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April 11, 2016 Reference No. 074636

APPROVED

Mr. Jamie Keyes
New Mexico Energy, Minerals and Natural Resources Departmen
Oil Conservation Division
1625 N. French Drive
Hobbs, New Mexico 88240

Dear Mr. Keyes:

Re: Site Remediation Workplan
Chevron CVU 106/136
1R-2642-0
Near Buckeye, Lea County, New Mexico

1. Introduction

The Chevron Central Vacuum Unit (CVU)106/136 site (hereafter referred to as the "Site"), is located in Section 6 (Unit N),Township 18 South, Range 35 East, in Lea County, New Mexico (Figure 1). The scope of work for this work plan was developed between Chevron Environmental Management Company (CEMC), New Mexico Oil Conservation Division (NMOCD), and GHD Services Inc. (formerly Conestoga-Rovers and Associates) personnel. This work plan includes the lining/capping of a 1.8 acre area overlying chloride concentrations in the soil that have been assessed to NMOCD limits (see below). The surface property is owned by the New Mexico State Land Office (NMSLO).

Based on information available from the Petroleum Recovery Research Center Pit Rule Mapping Portal (PPRC Mapping Portal), the depth to groundwater at the Site is indicated to be between 60 and 103 feet bgs. GHD is currently working on two sites (Buckeye Compressor Station and Buckeye Vacuum) located less than a mile from the Site. The depth to groundwater at these sites is approximately 130 feet bgs. Based on this, it is estimated that the depth to groundwater is greater than 100 feet bgs.

The nearest private domestic water and public/municipal water sources are greater than 200 feet and 1,000 feet respectively from the release site. Based on the topographic map, the Site is located within 200 horizontal feet of a playa feature. Consequently, the preliminary total ranking score is 20 (see table below). Based on this, the site-specific RRAL to be applied by NMOCD for chlorides at the Site is 250 ppm.

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Table 1.1 New Mexico Oil Conservation Division Site Assessment

Ranking Criteria	Score
Depth to Ground Water (> 100 feet)	0
Wellhead Protection Area (< 1000 feet from water source, < 200 feet from domestic source)	0
Distance to Surface Body Water (<200 feet)	20
Ranking Criteria Total Score	**20**
*Because the ranking criteria total score is 20, NMOCD established RRALs are 10 ppm for benzene, 50 ppm for benzene, toluene, ethylbenzene, and xylene (BTEX), 100 ppm for total petroleum hydrocarbons (TPH), and 250 ppm for chlorides[1].	

1. NMOCD Guidance for Release Reporting and Corrective Action, August 13, 1993. The RRAL for chloride is not referenced in the 1993 guidance document because it was developed after it was published.

2. Site History

Central Vacuum Unit No. 106 (CVU-106) and Central Vacuum Unit No. 136 (CVU-136) are both located in Unit E, Section 6, Township 18S, Range 35E of Lea County, approximately 15 miles southwest of Lovington, New Mexico, along Highway 238 (Figure 1).

GHD has combined the CVU-106 and CVU-136 sites into a single area to simplify management of the releases. Consolidation of these two units into a single Site delineation effort is based on:

- Their co-located nature (release sites are comingled).
- Similar nature of released material (produced water with reported chloride concentrations of 53,000 ppm).
- Identical New Mexico Oil Conservation Division (NMOCD) Recommended Remedial Action Levels (RRALs) for chloride of 250 ppm.
- Near-contemporaneous release dates.

2.1 Central Vacuum Unit #106 (CVU-106) Injection Line Release

Chevron submitted a C-141 Release Notification and Corrective Action Form (C-141) to the NMOCD dated August 5, 2010. The NMOCD assigned a Remediation Permit number of 1RP-2642-0 to the CVU-106 release. A release of 300 barrels (bbls) of produced water from a corroded buried injection line occurred on August 2, 2010. None of the released fluid was reported to have been recovered. The C-141 reported that the released produced water had a concentration of 53,000 ppm and impacted an area of surface soils approximately 200 feet by 30 feet.

The apparent impacted area was subsequently excavated to a depth of approximately 2 feet. The dimensions of the irregularly-shaped excavation area were approximately 263 feet by 106 feet. Samples were collected on September 16, 2010 and analyzed for chlorides. Results ranged from

<16 ppm to 27,200 ppm with only five samples having chloride concentrations below 250 ppm located at the northeast, northwest and southeast corners of the existing excavation.

