June 26, 2017 Reference No. 081773

Mr. Randolph Bayliss, P.E.
District III Hydrologist
Oil Conservation Division
Energy, Minerals, & Natural Resources
1220 South St. Francis Dr., Santa Fe, NM 87505

Dear Mr. Bayliss:

Re: Delineation and NAPL Recovery Work Plan
State Com J6
NMOCD Site #3RP-468
San Juan County, New Mexico

On behalf of ConocoPhillips Company (ConocoPhillips), GHD Services, Inc. (GHD) is pleased to present this work plan to further delineate subsurface impacts and continue with product recovery at the above referenced site (the Site). Submittal of this work plan is in response to your letter, dated May 25, 2017. The Site is located in the southwest quarter of Section 36, Township 31N, Range 9W in the middle of the Pump Canyon wash. The New Mexico State Land Office is the surface owner at this Site.

Project Information

Immediately after the March 2013 pipeline release, ConocoPhillips removed 275 cubic yards of impacted soil and 60 barrels of hydrocarbon-impacted groundwater from the resulting excavation for offsite disposal. GHD (Conestoga Rovers and Associates at the time) subsequently conducted a soil and groundwater assessment at the Site in July 2013, after the initial remedial action by ConocoPhillips. Depth to groundwater during excavation was noted to be approximately 5 feet below ground surface (ft bgs).

During the assessment, GHD advanced 26 hand-auger boreholes in and around the ephemeral wash, in the vicinity of the release, to delineate the extent of impacted soils and the presence of non-aqueous phase liquids (NAPL, see Figure 1). Field headspace readings were collected using a photoionization detector and confirmation laboratory soil samples were submitted for analyses of total petroleum hydrocarbons (TPH) and BTEX) constituents (benzene, toluene, ethylbenzene and xylenes). The attached Table 1 summarizes the field screening and laboratory results of the 2013 release assessment. Approximately 3 inches of NAPL were measured on top of the groundwater in boring B-11, near the low flow channel of the wash. This was the only one of 26 hand auger borings to encounter NAPL.

Figure 1 and Table 1, depicting hand auger locations and screening/sampling results from the 2013 delineation, have not previously been presented in a report, but these results were discussed in the 2014 Groundwater Monitoring and Remediation Report (CRA, February 2015). The data were also used to generate work plans for subsequent installation of groundwater/NAPL recovery wells and extraction events.

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REGISTERED COMPANY FOR ISO 9001 ENGINEERING DESIGN

Four, 4-inch diameter recovery wells were installed at the location where NAPL was encountered (B-11, Figure 1) during the 2013 site assessment. These wells were used to recover NAPL during three MDPE and three vacuum truck recovery events that have been performed at the site.

During the recently completed June 2017 quarterly groundwater monitoring event, NAPL was measured in only one of the recovery wells, RW-1 (0.25' thick). This is the first instance of NAPL in this well since its installation in May 2014. During periods between MDPE events, Pig® absorbent socks were used in the four wells to recover NAPL. GHD believes that further assessment of NAPL in the subsurface at the Site is not necessary based on the following:

- Relatively quick initial NAPL delineation.
- Significant mass removal through hydrovac/MDPE events and absorbent socks.
- Diminishing levels of NAPL observed in Site recovery wells.
- The distribution of dissolved-phase BTEX concentrations.

In addition to achieving significant mass removal, the MDPE/vacuum truck removal events have served to significantly reduce dissolved phase BTEX concentrations in groundwater down-gradient of the source area. This is based on the following:

- Concentrations of BTEX in down gradient monitor well MW-1 have ranged from just above to below the New Mexico Water Quality Commission Standard since this well was installed and first sampled in May 2014.
- Groundwater sampled from monitor well MW-2 (located down gradient of the source area depending on seasonal fluctuations in flow direction) has not detected concentrations of BTEX constituents above laboratory detection limits since its installation.
- Groundwater from monitor well MW-3, located cross-gradient, to the west, has similarly not detected any BTEX constituents in three successive quarterly events.

Based on this information, GHD believes assessment of the BTEX plume to the south and west of the release area is sufficient.

