Project No.
7828.000.001

June 13, 2012

Dilan Roe
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502-6577

Subject: Jordan Ranch Property (Case # R00002918)
Dublin, California

WORKPLAN FOR SOIL GAS ASSESSMENT

References: Department of Toxic Substances Control (DTSC), Final Advisory Active Soil Gas Investigations, April 2012

Dear Ms. Roe:

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 evaluate potential vapor intrusion concerns for proposed apartment complex to be constructed within the former UST area. A lot line adjustment has recently been recorded, creating a new Parcel H (4.6acres), which encompasses the former UST location and the proposed apartment development (Figure 2)

BACKGROUND

There are currently no structures within the former UST area. Soil and groundwater remediation was implemented in 2011, which resulted in the complete removal of vadose zone soil impacts shallower than 14 feet below ground surface (bgs), 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. We are currently evaluating additional remedial alternatives to expedite the timeframe for achieving the cleanup goals. Development plans are currently being prepared which would include 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. Therefore, we propose to conduct a soil gas assessment to evaluate the potential vapor intrusion concerns associated with a residential land use.

SOIL GAS WELL INSTALLATION

A total of four permanent soil gas monitoring wells will be installed within the footprint of the proposed residential buildings that would occupy the area overlying the soil and groundwater impacts (Figure 2). A key area of study includes the backfilled UST excavation. The UST excavation was backfilled with class II drain rock from 11 to 25 feet bgs. From 0 to 11 feet bgs,

the excavation was backfilled with soil with a relative compaction of 90%. Two of the proposed soil gas wells are located within the UST backfill, and the remaining two soil gas monitoring wells are located outside of the former UST excavation. The soil gas monitoring wells will be installed 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 consist of ¼-inch diameter Teflon tubing equipped with a filter at the base of the tubing. The wells will be installed with a direct push probe rig, which will advance an approximately 3-inch diameter boring. The well borings will extend to a depth of 7 feet bgs. The bottom of the well casing will be equipped with a filter and will be situated at a depth of 6 feet bgs, centered in the middle of a 2 foot layer of No. 3 sand. The proposed two foot long sand pack, which is allowed by DTSC, is designed to provide adequate flow in the 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 casing will extend an additional 2 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 capped inside the well box. The well construction diagram is included as Figure 3.

- Once the installation of the annular seal is complete, the well casings will be equipped with a permanent Swagelok® ferrule and nut. A threaded plug will then be screwed into the nut and the mandetory two hour equilibriation time will begin.

SOIL GAS SAMPLING

After the two hour equilibriation time has elapsed, we will collect soil gas samples from the four wells. The soil gas sampling and purging will be performed using the following methodology:

- The sample train will consist of a stainless steel twin summa manifold with built in flow controller set to 100-200 ml/min. A purge vacuum pump will be attached to the manifold connection that is closest to the well casing and the sampling canister will be connected to the manifold fitting furthest away from the well casing. Prior to connecting the sample train to the well casing, we will perform a shut in test to assess for potential leaks. The shut in test will consist of capping the end of the manifold, then cracking and closing the purge casinster to apply a vacuum. We will observe the vacuum gauge for two minutes to determine if there is a leak.

- The sample train will casing by threading the permanent Swagelok® fitting on the well casing onto the manifold. During the initial sampling event, we will perform a step purge to determine which purge volume yields the greatest concentrations. We identified SG-2 as being the well location that is in the area with the greatest soil and groundwater impacts, therefore we have selected this well for the step purge test. Samples will be collected from SG-2 after purging one, three, and ten well volumes. Three well volumes will be purged from the remaining wells. The purge specifications are presented in the following Table:

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, the purge valve on the manifold will be closed, and the vacuum pump can be removed and connected to the another well if desired. 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. The leak detection compound 1,1-Diflouroethane will be applied by wrapping a doused rag around the manifold fittings during sample collection. The soil gas sample train diagram is attached as Figure 4.

- 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 volatile organic compounds (VOCs), including TPH-g and naphthalene, by EPA Test Method TO-15.

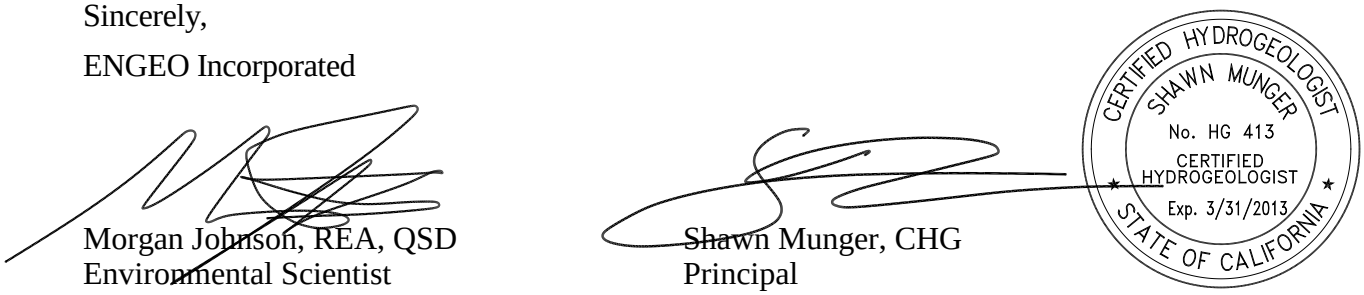
REPORTING

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 ACEH. 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.

