

APPROVED

By Olivia Yu at 7:28 am, Oct 05, 2017

**1RP-4818
DELINEATION PLAN
SALADO DRAW RWCS 1RC-11
PRODUCED WATER SPILL
Lea County, New Mexico**

NMOCD approves of the proposed delineation plan for 1RP-4818 with one condition: Delineate to 600 mg/kg chlorides and maintained a minimum of 5 ft. further in depth.

Latitude: N32.033822°
Longitude: W-103.638572°

LAI Project No. 17-0186-01

September 27, 2017

Prepared for:

Chevron USA Inc.
6301 Deauville Boulevard
Midland, Texas 79706

Prepared by:

Larson & Associates, Inc.
507 North Marienfeld Street, Suite 205
Midland, Texas 79701



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

This Page Intentionally Left Blank

Table of Contents

1.0	INTRODUCTION	1
1.1	Background.....	1
1.2	Physical Setting.....	1
1.3	Remediation Action Levels	2
2.0	DELINEATION PLAN	2
3.0	DELINEATION REPORT.....	3

Figures

Figure 1	Topographic Map
Figure 2	Aerial Map

Attachments

Attachment A	Initial C-141
Attachment B	Photographs

1.0 INTRODUCTION

This delineation plan has been prepared by Larson & Associate, Inc. (LAI) on behalf of Chevron USA Inc. for a produced water (treated) spill at the water recycling facility (Site) located in Unit A (NE 1/4, NE 1/4), Section 23, Township 26 South, Range 32 East, in Lea County, New Mexico. The ¹geodetic position is North 32.03382° and West -103.638572°. Figure 1 presents a location and topographic map.

1.1 Background

The spill occurred on September 13, 2017. The spill was caused by a leak in a hose on the recirculation system. This leak released approximately 1,105 barrels of treated produced water. The source of the flow was isolated and approximately 500 barrels of treated produced water was recovered by vacuum truck. The spill occurred between the North and South treated water pits. The spill flowed from the north side of the South pit to the low area between the South pit and the North pit. The spill then flowed east and west for a distance of about 600 feet and covered an area approximately 20,711 square feet or about 0.47 acres. On September 13, 2017, Chevron verbally notified the New Mexico Oil Conservation Division (OCD) District 1 and the Bureau of Land Management, as surface and mineral owner. The OCD assigned the spill remediation permit number 1RP-4818. Attachment A presents the initial C-141. Attachment B presents photographs.

1.2 Physical Setting

The physical setting is as follows:

- Surface elevation is approximately 3,150 feet above mean sea level (MSL);
- The topography slopes towards the south and southwest;
- The nearest surface water features is a seasonal playa located approximately 3,900 feet southeast of the Site.
- The surface soils are designated as "Pyote and Maljamar fine sands" which consist of approximately 30 inches of fine sand underlain by fine sandy loam to approximately 60 inches below ground surface(bgs);
- The soil is sandy eolian deposits derived from sedimentary rocks and underlain by cemented material (caliche);
- Groundwater occurs at roughly 150 feet below ground surface (bgs) according to records from the New Mexico Office of the State Engineer (NMOSE) and the U.S. Geological Survey.

1. The GPS coordinate presented is from the source of the release and varies slightly from that presented on Chevron's form C-141, submitted on September 18, 2017.

1.3 Remediation Action Levels

Recommended remediation action levels (RRALs) were calculated for benzene, total BTEX (benzene, ethylbenzene, toluene and xylenes) and Total Petroleum Hydrocarbons (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	>100 feet	0
Wellhead Protection Area	No	0
Distance to Surface Water Body	>1000 Horizontal Feet	0

The following RRAL apply to the release for ranking score: 0

- Benzene 10 mg/Kg
- BTEX 50 mg/Kg
- TPH 5,000 mg/Kg

Depth to groundwater greater than 100 feet bgs requires delineation for chloride to 1,000 milligrams per kilogram (mg/Kg).

2.0 DELINEATION PLAN

LAI proposes to use direct-push technology (DPT) to collect soil samples at six (6) locations within the spill area, six (6) locations outside the spill area and a background location. The DPT uses hydraulics to push or hammer a stainless steel core barrel (~ 4 ft long), containing a single polyethylene sample liner of approximately the same length, into the subsurface. Cores of approximately 1.7 inches in diameter and about 4 feet in length will be collected from the polyethylene sample liners. The use of the liners will minimize the possibility of cross contamination between samples. Samples will be collected to a maximum depth of approximately 12 feet bgs or until the DPT can no longer penetrate the subsurface. Additional samples may be collected deeper than 12 feet bgs depending on subsurface conditions. Each boring will be plugged with 3/8" bentonite chips and locations will be recorded using a Trimble® global positioning system (GPS). Figure 2 presents an aerial map and proposed DPT locations.

