COMPLIANCE / ENGINEERING / REMEDIATION

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March 16, 2016

Jim Griswold
Environmental Bureau Chief
EMNRD/Oil Conservation Division
1220 South Street Francis Drive
Santa Fe, New Mexico 87505

RE: Revised Action Plan for Groundwater Investigation
Hare Gas Com F #1 Natural Gas Production Well
OCD Case# 3R-1036
Bloomfield, New Mexico

Dear Mr. Griswold:

LT Environmental, Inc. (LTE), on behalf of XTO Energy, Inc. (XTO), presents the following revised work plan to the New Mexico Oil Conservation Division (NMOCD) to conduct a supplementary investigation of groundwater at the Hare GC F #1 natural gas production well located in Unit G of Section 23 in Township 29 North, Range 11 West of San Juan County, New Mexico. XTO will advance three additional boreholes and install three groundwater monitoring wells to obtain additional groundwater data downgradient of the former excavation from which impacted soil was excavated following the removal of a below-grade tank. The purpose of the additional data will be to delineate impacted groundwater identified in a temporary monitoring well installed by XTO at the request of the New Mexico Oil Conservation Division (NMOCD) for consideration of risk-based closure.

Background

While removing a below-grade tank as part of plugging and abandonment operations, XTO identified impacted soil. XTO excavated approximately 3,870 cubic yards during two excavation events, moving south until the sidewall of the excavation reached private property. To avoid destruction of structures and mature trees, XTO advanced eighteen boreholes to direct additional excavation and delineate soil impact. The boreholes that were located outside of the final excavation extent are depicted on Figure 1. Soil sampling results from the southern and eastern excavation sidewalls and downgradient boreholes indicated total petroleum hydrocarbons (TPH) concentrations exceeding the recommended remediation action levels specified in the NMOCD's 1993 *Guidelines for Remediation of Leaks, Spills and Releases* were present in the vadose zone soil however, XTO requested to leave remaining impacted soil in place after demonstrating that groundwater sampled downgradient and beneath the excavation were not impacted in excess of the New Mexico Water Quality Control Commission (NMWQCC) standard for benzene, toluene, ethylbenzene, and total xylenes (BTEX). Figure 2 depicts soil and groundwater sampling locations.

As part of consideration of the risk-based closure request, the NMOCD requested more specific groundwater data to better characterize remaining elevated soil TPH concentrations by analyzing downgradient groundwater for volatile organic compounds via United States Environmental Protection (EPA) Method 8260. Previous groundwater and soil samples had been analyzed for

BTEX by EPA Method 8021. XTO installed temporary monitoring well TMW-1. As confirmed by multiple sampling events, laboratory analytical results of EPA Method 8260 indicated groundwater in temporary monitoring well TMW-1 exceeded the NMWQCC standard for benzene. As such, XTO will delineate potential downgradient and cross-gradient impact to groundwater.

Scope of Work

XTO proposes to delineate potential downgradient and cross-gradient impact to groundwater by installing temporary monitoring wells in the locations presented in Figure 2. Well placement is generally downgradient of defined impact, but adjusted to be near existing structures at the request of the landowner. Downgradient flow direction is an estimation based on groundwater elevation data from former monitoring wells located on a closed groundwater site adjacent to the Hare Gas Com F#1.

The temporary monitoring wells will be installed utilizing a hand auger to a depth of 3 feet below the interface of the vadose zone and saturated zone and constructed of 2-inch polyvinyl chloride (PVC) with a 5-foot screened interval straddling the interface. The annulus will be backfilled with silica sand to 2 feet above the screened interval with hydrated bentonite chips extending from the silica sand to ground surface.

Following the installation, the monitoring wells will be developed utilizing clean, disposable PVC bailers. A minimum of 10 saturated well casing volumes of water will be removed while monitoring pH, specific conductivity, and temperature until these parameters stabilized and turbidity is reduced to the greatest extent possible or the monitoring well is bailed dry. Following the development of the temporary monitoring wells there will be a 24-hour period prior to sampling to allow groundwater conditions to equilibrate.

