



March 20, 2018

Reference No. 082150

Mr. Bradford Billings
Energy, Minerals, and Natural Resources Department
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Dear Mr. Billings:

**Re: A-7 Bettis, RP-1540/RP-2186
2018 Workplan
Lea County, New Mexico**

GHD Services Inc. (GHD) appreciates the opportunity to submit this work scope for the ETC Field Services (ETC), A-7 Bettis pipeline release site (hereafter referred to as the "Site"). The A-7 Bettis is a 10-inch (in) diameter natural gas pipeline located about 2.5 miles north of Eunice, New Mexico in Unit letter L, Sections 14 and 15, Township 21 South, Range 37 East of Lea County. Site coordinates are 32.475367° North, 103.142150° West (Figure 1).

The property at the pipeline release location is owned by Mr. Charlie Bettis of Eunice, New Mexico. The Site is regulated by the New Mexico Oil Conservation Division (NMOCD).

1. Project History

On August 22, 2007, Southern Union Gas Services, Ltd. discovered and verbally notified the NMOCD that failure of a section of 10-inch (in.) diameter low pressure natural gas pipeline resulted in a release of a mixture of crude oil, produced water, and natural gas. A rain shower that occurred shortly after the release increased the volume of fluids that were recovered. The "Release Notification and Corrective Action" (Form C-141) indicated a release of approximately 200 barrels of fluid. Approximately 130 barrels of fluid was recovered using a vacuum truck. Additionally, about 81 million cubic feet (MCF) of natural gas was also released.

On March 24, 2009, Form C-141 was approved by the NMOCD Hobbs District Office and assigned the NMOCD reference number 1RP-09-5-2186.

On February 26, 2009, horizontal delineation of the impacted area was conducted with the collection and analysis of 10 surface soil samples. Between March 12, 2009 and July 10, 2009 approximately 2550 cubic yards of impacted soil was excavated and stockpiled adjacent to the excavation and sampled for a disposal profile. The dimensions of the excavation were approximately 45 feet wide, 60 feet long, and up to 44 feet deep. Additional impacted soil remained in place but could not be removed due to safety considerations.



In October 2010, at the request of the NMOCD, five soil borings (SB-1 through SB-5) were advanced around the perimeter of the excavation to assess the lateral extent of the impacted soil. Soil Borings SB-1, SB-4, and SB-5 were converted into 2-in. diameter monitoring wells, MW-1, MW-2 and MW-3 (Figure 2), respectively, to investigate the potential impact to groundwater.

On October 29, 2012, the monitoring wells were sampled and with the exception of the sample collected from MW-1, the laboratory analytical results indicated benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations were below the method detection limit. TDS concentrations ranged from 777 mg/L to 2,620 mg/L for the samples collected from MW-3 and MW-1, respectively. Chloride concentrations ranged from 103 mg/L to 1,060 mg/L for the samples collected from MW-3 and MW-1, respectively.

On November 7, 2012, the excavation was partially backfilled and compacted with clean imported soil to a depth of 15 feet below ground surface (bgs). A 20-mil liner was installed on top of the backfilled soil to minimize the vertical migration of contaminants left in-situ. The remainder of the excavation was backfilled and compacted to 3 feet bgs, in preparation for the replacement of the damaged segment of pipeline.

Basin Environmental Services Technologies, LLC installed monitoring wells MW-4, MW-5, MW-6, and MW-7 on August 28, 2013 to delineate groundwater impacts (see Figure 2). Select soil samples were submitted for laboratory analysis of total petroleum hydrocarbons (TPH) and chlorides. The bottom sample collected from each borehole was submitted for laboratory analysis of BTEX in conjunction with TPH and chlorides. All of the samples submitted for laboratory analysis were below the NMOCD Recommended Remedial Action Limits (RRAL) for the Site.

Monitoring wells MW-8 and MW-9 appear to have been installed sometime during late 2014 or early 2015, presumably by Apex TITAN, Inc. collected groundwater samples on July 30, 2014, October 31, 2014, January 21, 2015, and April 21, 2015. The laboratory analytical results indicated that groundwater samples collected from monitoring wells MW-1, MW-6, MW-7, MW-8, and MW-9 contained benzene and/or chloride concentrations above the New Mexico Water Quality Control Commission (NMWQCC) Groundwater Quality Standards.

Two additional monitoring wells, MW-10 and MW-11 (see Figure 2), were installed by GHD in December 2015 in order to further delineate groundwater impacts in the cross-gradient and down-gradient directions. Laboratory analytical results indicated that MW-10 contained chloride at a concentration above the NMWQCC standard.