GHD proposes therefore to collect groundwater quality samples north and east of the source to further assess these areas. GHD also proposes to conduct at least one additional MDPE event to further remediate NAPL found in Site recovery wells.

1. Scope of Work

1.1 Dissolved-Phase Plume Delineation

GHD believes that it is unlikely that dissolved-phase impacts exist upgradient and cross gradient to the east of the source area based on:

- Historical groundwater quality data from existing monitor wells.
- Mass removal quantities to date.
- The shallow, sandy and highly oxygenated aquifer characteristics.

To demonstrate this assertion, and to fulfill the NMOCD request to complete benzene plume delineation, GHD proposes to collect groundwater samples north and east of the source area using a hand driven Geoprobe® sampling device. Sample points will be located in or adjacent to the low flow channel of the wash, and east, along the piping leading to the State Com J6 wellhead.

A hand-driven Geoprobe® sampling unit will be used to insert a screened rod into the water table. A groundwater sample will be collected via peristaltic pump using ¼ inch diameter polyethylene tubing. The steel-screened section will be decontaminated prior to each use using an Alconox and distilled water rinse. Groundwater samples from each point will be collected into laboratory provided glass containers, preserved on ice and shipped to Pace Laboratory under chain of custody protocol. Samples will be analyzed for BTEX constituents by EPA Method 8260. The depth to groundwater will be measured using an oil/water interface probe. Field parameters, including temperature, pH, and conductivity will be recorded.

GHD is recommending to use this method instead of installing permanent monitor wells due to the location of the site in a designated wetland habitat. Collection of groundwater samples using this method will minimize damage to the wetland and preclude additional permitting to comply with Section 401 and 404 Clean Water Act requirements. The Geoprobe® sampling method is being used successfully on another pipeline release site, located in a similar ephemeral stream (wash) environment in the San Juan basin. The method can be repeated for successive events and can be used to install a more permanent sample point, if needed.

1.2 Mobile Dual Phase Extraction

The use of MDPE combines the use of groundwater pumping and soil vapor extraction. The induced hydraulic gradient and groundwater depression that results from pumping exposes the capillary fringe allowing for the remobilization and capture of NAPL while extracting hydrocarbon vapors that were previously inaccessible.

A MDPE event is typically performed for 8 hours on wells that may contain NAPL or high dissolved-phase concentrations. Based on a review of data, GHD recommends three successive 8-hour MDPE events be performed, focusing on the recovery well containing NAPL, and utilizing multiple recovery wells, as necessary and as determined by field conditions.

Necessary permitting for the withdrawal of non-consumptive use of groundwater will be secured through the New Mexico Office of the State Engineer.

1.3 Reporting

A summary report will include a map showing the location of the groundwater sample collection points, an MDPE event summary, copies of laboratory chain-of-custody documentation and results, laboratory quality assurance/quality control (QA/QC) documentation and a summary of findings.

Schedule

GHD is prepared to initiate the scope of work immediately, subsequent to requisite approvals, the availability of resources and stakeholder concurrence. A start date and schedule of report submittals will be provided following receipt of MDPE contractor availability.

If you have any questions or comments with regards to this work plan, please do not hesitate to contact GHDs Albuquerque office at (505) 884-0672.

