

RECEIVED*By Alameda County Environmental Health at 2:52 pm, Jan 16, 2014*Project No.
7828.000.001

January 15, 2014

Mr. Jerry Wickham
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502-6577

Subject: Jordan Ranch – Parcel H (Case # R00002918)
Dublin, California

WORKPLAN FOR SOIL GAS WELL INSTALLATION AND SAMPLING

Reference: Alameda County Environmental Health Services, Case File Review for SLIC Case No. RO0002918 and GeoTracker Global ID T06019797353, Jordan Ranch, 4233 Fallon Road, Dublin, CA 94568, December 5, 2013

Dear Mr. Wickham:

On behalf of BJP-ROF Jordan Ranch, LLC, we prepared this workplan to assess potential soil gas impacts at the former underground storage tank (UST) site located within the Jordan Ranch Property (Figure 1). The purpose of the soil gas assessment is to supplement existing soil gas data to evaluate potential vapor intrusion concerns for proposed residential units to be constructed within the former UST area.

BACKGROUND

There are currently no structures within the former UST area. Soil and groundwater remediation was implemented in 2011, which resulted in the removal of vadose zone soil impacts and a significant reduction in concentrations of petroleum hydrocarbons in groundwater.

Based on the current conceptual site model, residual soil impacts remain in the saturated zone deeper than 14 feet bgs and groundwater concentrations still exceed the established cleanup goals. Development plans are currently being prepared which would include high-density residential units within the impacted area (Figure 2). Since groundwater supply wells will not be utilized by the proposed development, and remaining soil impacts are deeper than 14 feet bgs, we have identified vapor intrusion as the only potential exposure pathway for residential receptors.

Four permanent soil gas wells are located in the former UST area. The soil gas wells were sampled in June 2012, October 2012, and February 2013. During all three sampling events, constituents were not detected above the residential environmental screening levels (ESLs) listed in Table E-2 published by the Regional Water Quality Control Board, San Francisco Region (SFRWQCB) and the residential California Human Health Screening Levels (CHHSLs) published by Department of Toxic Substances Control (DTSC); with the exception of one detection of benzene at 94 ug/m³.

SOIL GAS WELL INSTALLATION AND SAMPLING

Two permanent soil gas monitoring wells will be installed to supplement the existing four wells. One well will be installed south of the UST basin between borings NG-2 and B-25 and the second well will be installed west of the former dispenser adjacent to B-7 (Figure 2). All six soil gas monitoring wells will be installed and sampled using the following methodology:

- The installation and sampling of the soil gas monitoring wells will be performed in accordance with the *Department of Toxic Substances Control (DTSC) Final Advisory Active Soil Gas Investigations (April 2012)*. The soil gas monitoring well casings will be constructed with ¼-inch diameter Teflon tubing equipped with a filter at the base of the tubing. The well installations will be performed with a direct push probe rig, which will advance an approximately 3-inch diameter boring to a depth of 7 feet bgs. Two soil samples will be collected from each boring between 0 and 5 feet bgs. The soil samples will be analyzed for volatile organic compounds (VOCs) by EPA Test Method 8260B and polyaromatic hydrocarbons (PAHs) by EPA Test Method 8310. For each well, the bottom of the well casing will be equipped with a 1-inch long filter situated at a depth of 6 feet bgs, centered in the middle of a 2 foot layer of No. 3 sand. The two foot long sand pack, which is allowed by DTSC, is designed to provide adequate flow in the potentially low permeability geology found at the site. Six inches of dry bentonite will be installed on top of the sand, and the remaining annular space will be filled with hydrated bentonite grout to six inches below grade. The wells will be completed with an eight inch diameter flush mount well box set in concrete. The well casings will extend an additional 2.5 feet beyond the ground surface so that it can be directly connected to the sample train. When not in use, the well casing will be coiled and sealed with a threaded plug inside the well box. The well construction diagram is included as Figure 3.
- Once the installation of the annular seal is complete, we will connect a permanent Swagelok® fitting on the top of the well casing and a threaded plug will be inserted. At this point, the mandatory two hour equilibration time will commence.
- After the two hour equilibration time has elapsed, we will connect the sample manifold to the well casing. The sample train, which will consist of a stainless steel summa and manifold with built in flow controller set to 100-200 ml/min, will be encompassed in a helium shroud provided by McCampbell Analytical. The sample train is shown here: <http://www.youtube.com/watch?v=pXsOquN8Rw8#t=91>
- A purge vacuum pump will be attached to the manifold and a shut in test will be performed to assess for potential leaks. The shut in test will consist of capping the end of the manifold, then applying a vacuum with the vacuum pump, closing the purge valve, and observing the vacuum gauge for two minutes to determine if there is a drop in vacuum.
- We will purge three well casing volumes of soil gas from each well prior to sampling at flow rate of 150 ml/minute. The purge specifications are presented in the following Table:

TABLE 1

Casing Length (ft)	Casing Volume Per Foot (ml)	Total Casing Volume (ml)	Sand Pack Pore Volume (ml) (50% Porosity)	Total Well Volume (ml)	Minutes (1x)	Minutes (3x)	Minutes (10x)
9.5	5	47.5	1,390	1437.5	9.6	28.7	95.8

Notes: Purge minutes are based on a flowrate of 150 ml/min
 Sandpack is 3" diameter by 2 feet in length

- After purging is completed, a 20% helium content will be established in the shroud and confirmed with a field meter prior to sampling. Once the 20% helium content is established, samples will be collected by opening the sample canister valve and allowing the sample canister to extract soil gas until the vacuum in the sample canister reaches approximately 5 inches of mercury.
- We will label each sample canister with a unique identification number, sampling time, pre and post sample vacuum readings; and the six soil gas samples will be submitted to a State certified laboratory for analysis of TPHg and volatile organic compounds (VOCs) by EPA Test Method TO-17.

REPORTING

Following completion of the proposed field activities, a summary report, including all analytical results, will be prepared and provided in a letter report and submitted electronically to ACWD. As appropriate, all reports and analytical data will be electronically uploaded to the California State Water Resources Control Board (SWRCB) GeoTracker website. The report will include a vapor intrusion risk evaluation and the proposed frequency for additional soil gas sampling events, if necessary.

RESPONSE TO TECHNICAL COMMENTS

The December 5, 2013 letter from ACEH included technical comments and a request for ENGEO to address the technical comments in the workplan provided herein. Our responses to the technical comments are provided below:

Comment 1: The groundwater well installation data and monitoring results are included in the Fourth Quarter 2013 Groundwater Monitoring Report, which was submitted to ACEH on January 8, 2014.

Comment 2: At the start of the remedial excavation, the upper 5 feet of soil (~200 yd³) was screened with a photoionization detector (PID) and segregated into a discrete stockpile. We collected two four-point composite samples from the stockpile and based on the laboratory results, the stockpile was deemed non-impacted. As the excavation progressed, we noted the first staining at a depth of 7 feet bgs. The soil that was excavated from 5 to 25 feet bgs (~450 yd³) was placed in the treatment cell. Thus, the total excavation volume was ~650 yd³. Bioaugmentation was performed on the treatment cell and two of the confirmation samples exhibited TPH concentrations above the cleanup goals. The two sample locations were excavated and approximately 28 yd³ (42 tons) was transported to Hay Road Landfill. The

remaining portion of the treatment cell meets unrestricted land use criteria and was left in place. This information is documented in the Addendum to Soil and Groundwater Remediation Status Report dated May 22, 2013. The excavation was backfilled with approximately 350 yd³ of drain, the 200 yd³ of that was removed and profiled from the upper 5 feet, and 100 yd³ of clean fill dirt obtained from pasture land on the greater Jordan Ranch Property outside of Parcel H.

Comment 3: The upper eight feet of borings B-1 through B-11 were not logged because the investigation was focused on the saturated zone. During the remedial investigation, sidewall samples collected at 8 feet bgs exhibited no impacts. We did note staining remaining in the sidewalls between depths of 14 to 25 feet bgs, which was the focus of boring B-1 through B-11. Limited soil impacts were noted in borings B-9 and B-10 at depths of 9 and 13 feet bgs. Boring B-10 was screened with a PID beginning at the ground surface, and no shallow impacts were noted. The limited impacts are delineated by lab data collected from borings B-8 and B-12, B-N, BN-A, B-S, BS-A (screened continuously with PID from the ground surface). Additionally, laboratory analysis was performed on a shallow sample collected at 4.5 feet bgs from NG-2, which exhibited no impacts.


