CONFIDENTIAL

WORK PLAN
FOR THE CHARACTERIZATION OF IMPACTS

OCTOBER 19, 2017

OWL SWD OPERATING, LLC
UNIT LETTER H, SECTION 32, T24S, R35E
LEA COUNTY, NEW MEXICO
CASE NO. 1RP - 4820

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 11:30 am, Nov 30, 2017

PREPARED BY:

KJE
ENVIRONMENTAL & CIVIL ENGINEERING
500 MOSELEY ROAD
CROSS ROADS, TEXAS 76227
(940) 387-0805 PHONE
(940) 387-0830 FAX

NMOCD approves of the proposed delineation plan for 1RP-4820 with these modifications:
1) Due to the presence of a surface waterbody approx. 750 ft SW, permissible TPH levels are 1000 mg/kg.
2) Vertically delineate to <= 600 mg/kg chlorides and maintained for 10 ft. further in depth.

KJE
ENVIRONMENTAL & CIVIL ENGINEERING
500 Moseley Road
Cross Roads, Texas 76227
Phone 940-387-0805
Fax 940-387-0830

October 19, 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 Letter H, Section 32, T26S, R36E, Lea County, New Mexico – Case No. 1RP-4820

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.

James L. Fox, CNRP
Environmental Project Manager

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

ENVIRONMENTAL & CIVIL ENGINEERING
500 Moseley Road
Cross Roads, Texas 76227
Phone 940-387-0805
Fax 940-387-0830

October 19, 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 Letter H, Section 32, T26S, R36E, Lea County, New Mexico – Case No. 1RP-4820

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 water wells located in the same Township and Range as where the releases occurred is 200 feet. However, the records also indicate the location may be in an area with water present in the alluvial/quaternary age formation overlaying the Triassic formation, which appears to be associated with the Antelope Draw. The presence and/or depth of this potential water bearing formation are unknown. 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.

- The New Mexico State Land Office (SLO) currently owns both the surface and subsurface estates that the release occurred on. The SLO and OCD both were notified of the spill via the C-141 Form submittal and will be copied together in further correspondence throughout the timeline of site investigation, delineation, and remediation efforts. Following the approval of this work plan, a Right of Entry (ROE) Request for Remediation application will be submitted with the associated fees to the SLO for approval.

During the initial site visit to determine approximate preliminary spill area, it was discovered that the pipeline release had also migrated across the southern property boundary onto the New Mexico Department of Transportation (NMDOT) easement of State Highway 128, approximately 0.31 miles west of mile marker 40. At this time, KJE has notified NMDOT of the spill and is working with District 2 of the NMDOT to comply with their access requirements.

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 locations 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.

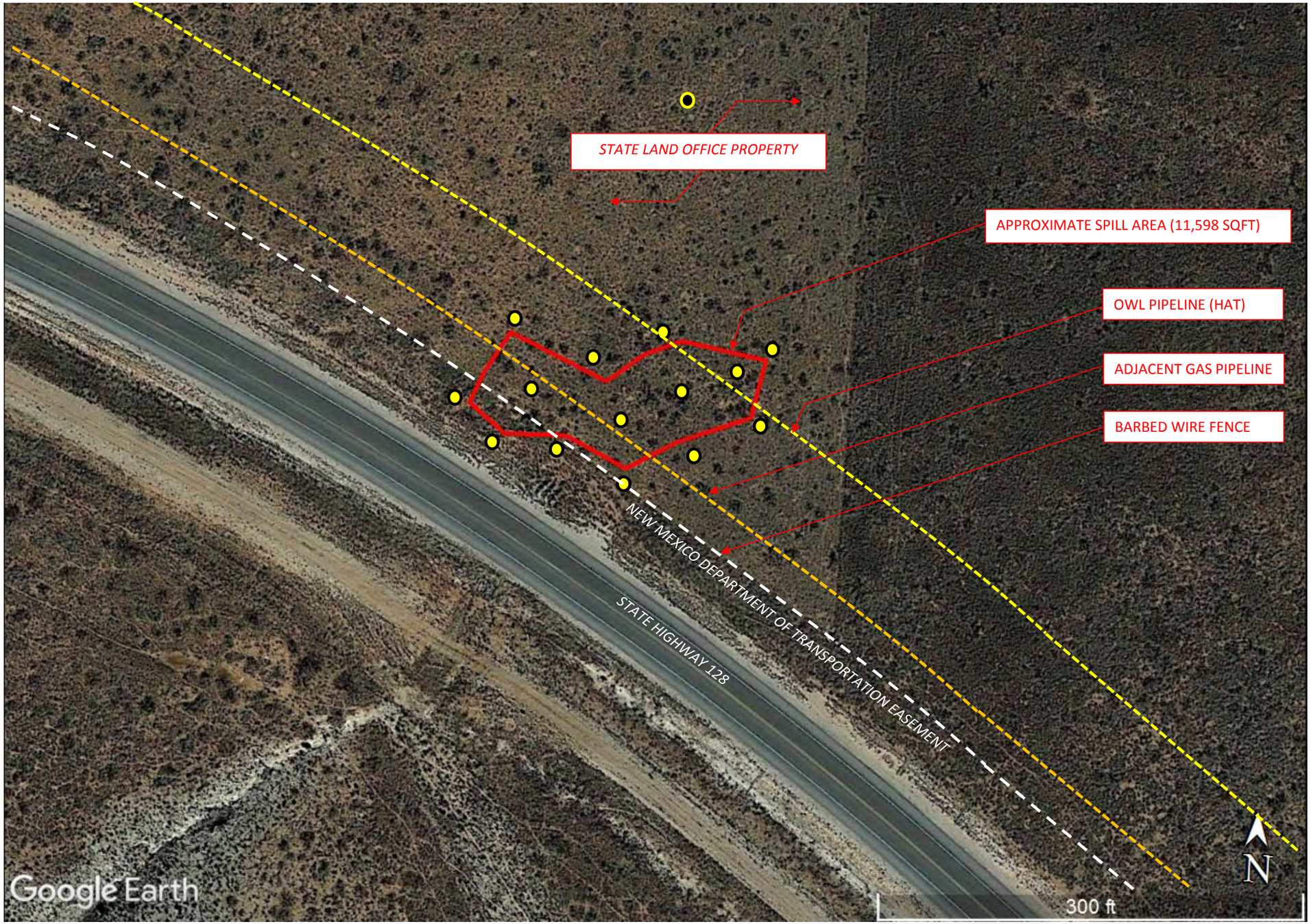
Sincerely,

James Fox, CNRP
Environmental Project Manager

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

Attachments: Figure A1 – General View of Release
Figure A2 – Detailed View of Release

Figure:	Scale:			
A1	NTS	**General View of Release** OWL SWD Operating, LLC Jal, New Mexico Unit H Section 32 Township 24S Range 35E	KJE ENVIRONMENTAL & CIVIL ENGINEERING	N
	Date: October 2017			



LEGEND

- PROPOSED BORING LOCATION
- PROPOSED BACKGROUND SAMPLE
- GROUNDWATER MONITORING WELL

NOTE: LOCATION OF THE GROUNDWATER MONITORING WELL WILL BE DETERMINED AFTER INITIAL LAB ANALYSIS

FLOW DIRECTION

Figure:	Scale:	**Detailed View of Release**		
A2	NTS	OWL SWD Operating, LLC Jal, New Mexico Unit H Section 32 Township 24S Range 35E	KJE ENVIRONMENTAL & CIVIL ENGINEERING	N
	Date: October 2017			