GHD installed O-Sox™ in monitoring wells MW-1, MW-6, MW-7, MW-8, and MW-9 on July 19, 2016. They were replaced on December 9, 2016. GHD performed groundwater sampling at the Site in May 2017 (MW-1, MW-2, and MW-6 through MW-11). During this sampling event, GHD personnel noted that the O-Sox™ had swollen and had become stuck in the wells. GHD was able to remove the O-Sox™ from the wells with some difficulty without damaging the wells. However, due to the possibility of damaging wells, GHD is proposing to discontinue the use of O-Sox™.

GHD performed groundwater sampling at the Site on May 9, 2017 (MW-1, MW-2, and MW-6 through MW-11) and on November 15, 2017 (MW-1 through MW-11). The samples were submitted to Hall



Environmental Analysis Laboratory (HEAL) for BTEX analysis by EPA Method 8260 and chlorides by EPA Method 300.0.

Groundwater collected from monitoring wells MW-2, MW-3, MW-4, and MW-5 have been below NMWQCC standards since sampling began. The 2017 laboratory analytical results indicated that groundwater samples collected from monitoring wells MW-1, MW-6, MW-8, MW-9, and MW-10 contained benzene and/or chloride concentrations above the NMWQCC Groundwater Quality Standards.

Groundwater collected from MW-1, MW-6, and MW-10 has consistently exceeded the NMWQCC standard for chlorides. During the most recent sampling event (November 2017) the concentration of chloride in Site wells ranged from 35 in MW-9 and MW-11 to 1,200 mg/L in MW-6. The NMWQCC standard for chloride is 250 mg/L.

2. Scope of Work

The scope of work for this project will involve project preparation, the continuation of semi-annual groundwater monitoring of Site monitoring wells MW-1, MW-2, MW-6, MW-7, MW-8, MW-9, MW-10, and MW-11. Wells MW-3, MW-4, and MW-5 will be included on an annual basis. Associated activities, results, and conclusions will be presented in an annual report. Details of each task to be completed in 2018 are presented below:

2.1 Project Preparation

This task includes preparing and submitting this work plan and other project preparation activities that occur after work plan approval, but before fieldwork mobilization. After receiving authorization to proceed, GHD will notify ETC a minimum of 48 hours prior to the commencement of field activities.

2.2 2018 Groundwater Monitoring

GHD proposes to perform semi-annual groundwater monitoring at the Site. An oil/water interface probe will be used to measure groundwater depths in each well and assess LNAPL thickness, if any. Before and after each use, the oil/water interface probe will be cleaned with an Alconox®/de-ionized water solution and rinsed with de-ionized water.

Monitoring wells will be purged and sampled using a low flow bladder pump or hand bailed using dedicated, disposable polyethylene bailers. Wells will be purged until field parameters including groundwater temperature, pH, and conductivity stabilize to within 10 percent or until three well volumes have been removed. Field parameters will be collected using an appropriate multi-parameter groundwater quality meter. The wells to be sampled on a semi-annual basis will include monitoring wells MW-1, MW-2, MW-6, MW-7, MW-8, MW-9, MW-10, and MW-11. Monitoring wells MW-3, MW-4, and MW-5 will be sampled on an annual basis in conjunction with one of the semi-annual events. These wells have not exceeded the NMWQCC standard for target constituents since sampling began. Purge water generated during the monitoring events will be transported to the House Compressor Station for disposal.



Following collection, groundwater samples will be labeled, placed on ice, and submitted to HEAL for analyses of chloride by EPA Method 300.0 and BTEX by EPA Method 8260.

GHD will discontinue the use of the O-Sox™ in Site monitoring wells due to the possibility of damaged wells from the swelling of O-Sox™.

An annual report summarizing groundwater sampling activities will be prepared. The report will be provided as a draft to ETC. Following inclusion of ETC's comments, the report will be submitted to the NMOCD. The report will include a Site description, project history, description of field events, appropriate maps, tabulation of field and analytical data, and a discussion of results and recommendations.

3. Schedule

GHD is submitting this work plan to the NMOCD for their review following approval by ETC. Field work will be scheduled pending ETC approval.

GHD appreciates the opportunity to assist in the management, assessment and closure of the A-7 Bettis release site. Please feel free to contact either of us at 505-884-0672 if you have questions or comments.

Sincerely,

GHD

A handwritten signature in blue ink that reads "Alan Brandon".