Comments 4 and 5: ACEH requested a new soil gas well between B-25 and NG-2. Existing soil gas well SG-2 is located approximately 20 feet from this location. Nonetheless, we will proceed with installing a new soil gas well at this location and near B-7.


Comment 6: A table of the well screen intervals for all wells at the site is provided on GeoTracker: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T06019797353


If you have any questions regarding this workplan, please do not hesitate to contact us.

Sincerely,

ENGEO Incorporated

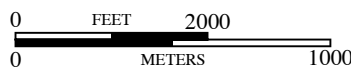
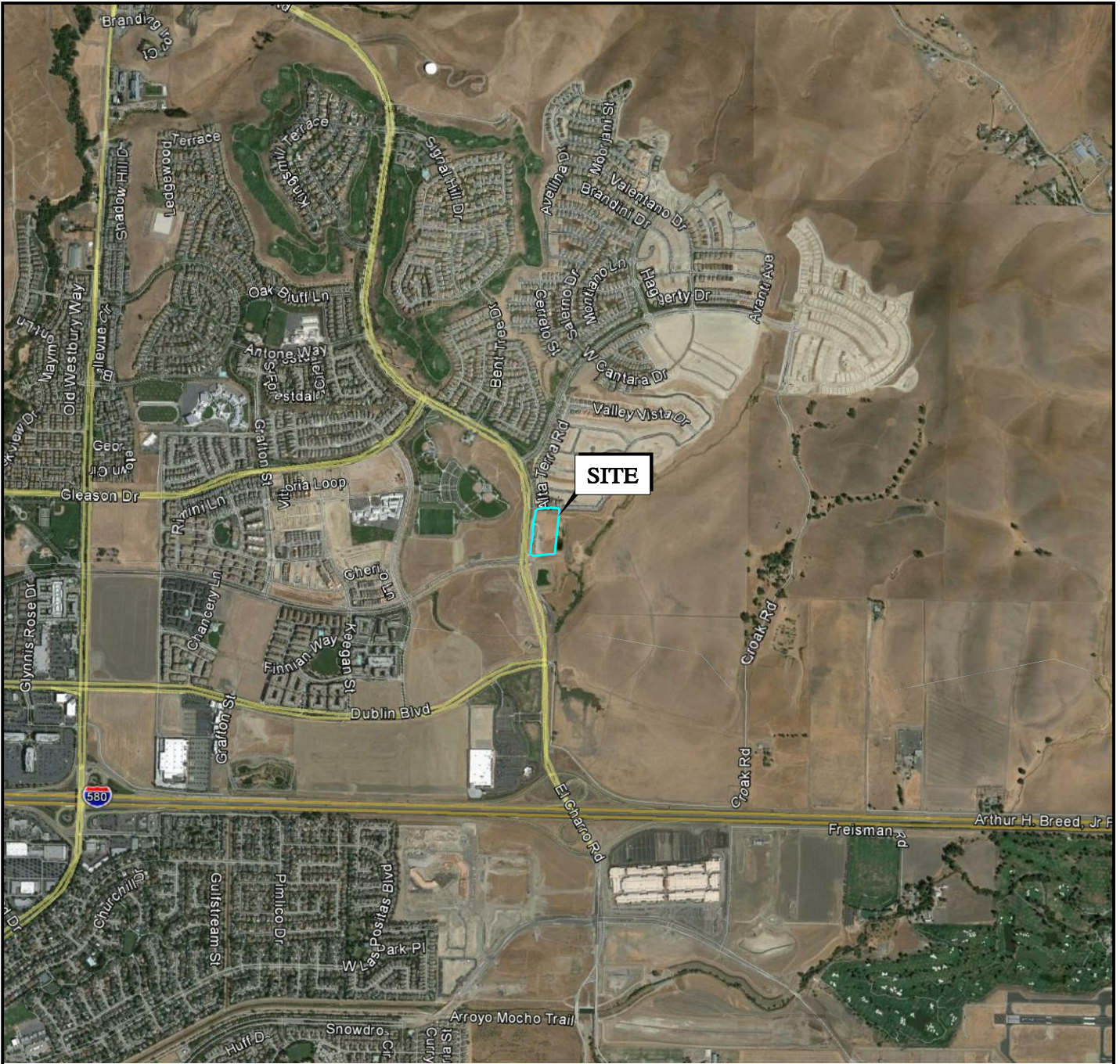