Sincerely,

GHD

Jeffrey Walker, CPG, PMP
Sr. Project Manager

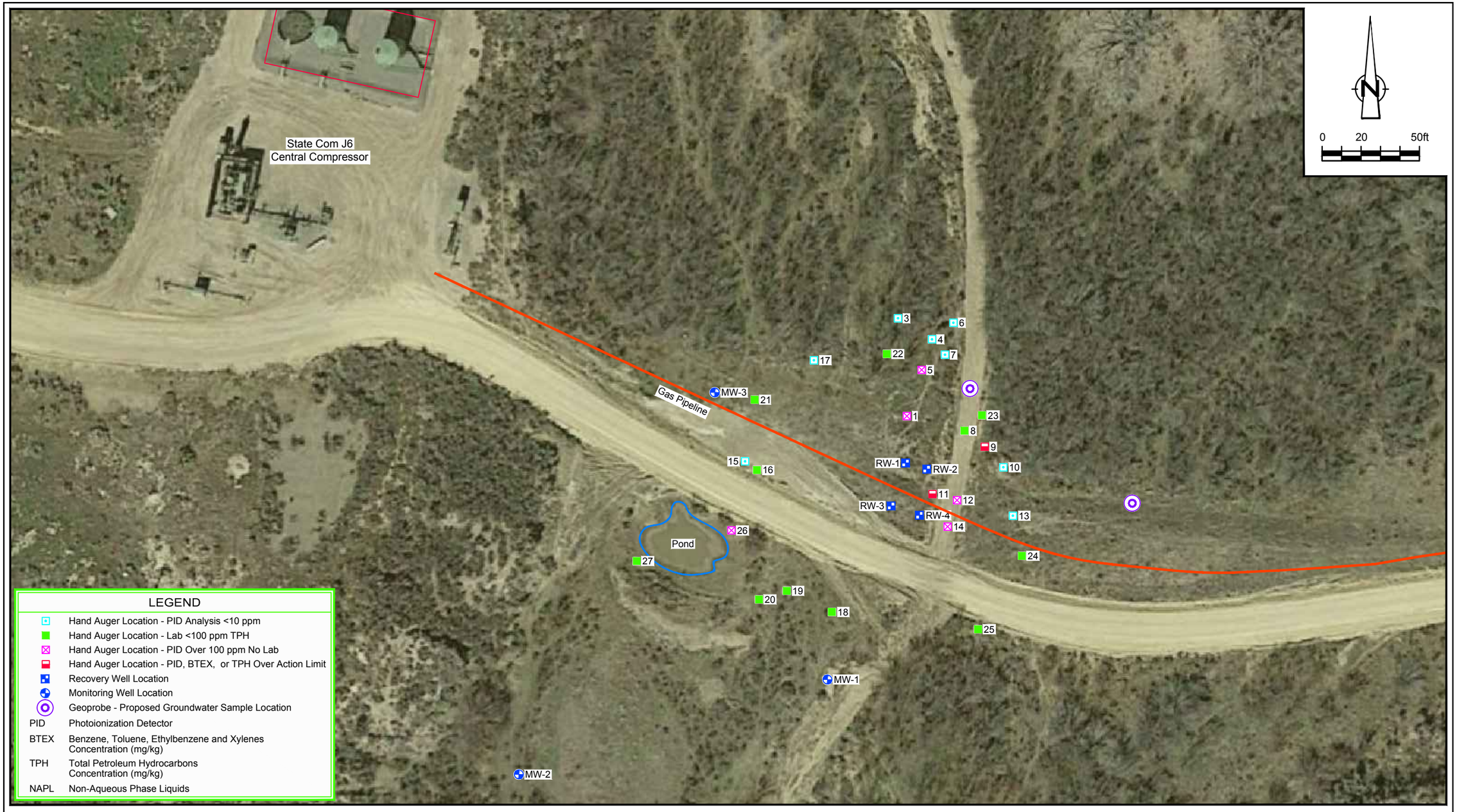
Bernard Bockisch, PMP
New Mexico Area Manager

JW/mc/01

Encl. (2)

- Figure 1 – 2013 NAPL Delineation Hand Auger Locations
- Table 1 – Laboratory Soil Analytical Results Summary

cc: Gwen Frost – ConocoPhillips Company



Source: Image © 2016 Google - Image Date: March 16, 2016.