Prior to sampling groundwater, depth to groundwater and total depth of monitoring wells will be measured and a minimum of three well casing volumes of water will be purged. As water is removed, pH, electric conductivity, and temperature will be monitored. Monitoring wells will be purged until these properties stabilize or until the well is dry. Groundwater samples will be collected by filling 40-milliliter (mL) glass vials capped with zero headspace to prevent degradation of the sample. Samples will be labeled and immediately placed on ice. The chilled samples will be shipped under proper chain-of-custody procedures to ESC of Mount Juliet, Tennessee, for analysis of volatile organic compounds by EPA Method 8260.

The temporary monitoring wells will be surveyed with a Trimble® GeoExplorer® 3000 series Global Positioning System (GPS) to determine the latitude and longitude. Top-of-casing elevations will be surveyed to an accuracy of no less than plus or minus (±) 0.01 feet so that groundwater flow direction and gradient can be determined.

Within 2 weeks of receipt of the laboratory results, XTO will provide a report to the NMOCD documenting field procedures, results, groundwater gradient, and flow direction. If laboratory analytical results indicate groundwater is in compliance with the NMWQCC standards, XTO will plug and abandoned the temporary monitoring wells with the exception of TMW-1. Sampling of TMW-1 and any other monitoring well containing concentrations of BTEX exceeding NMWQCC standards will continue until analytical results from 8 consecutive quarters indicate

groundwater is below NMWQCC standards at which time XTO will plug and abandon TMW-1. Prior to any field work being conducted notification will be given to the NMOCD district office.

If you have any questions or comments regarding this proposed work plan, please do not hesitate to contact me at (970) 385-1096 or via email at aager@ltenv.com.

Sincerely,
LT ENVIRONMENTAL, INC.

Ashley L. Ager

Ashley L. Ager, M.S.
Senior Geologist

Attachments (2)