Morgan Johnson
Environmental Scientist


Shawn Munger, CHG
Principal



Attachments: Figure 1 – Site Vicinity Map
Figure 2 – Proposed Soil Gas Well Locations
Figure 3 – Soil Gas Well Construction Diagram

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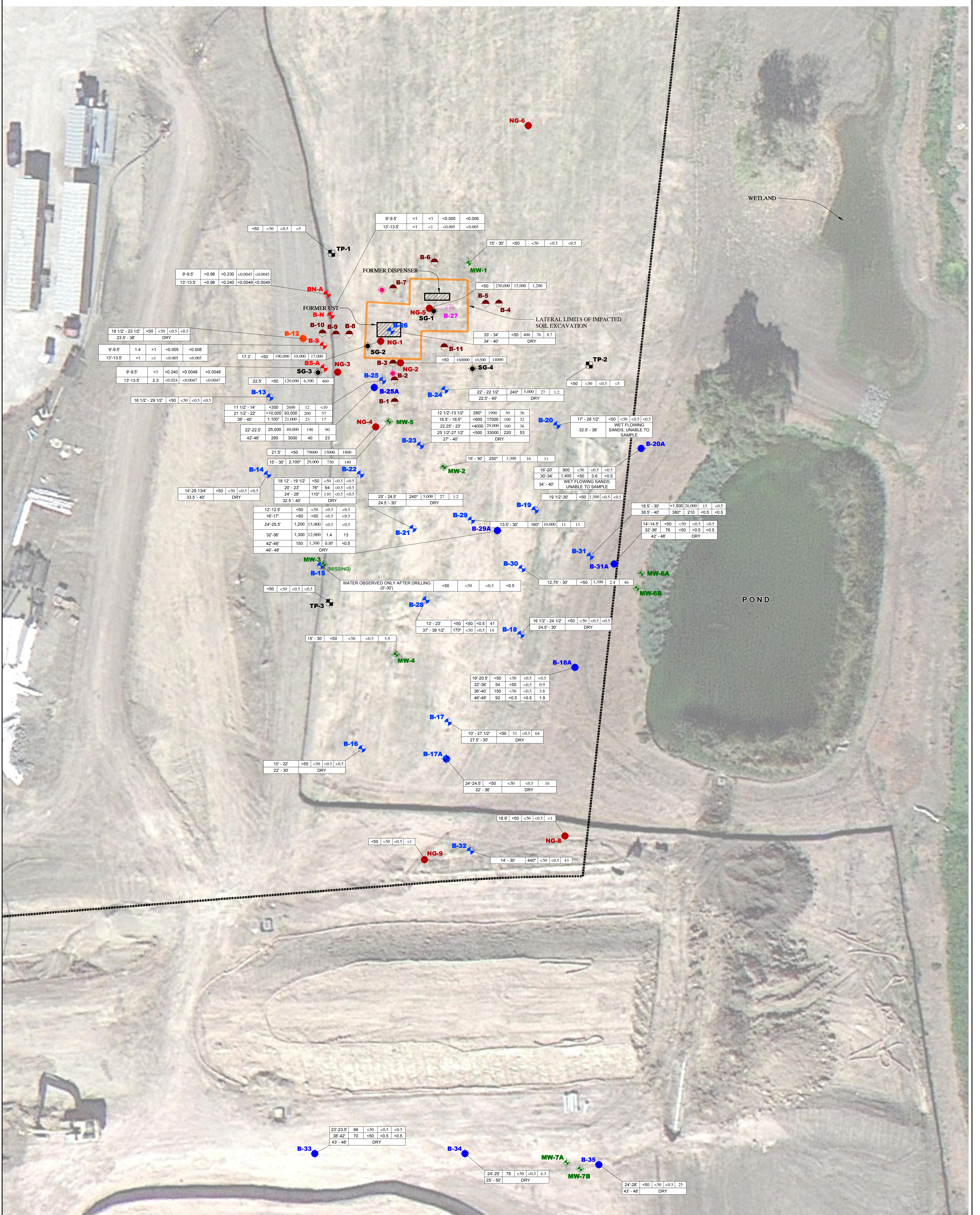