Additional samples were also collected by hand in the floor of the excavation, ranging from 6 inches to 8 feet in depth. Chloride concentrations in these samples ranged from 16 ppm to 13,600 ppm with the majority of the samples having concentrations above 250 ppm. Finally, soil boring BH-1 was advanced in the floor of the excavation to a depth of 30 feet below ground surface (bgs) at soil sample location SS-5, located just north of the CVU-106 well pad. Samples were collected on 5 foot vertical intervals. Samples analyzed from this boring had chloride concentrations of 250 ppm or greater with the exception of the sample collected at 30 feet bgs which had a reported chloride concentration of 96 ppm.

During excavation of the produced water-impacted soils, an undefined area was encountered exhibiting visible evidence of significant hydrocarbon contamination. The indicated depth and extent of this contamination suggested the release may have occurred, at least in part, within the area of an abandoned pit that had not been identified previously.

2.2 Central Vacuum Unit #136 (CVU-136) Injection Line Release

Chevron submitted a C-141 Form to the NMOCD dated November 5, 2010, describing a release of 276.56 bbls of produced water. The release occurred on October 30, 2010 from a corroded buried injection line. Approximately 200 bbls of the release were reported to have been recovered. The C-141 reported the dimensions of stained soil to be approximately 200 feet by 200 feet. Additionally, it was noted that the CVU-136 injection line released fluid directly adjacent to, and comingled with, the CVU-106 release area. It should be noted that the release did not originate from the CVU-136 well, but from an injection line leak that occurred near the CVU-106 injection well.

Crain collected four surface soil samples to a depth of approximately 6 inches across the apparent stained soil area. These samples were submitted for laboratory analysis of chloride. Chloride results ranged from 11,000 ppm to 13,600 ppm.

The apparent stained soil area was described by Crain to be roughly 300 feet by 208 feet, and the release was described as having comingled with the CVU-106 chloride impacted area.

3. 2013-2015 Site Assessment Summary

Assessment work performed at the Site between 2013 and 2015 included the following:

- Advancement of fifteen soil borings (B-1 through B-15) in or around the CVU-106 and CVU-136 release sites and former excavations to total depths between 20 and 51.5 feet bgs in 2013.
- A geophysical investigation was performed at the Site in 2014.
- Two additional soil borings, B-1(2) and B-2(2), were advanced at the Site in 2014
- One soil boring, MW-1, was advanced at the Site in 2015. This boring was intended to be a monitor well. However, after reaching a depth of 70 feet bgs, groundwater was not

encountered. In addition, chloride concentrations at a depth of 60 feet bgs were below the RRAL. As a result, the boring was plugged.

The data from these assessments indicated the following:

- The geophysical survey assessed the horizontal extent of the chlorides in the soil;
- The soil borings that were advanced at the site appears to confirm the horizontal extent of chlorides in the soil; and
- The soil boring advanced to 70 feet bgs (MW-1) indicated that chloride concentrations in the soil did not extend beyond 60 feet bgs. Based on the data from this boring, it does not appear that the chloride concentrations extended to the groundwater table, estimated at greater than 100 feet bgs.

Soil sample and geophysical survey assessments completed to date provide evidence that chloride concentrations above the RRAL did not reach the groundwater table. Consequently, GHD recommends the installation of a liner to prevent further lateral and vertical migration of chlorides (see Figure 2 for liner location). After a discussion with the NMOCD on November 10, 2015 the agreed plan of action for the site is the installation of a plastic liner in the area of impacted soil. The impacted area will be cleared and grubbed and the liner will be placed at ground surface. Once the liner is in place, two feet of soil will be spread atop the liner and the area will be revegetated with an approved regional seed mix. Pipelines located within the lined area will be marked on either side with a warning to repair the liner if disturbed.

4. Site Remediation Work Plan

The general scope of work for this project is proposed as follows:

- Obtain work plan approval from the NMOCD and NMSLO.
- Submit an application for a Right of Entry (ROE) for Remediation permit to the NMSLO. A copy of the work plan will be included with the ROE application.
- The 1.8 acre area that will be lined will be marked on the ground with paint or flagging.
- On-site pipelines will be cleared by the following:
  - NM811 will be contacted to spot the lines.
  - Ground penetrating radar and other utility locating methods will be performed. Lines that are identified will be flagged.
  - The depth and location of the lines will be verified by daylighting every 25 to 50 feet of length. Potholing will be performed by hydro-excavating, air knifing, or by shovel. Spoils from the potholing will be thin spread on Site.
  - A Dig Plan will be provided and signed on a daily basis.
- Once pipelines are located, the previously excavated areas will be filled in with clean soil to grade (see Figure 2).

- The area will be cleared and grubbed of vegetation. Sharp rocks and other objects that may puncture the liner will be removed. Grubbed vegetation will be placed along the edge of the area to be covered to minimize erosion.
- The area will be lined with 20 mil polyethylene. The liner will be overlapped approximately one to two feet at the edges.
- Approximately two feet of clean soil will be placed over the liner. The soil will be graded at the edges to match the surrounding contours.
- The area will be fertilized and seeded with an approved Bureau of Land Management seed mix.