Soil samples will be collected at 1 foot increments (0 – 1', 1' – 2', 2' – 3', etc.) to the total depth of DTP penetration. A field chloride analysis will be performed to assess the chloride concentration following sample collection. The soil samples will be collected in laboratory containers and delivered under preservation and chain of custody to a qualified laboratory. The upper samples (0 feet) will be analyzed for benzene, toluene, ethylbenzene and xylenes (BTEX) and total petroleum hydrocarbons (TPH), including gasoline range organics (GRO), diesel range organics (DRO) and oil range organics (ORO) by

EPA SW-846 Methods 8021B and 8015M, respectively. Soil samples will be analyzed for chloride by EPA Method 300 to determine the extent of impact. The laboratory analysis will be compared to the OCD recommended remediation action levels (RRAL) presented in OCD publication *“Guidelines for Remediation of Leaks, Spills and Releases, August 13, 1993”*.

3.0 DELINEATION REPORT

A delineation report will be prepared and submitted to the OCD and BLM within 45 days following receipt of the laboratory report. The report will include a plan to remediate the spill, if necessary.

Figures

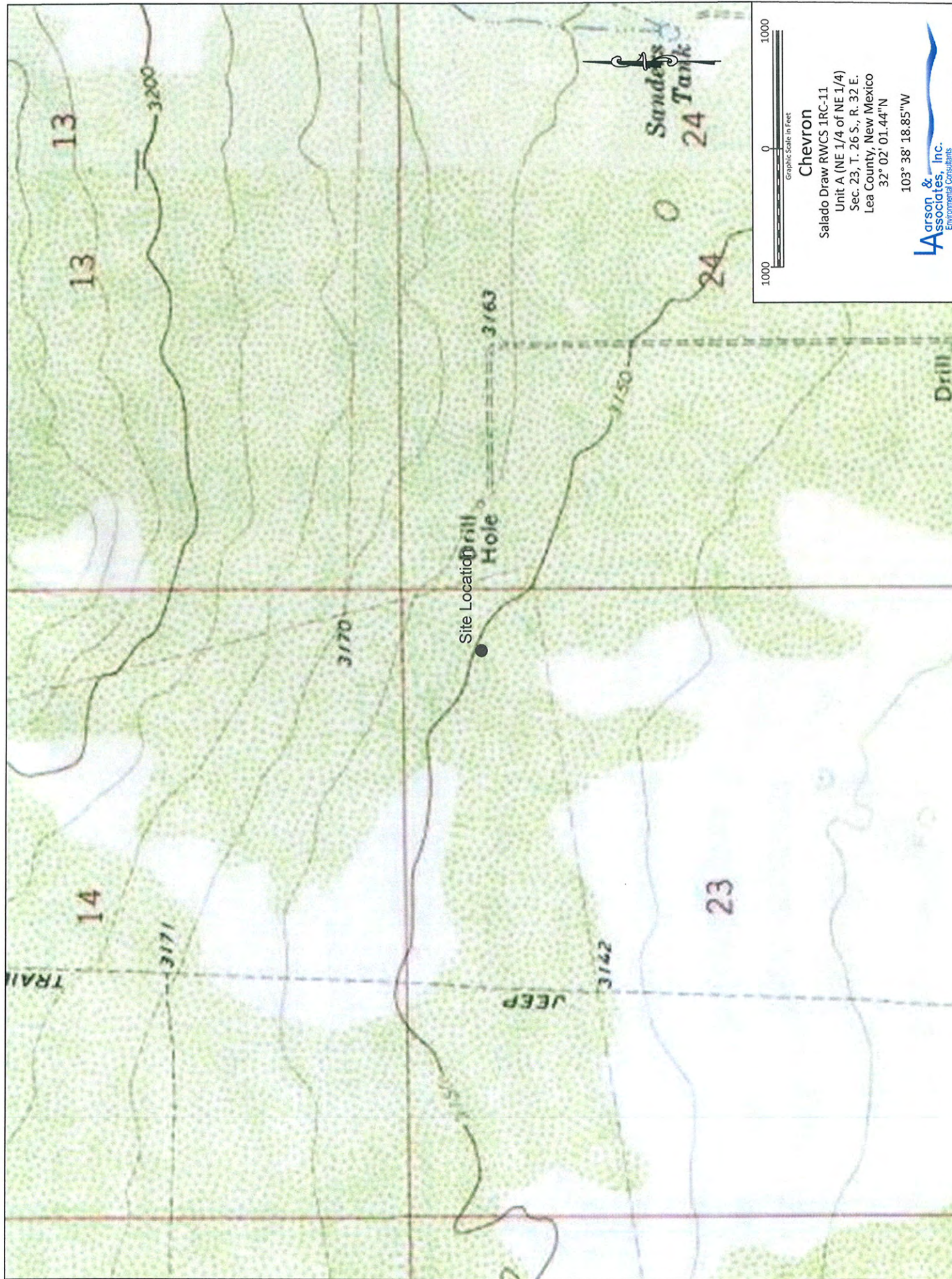


Figure 1 - Topographic Map



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	Chevron USA Inc.	Contact	Josepha DeLeon
Address	631 Deauville Blvd., Midland TX 79706	Telephone No.	575-263-0424 Cell - 432-425-1528
Facility Name	Salado Draw Water Recycling	Facility:	Water Recycling North / South
Surface Owner	Federal	Mineral Owner	Federal
		API No's.	N/A
			IRC-11