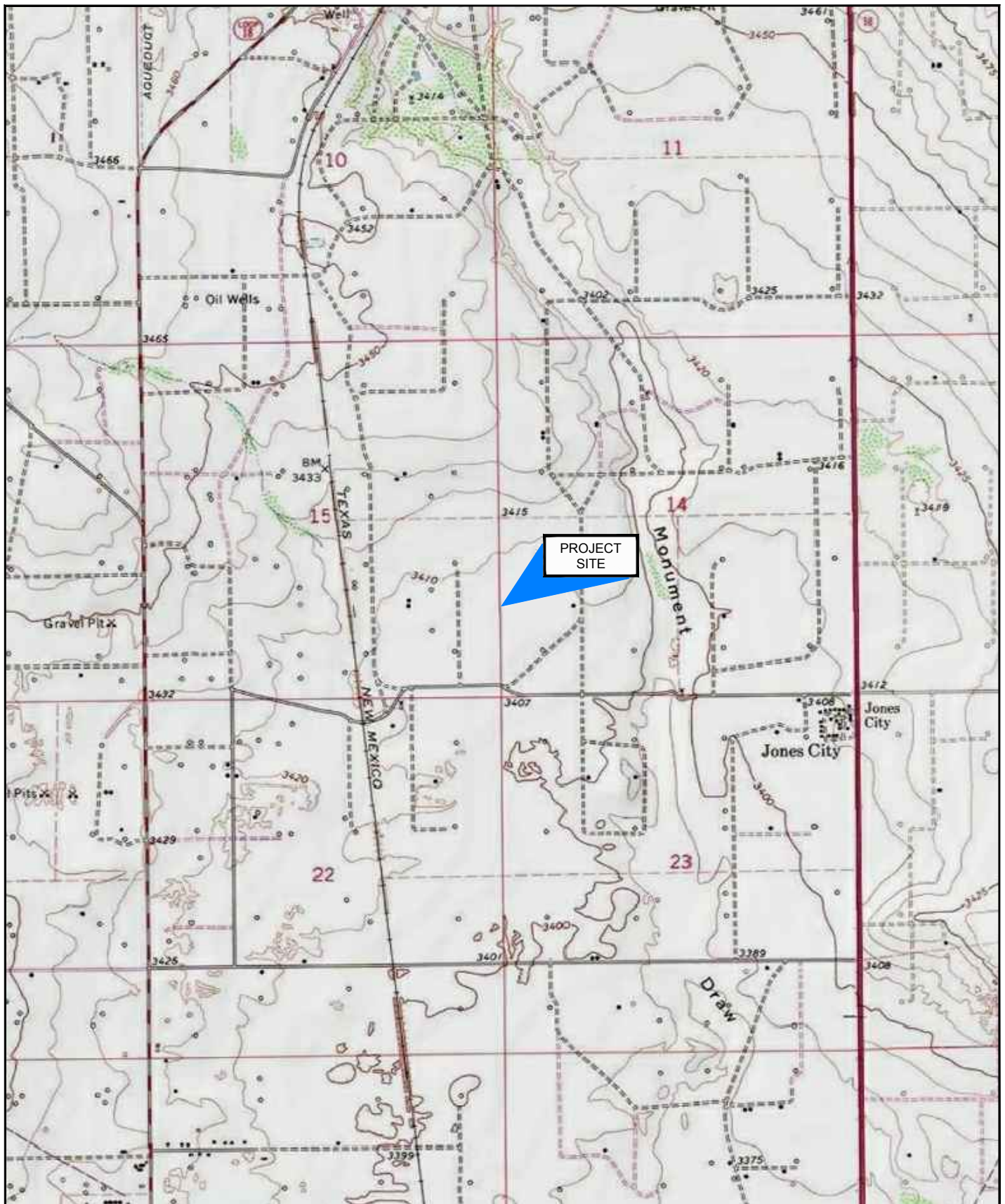
Alan Brandon
Senior Project Manager

AB/md/1

Encl.

A handwritten signature in blue ink that reads "Bernard Bockisch".

Bernard Bockisch, PMP
Senior Project Manager



Source: USGS 7.5 Minute Quad "Eunie and Eunie NE, New Mexico"

Lat/Long: 32.47536° North, 103.14215° West

0 1000 2000ft

Coordinate System:
NAD 83 (2011) State Plane-
New Mexico East (US Feet)



ETC FIELD SERVICES LLC
LEA COUNTY, NEW MEXICO
A-7 BETTIS PIPELINE

SITE LOCATION MAP

082150-2017

Feb 28, 2018

FIGURE 1



Source: NAIP Imagery, New Mexico 2014 Lat/Long: 32.47536° North, 103.14215° West

02060ft

Coordinate System:
NAD 83 (2011) State Plane-
New Mexico East (US Feet)

ETC FIELD SERVICES LLC
LEA COUNTY, NEW MEXICO
A-7 BETTIS PIPELINE

SITE PLAN

082150-2017
Feb 28, 2018

FIGURE 2