Once the approved work plan scope has been completed a summary of installation activities will be provided to the NMOCD and NMSLO with a request to receive remedial closure for the CVU 106/136 release area.

5. Schedule

GHD is prepared to initiate the scope of work immediately, subsequent to NMOCD and NMSLO approvals, the availability of resources, and stakeholder concurrence. A start date and anticipated schedule will be provided following formal approval.

If you have any questions or comments with regards to this work plan, please do not hesitate to contact our Albuquerque office at (505) 884-0672. Your timely response to this correspondence is appreciated.

Sincerely,

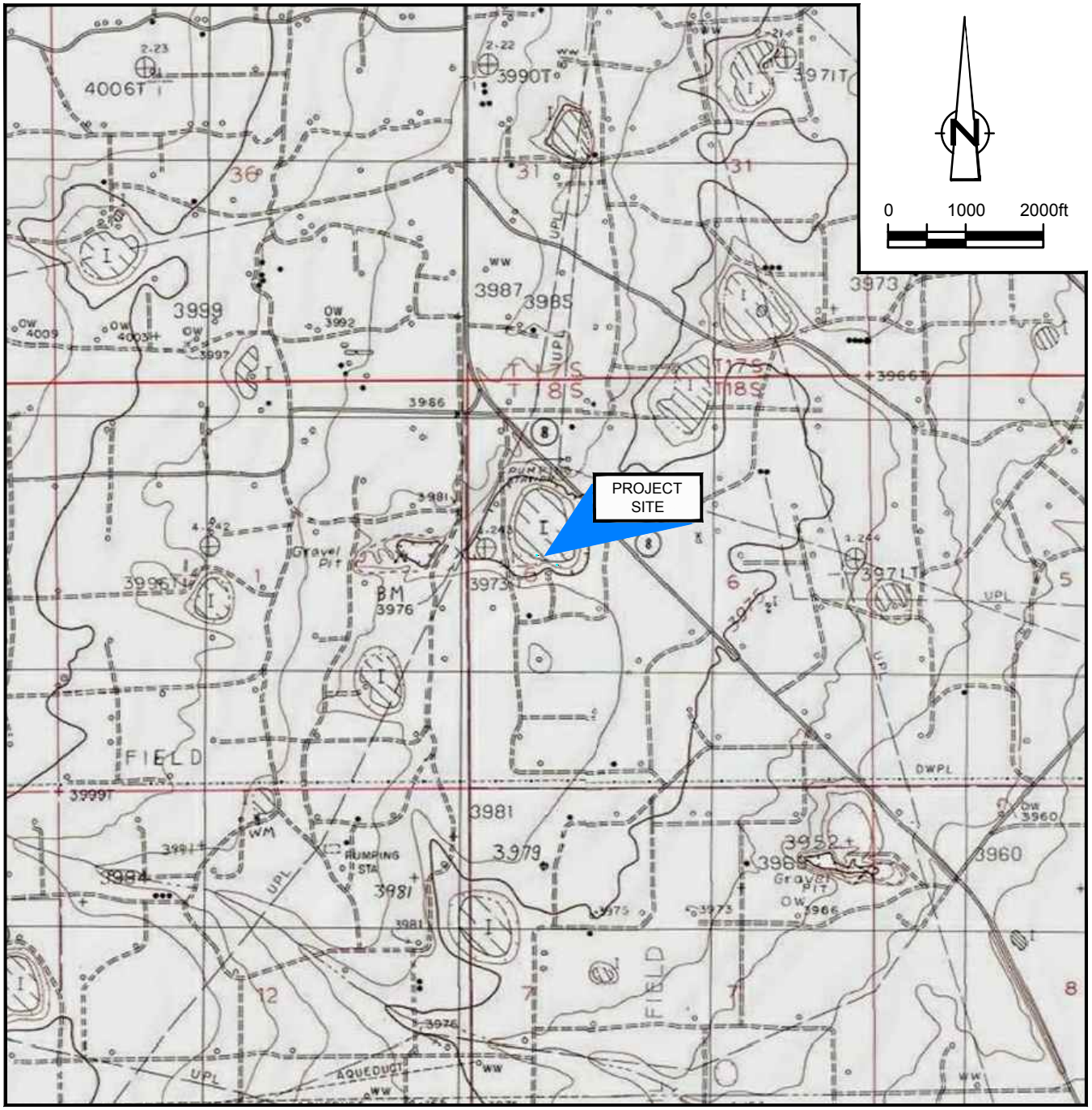
GHD

Bernard Bockisch, PMP
Sr. Project Manager

Christine Mathews
Project Scientist/Project Coordinator

BB/mc/1

Figures



SOURCE: USGS 7.5 MINUTE QUAD
"BUCKEYE AND LOVINGTON SW, NEW MEXICO"