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
A	23	26S	32E					Lea

Recycling Facility: Latitude - 32.03634 N Longitude - 103.636212 W
Recycling Containment: Latitude - 32.033156 N Longitude - 103.639194 W

NATURE OF RELEASE

Type of Release	Spill	Volume of Release:	1,105 barrels treated produced water	Volume Recovered:	500 barrels treated produced water
Source of Release:	Recirculation System Hose	Date and Hour of Occurrence:	09/13/2017; 02:54 AM	Date and Hour of Discovery	09/13/2017; 10:20 AM
Was Immediate Notice Given?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom?	Maxey Brown - NMOCD, Olivia Yu - NMOCD Jim Amos - BLM, Shelly Tucker - BLM		
By Whom?	Josepha DeLeon	Date and Hour:	09/13/2017; 09:37 PM		
Was a Watercourse Reached?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.			
If a Watercourse was Impacted, Describe Fully.*	N/A				

RECEIVED

By Olivia Yu at 8:46 am, Sep 22, 2017

Describe Cause of Problem and Remedial Action Taken.*

Leak in recirculation system hose caused a spill of 1,105 barrels of treated produced water. A total of 500 barrels were recovered by vacuum truck.

Isolated source of flow and 500 barrels were captured by vacuum truck and hauled.

Describe Area Affected and Cleanup Action Taken.*

Samples of the spilled treated produced water have been collected and sent to analytical lab for analysis. Remediation plan will be submitted to NMOCD and BLM 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:	OIL CONSERVATION DIVISION		
Printed Name: Josepha DeLeon	Approved by Environmental Specialist:		
Title: HES Compliance Support - Environmental	Approval Date: 9/22/2017	Expiration Date:	
E-mail Address: jdx@chevron.com	Conditions of Approval:	Attached <input checked="" type="checkbox"/>	
Date: 09/18/2017 Phone: 575-263-0424	see attached directive		

* Attach Additional Sheets If Necessary

FTO1706148730

1RC-11

1RP-4818

nOY1726532992

pOY1726533422

Operator/Responsible Party,

The OCD has received the form C-141 you provided on 9/19/2017 regarding an unauthorized release. The information contained on that form has been entered into our incident database and remediation case number 1RP-4818 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 10/22/2017. 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; C₆ thru C₃₆), 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; C₆ thru C₃₆), 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
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
505-476-3465
jim.griswold@state.nm.us

Attachment B

Photographs



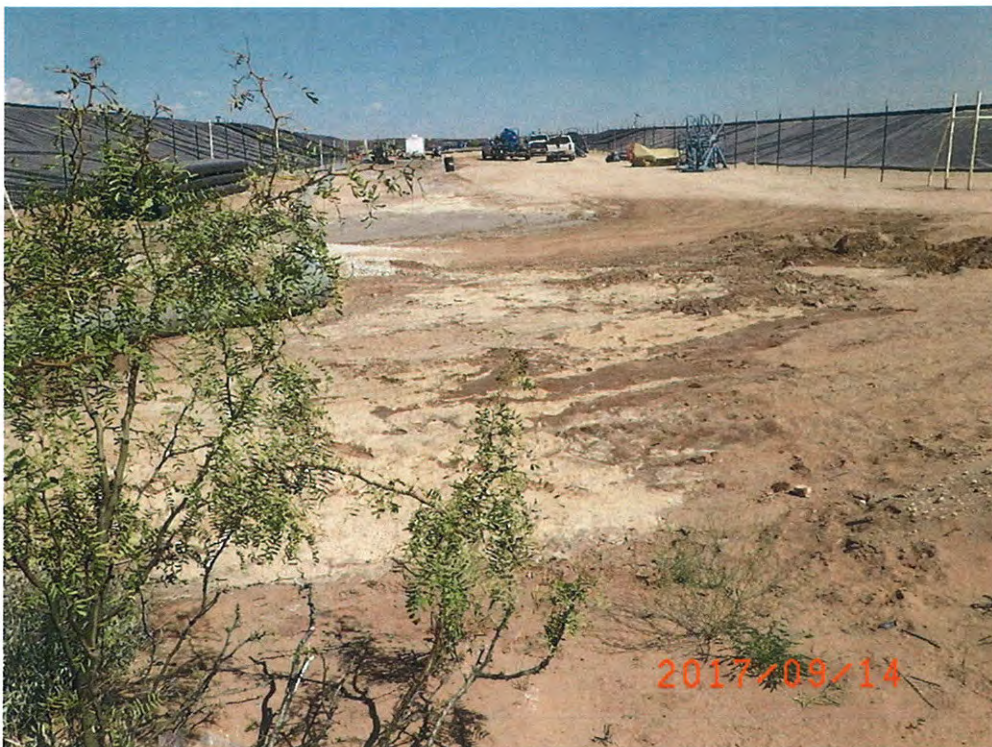
Source of Spill Viewing South



East End of Spill Viewing West



West End of Spill Viewing East



West End of Spill Viewing East