BASE MAP SOURCE: GOOGLE EARTH



VICINITY MAP
 JORDAN RANCH - PARCEL H
 DUBLIN, CALIFORNIA

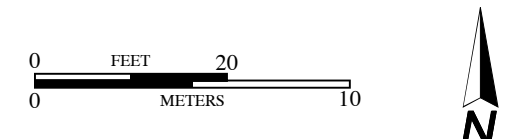
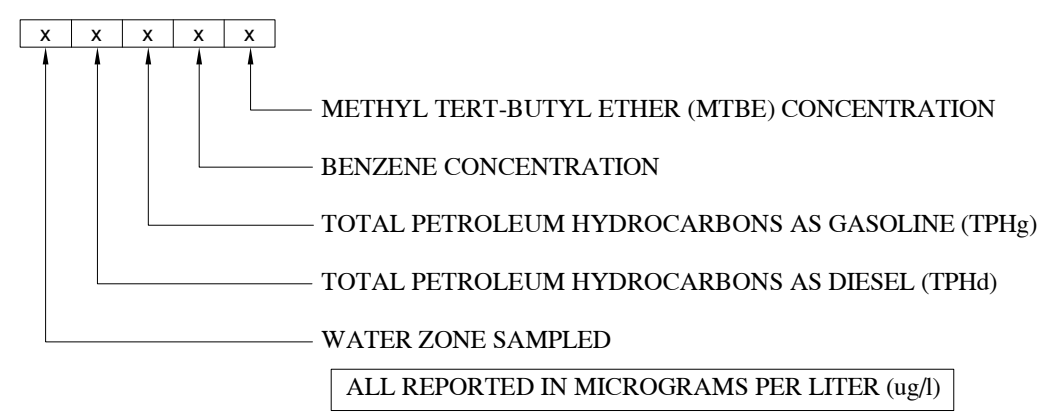
PROJECT NO.: 7828.000.001	FIGURE NO. 1
DATE: AS SHOWN	
DRAWN BY: SRP CHECKED BY: SM	