LAT/LONG: 32.7779° NORTH, 103.5021° WEST
COORDINATE: NAD83 DATUM, U.S. FOOT
STATE PLANE ZONE - NEW MEXICO EAST

Figure 1

SITE LOCATION MAP
CVU No.136 AND CVU No.106
LEA COUNTY, NEW MEXICO
Chevron Environmental Management Company

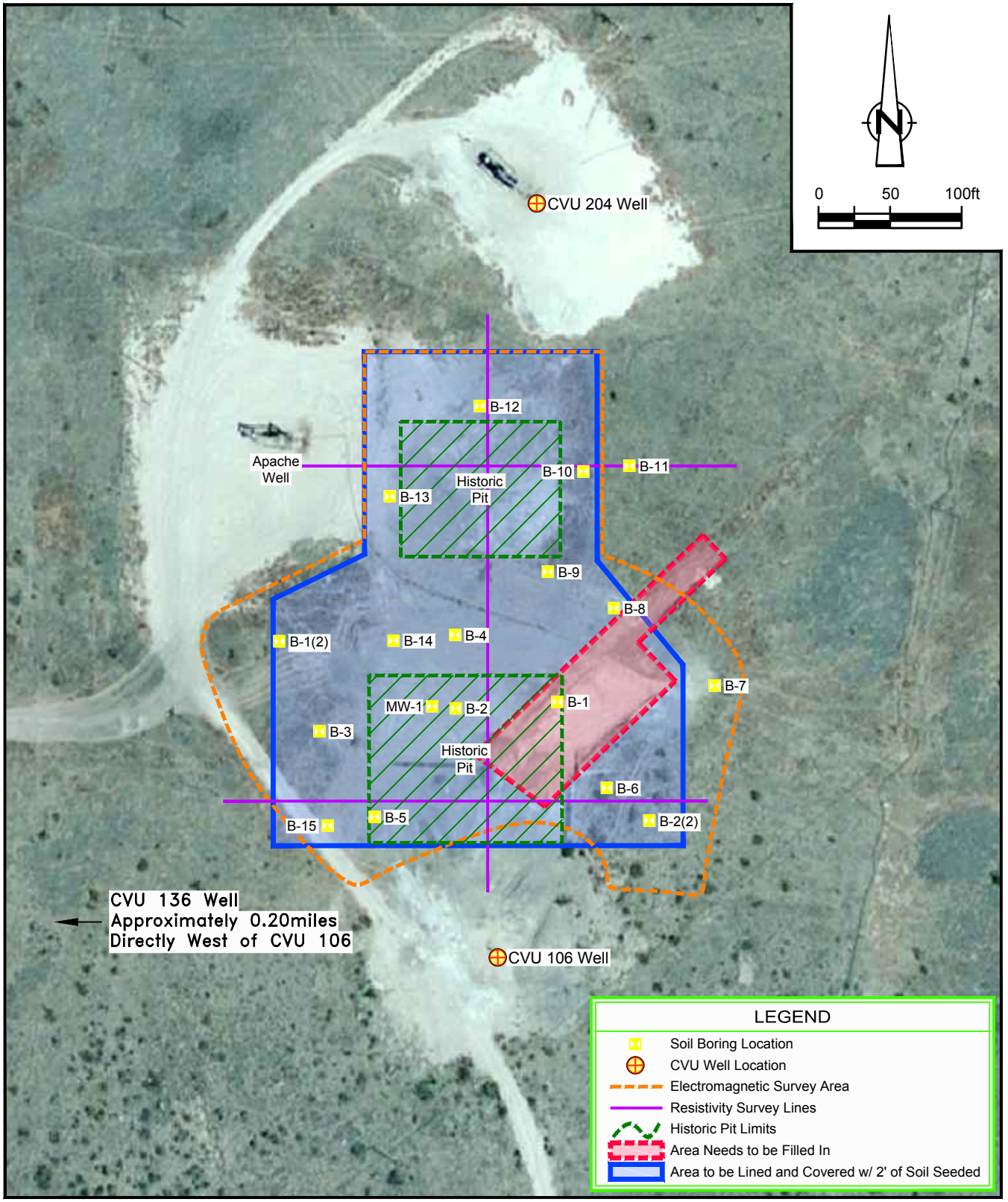


Figure 2

PROPOSED REMEDIATION ACTIVITY MAP
CVU No.136 AND CVU No.106
LEA COUNTY, NEW MEXICO
Chevron Environmental Management Company

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