FIGURES

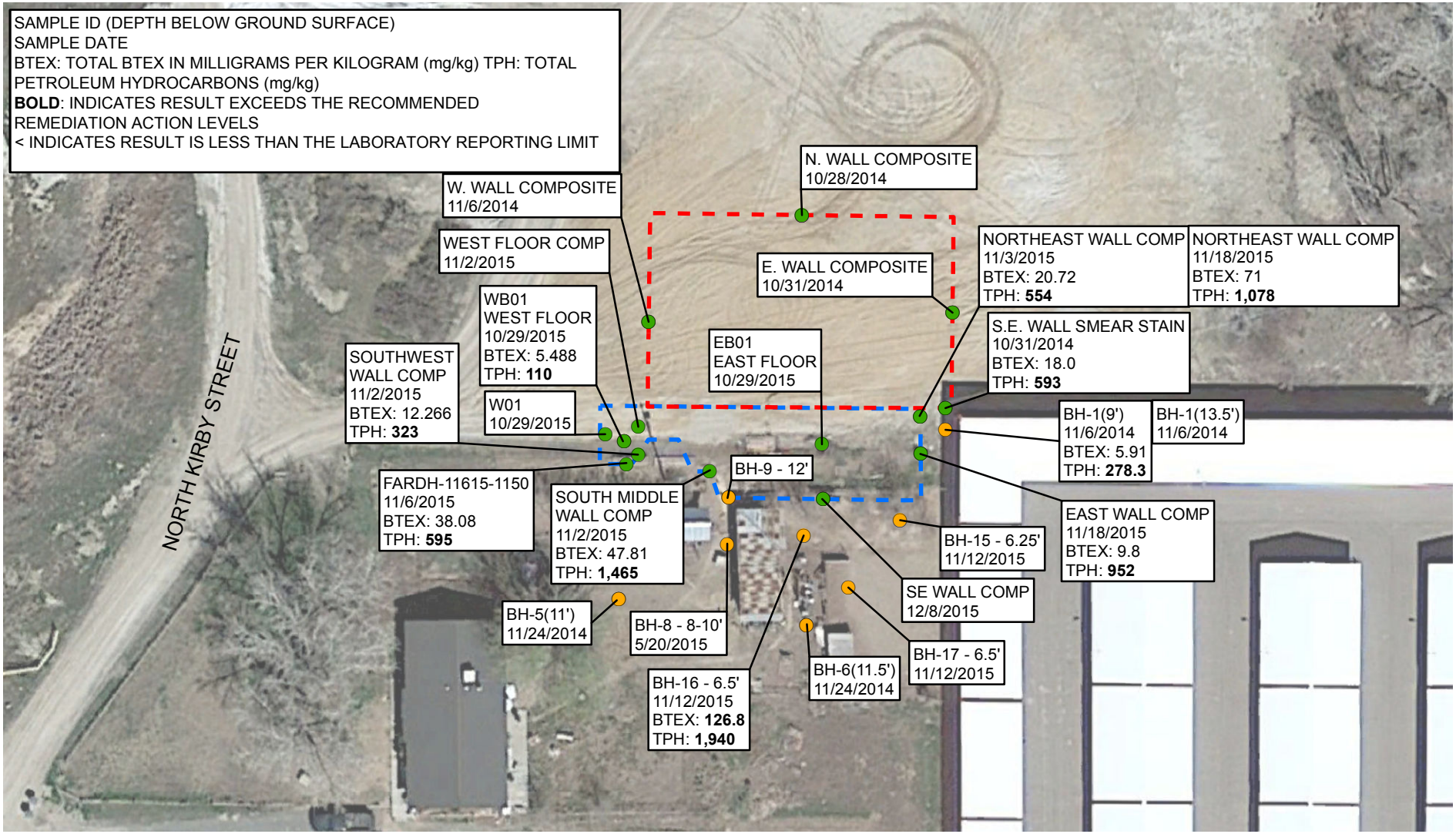

IMAGE COURTESY OF GOOGLE EARTH, 3/15/15

LEGEND

- BOREHOLE
- EXCAVATION SAMPLE
- EXCAVATION EXTENT
- ADDITIONAL EXCAVATION EXTENT

0 50 100
Feet

N

NOTE: ONLY ANALYTICAL RESULTS EXCEEDING RECOMMENDED REMEDIATION ACTION LEVELS SPECIFIED IN THE NMOCD,s 1993 *Guidlines for Remediation of Spills and Releases* ARE PRESENTED. SAMPLES WITHOUT LABORATORY ANALYTICAL RESULTS WERE BELOW THE RECOMMENDED REMEDIATION ACTION LEVELS SPECIFIED IN THE NMOCD,s 1993 *Guidlines for Remediation of Spills and Releases.*

FIGURE 1
SOIL SAMPLE RESULTS
HARE GC F #1
SAN JUAN COUNTY, NEW MEXICO

XTO ENERGY, INC.