Figure 1

2013 NAPL DELINEATION HAND AUGER LOCATION
STATE COM J6
SECTION 36, T31N, R9W, SAN JUAN COUNTY, NEW MEXICO
ConocoPhillips Company

GHD

081773-00(MISC)GN-DL001 JUN 6, 2017

TABLE 1
Laboratory Soil Analytical Results Summary
ConocoPhillips Company State Com J6

Sample Name	Date	Headspace (ppm)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX	TPH DRO (mg/kg)	TPH GRO (mg/kg)	Total TPH (mg/kg)
B-1 @ 6'	7/9/2013	**1812**	NA	NA	NA	NA	--	NA	NA	--
B-2 @ 7'	7/9/2013	<1.0	NA	NA	NA	NA	--	NA	NA	--
B-3 @ 5'	7/9/2013	<1.0	NA	NA	NA	NA	--	NA	NA	--
B-4 @ 5'	7/9/2013	<1.0	NA	NA	NA	NA	--	NA	NA	--
B-5 @ 6'	7/9/2013	**416**	NA	NA	NA	NA	--	NA	NA	--
B-6 @ 6'	7/9/2013	<1.0	NA	NA	NA	NA	--	NA	NA	--
B-7 @6'	7/9/2013	4.0	NA	NA	NA	NA	--	NA	NA	--
B-8 @ 5'	7/9/2013	24	<0.0059	<0.0059	<0.0059	<0.0117	--	< 11.6	< 11.6	--
B-9 @ 4.5'	7/9/2013	**1234**	< 0.284	< 0.284	< 0.284	7.89	7.89	1260	571	**1831**
B-10 @ 5.5'	7/9/2013	<1.0	NA	NA	NA	NA	--	NA	NA	--
B-11 @ 6'	7/10/2013	**1616**	**18.3**	221	53.3	917	**1209.6**	6630	3980	**10610**
B-12 @ 5'	7/10/2013	**1582**	NA	NA	NA	NA	--	NA	NA	--
B-13 @ 6'	7/10/2013	5.3	NA	NA	NA	NA	--	NA	NA	--
B-14 @ 3'	7/10/2013	**1375**	NA	NA	NA	NA	--	NA	NA	--
B-15 @ 6'	7/10/2013	< 10.0	NA	NA	NA	NA	--	NA	NA	--
B-16 @ 6'	7/10/2013	<1.0	<0.0058	<0.0058	<0.0058	<0 .0116	--	< 11.7	< 11.5	--
B-17 @ 6'	7/11/2013	<10.0	NA	NA	NA	NA	--	NA	NA	--
B-18 @ 6'	7/11/2013	5.7	<0.0059	<0.0059	<0.0059	<0.0118	--	64.3	< 11.9	64.3
B-19 @ 6'	7/11/2013	1.7	< 0.0055	< 0.0055	< 0.0055	<0.011	--	19.5	< 11.2	19.5
B-20 @ 6'	7/11/2013	31.2	< 0.0079	< 0.0079	< 0.0079	<0.0157	--	80.3	<15.8	80.3
B-21 @ 6'	7/11/2013	21	<0.0059	<0.0059	<0.0059	<0.0117	--	<11.7	<11.6	--
B-22 @ 6'	7/11/2013	<1.0	<0.0059	<0.0059	<0.0059	<0.0118	--	<12.0	<12.0	--
B-23 @ 6'	7/11/2013	<1.0	<0.0058	<0.0058	<0.0058	<0 .0115	--	<11.5	<11.3	--
B-24 @ 6'	7/11/2013	<1.0	<0.0059	<0.0059	<0.0059	<0.0119	--	<11.8	<11.9	--
B-25 @ 6'	7/11/2013	25.6	<0.0058	<0.0058	<0.0058	<0 .0116	--	<11.7	<11.6	--
B-26 @ 6'	7/12/2013	--	**11.9**	32.9	160	481	**685.8**	4100	104	**4204**
B-27 @ 6'	7/12/2013	--	< 0.0081	< 0.0081	< 0.0081	< 0.0162	--	56.6	<16.0	56.6
NMOCD Action Limits		**100**	**10 mg/kg**	**NE**	**NE**	**NE**	**50 mg/kg**	**NE**	**NE**	**Total TPH = 100 mg/kg**

Notes:
B = Soil Boring
NMOCD = New Mexico Oil Conservation Division
BOLD = Exceeds NMWQCC Action Limits
mg/kg = milligrams per kilogramliter (parts per million)
NA = Not Analyzed
NE = Not Established
TPH DRO = total petroleum hydrocarbons diesel range organics