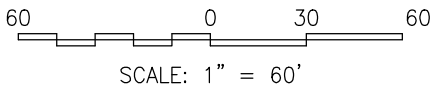
EOG RESOURCES PROPERTY

EOG RESOURCES PROPERTY

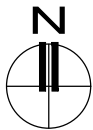
APPROXIMATE  
SPILL AREA  
(68,221 SF)

PROPOSED  
BORING  
LOCATIONS

NOTES:  
1. GOOGLE EARTH WAS USED AS AN UNDERLAY IMAGE FOR THIS MAP.  
(<http://earth.google.com/>)




LEGEND  
● PROPOSED SOIL BORING (TOTAL: 39)



REVISIONS:  
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THIS DRAWING IS TO  
BE USED FOR PERMIT  
INFORMATION  
PURPOSES ONLY.

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KJE  
ENVIRONMENTAL & CIVIL ENGINEERING

DETAILED VIEW OF RELEASE  
OWL SWD OPERATING, LLC  
JAL, NEW MEXICO  
UNITS M, N, C AND D;  
SECTIONS 9 AND 4;  
TOWNSHIP 26S RANGE 36E

DATE:  
11/20/2017

SHEET:  
**A1**