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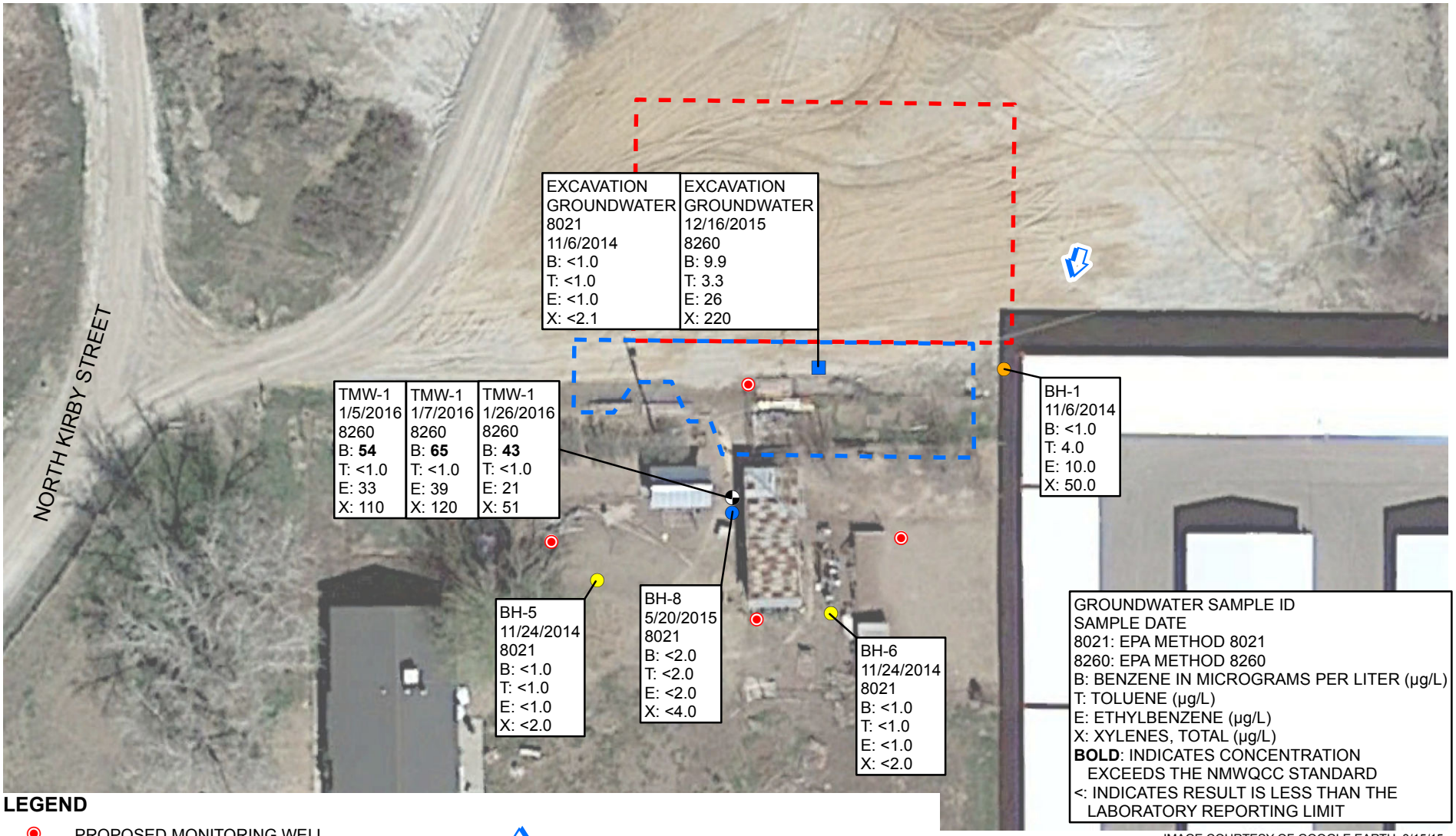

IMAGE COURTESY OF GOOGLE EARTH, 3/15/15

LEGEND

- PROPOSED MONITORING WELL
- BOREHOLE (INSTALLED 11/6/2014)
- TEMPORARY MONITORING WELL
- BOREHOLE (INSTALLED 11/24/2014)
- BOREHOLE (INSTALLED 5/20/2015)
- EXCAVATION GROUNDWATER (SAMPLED 11/6/2015)
- ESTIMATED GROUNDWATER FLOW DIRECTION BASED ON EXISTING DATA FROM HARE GC B #1
- EXCAVATION EXTENT
- ADDITIONAL EXCAVATION EXTENT

0 40 80
Feet

N

FIGURE 2
GROUNDWATER SAMPLE RESULTS
HARE GC F #1
SAN JUAN COUNTY, NEW MEXICO

XTO ENERGY, INC.

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