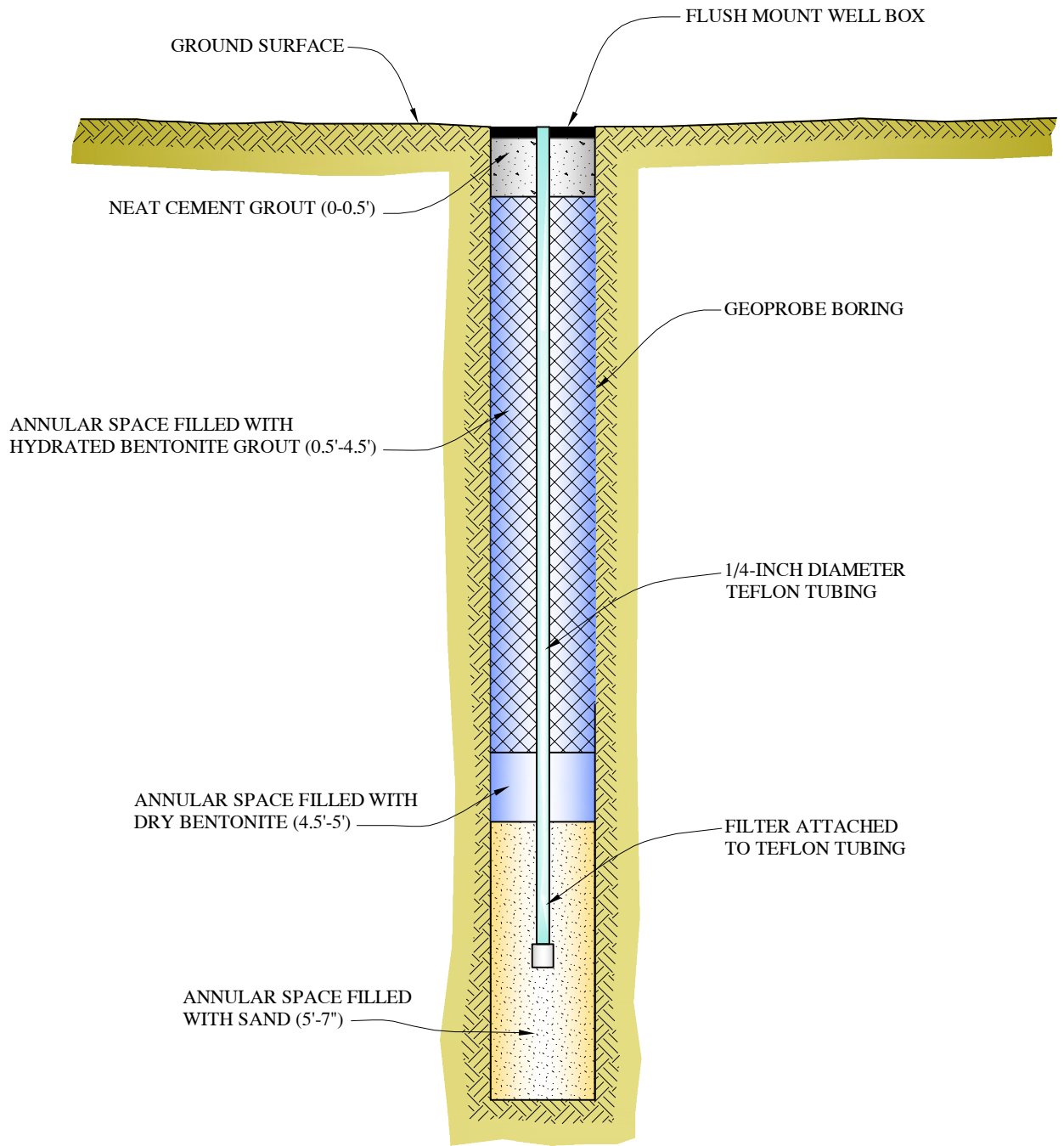
EXPLANATION

- APPROXIMATE LOCATION OF PROPOSED SOIL GAS WELL
- **BS-A** APPROXIMATE LOCATION OF GRAB SOIL SAMPLE (REPORTED IN (mg/kg) (ENGE0, 9-2013)
- **MW-7B** APPROXIMATE LOCATION OF PROPOSED MONITORING WELL
- **B-35** APPROXIMATE LOCATION OF GRAB GROUNDWATER SAMPLE (ENGE0, 9-2013)
- **MW-5** APPROXIMATE LOCATION OF MONITORING WELL (OCTOBER 2012)
- **NG-5** APPROXIMATE LOCATION OF GRAB GROUNDWATER SAMPLE (NEM, 2006)
- **TP-3** APPROXIMATE LOCATION OF GRAB GROUNDWATER SAMPLE (ICES, 2006)
- **B-11** APPROXIMATE LOCATION OF SOIL BORING FOR SOIL SAMPLING AND PID SCREENING (ENGE0, 2012)
- **B-12** APPROXIMATE LOCATION OF SOIL AND GRAB GROUNDWATER SAMPLE (ENGE0 2012/2013)
- **B-32** APPROXIMATE LOCATION OF GRAB GROUNDWATER SAMPLE SURVEYED WITH GPS (ENGE0 2012/2013)
- **B-27** APPROXIMATE LOCATION OF SOIL SAMPLE ONLY (ENGE0 2012/2013)
- **SG-4** APPROXIMATE LOCATION OF SOIL GAS WELL

* NOTE FOR DIESEL DETECTIONS: MULTIPLE LABORATORIES REPORTED QUALIFIERS FOR THE TPHd DETECTIONS, STATING THEY ARE REPRESENTATIVE OF A WEATHERED GASOLINE FRACTION AND ARE NOT CONSISTENT WITH THE TYPICAL DIESEL CHROMATOGRAM



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SOIL GAS WELL CONSTRUCTION DIAGRAM
 JORDAN RANCH - PARCEL H
 DUBLIN, CALIFORNIA

PROJECT NO.: 7828.000.001	
SCALE: NO SCALE	
DRAWN BY: PC	CHECKED BY: SM

FIGURE NO
3

January 15, 2014

Subject: Jordan Ranch Property – Former Leaking Underground Storage Tank
Dublin, California

PERJURY STATEMENT

“I declare, that to the best of my knowledge at the present time, the information and/or recommendations contained in the attached document are true and correct.”

Submitted by Responsible Party:



ROBERT RADANOVICH
BJP-ROF Jordan Ranch, LLC
5000 Hopyard Road, #170
Pleasanton, CA 94588