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

Sincerely,

ENGEO Incorporated

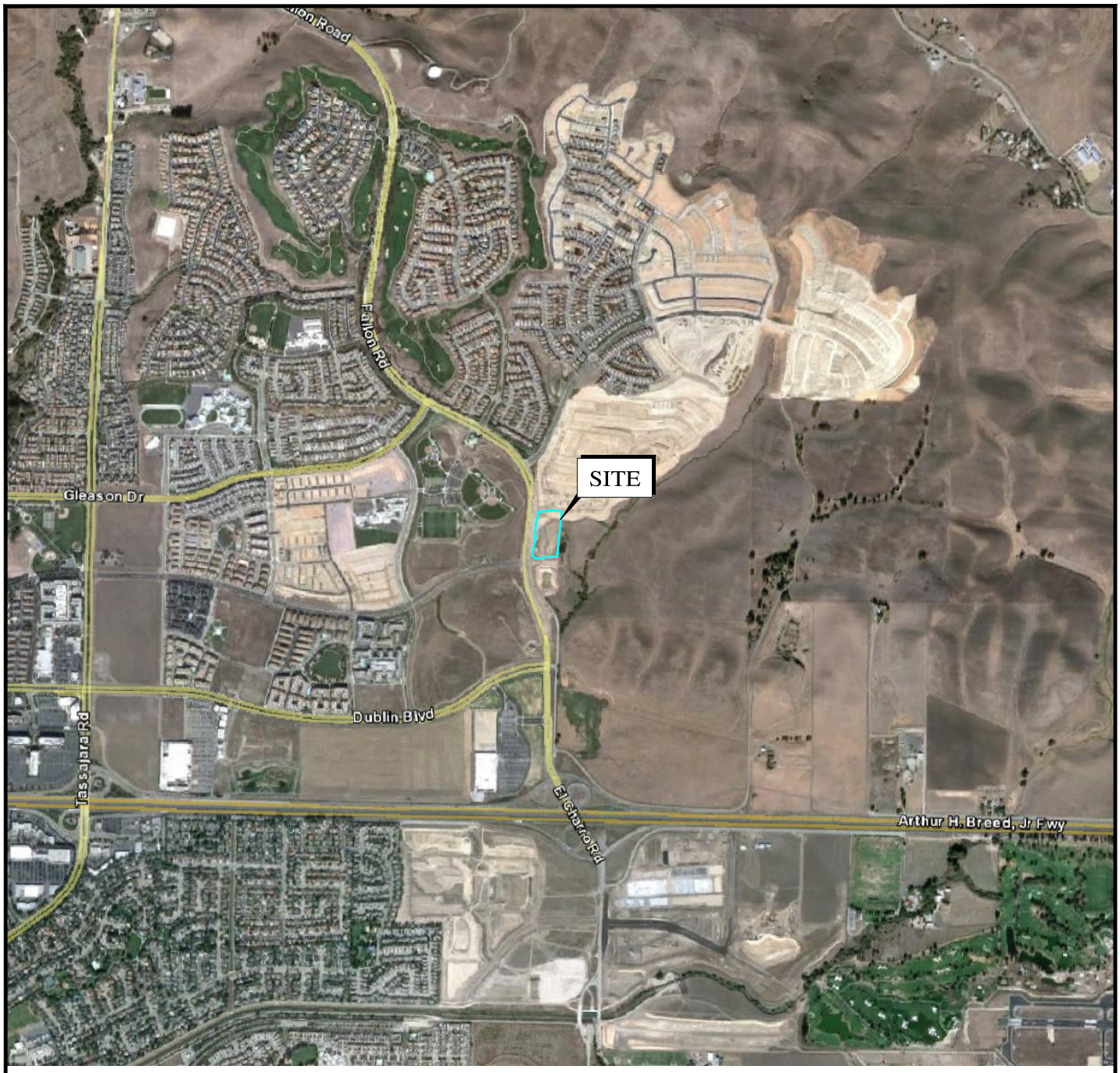


Morgan Johnson, REA, QSD
Environmental Scientist

Shawn Munger, CHG
Principal

Attachments: Figure 1 – Site Vicinity Map
Figure 2 – Development Plan
Figure 3 – Site Plan
Figure 4 – Soil Gas Well Construction Diagram
Figure 5 – Soil Gas Sample Train Diagram

Copies: Mr. Ravi Nandwana, BJP-ROF Jordan Ranch, LLC
Mr. Kevin Fryer, BJP-ROF Jordan Ranch, LLC



N

0 FEET 2000

0 METERS 1000

BASE MAP SOURCE: GOOGLE EARTH

ENGEO Expect Excellence

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	

C:\Documents and Settings\dborde\local settings\temp\AcPublish_3528\7828000001-ParcelH-1-VicinityMap-0612.dwg 6-12-12 03:29:43 PM dborde

ORIGINAL FIGURE PRINTED IN COLOR

JORDAN RANCH DR

FALLON ROAD

CENTRAL PARKWAY

Club Room (Proposed)

Pool (Proposed)

MW-1

MW-2

MW-3 (MISSING)

MW-4

MW-5

LATERAL LIMITS OF IMPACTED SOIL EXCAVATION

PARCEL H

EXPLANATION

MW-5 APPROXIMATE LOCATION OF MONITORING WELL

N

0 FEET 60

0 METERS 30

BASE MAP SOURCE: ST. ANTON

ENGEO Expect Excellence

DEVELOPMENT PLAN

JORDAN RANCH - PARCEL H

DUBLIN, CALIFORNIA

PROJECT NO.: 7828.000.001

SCALE: AS SHOWN

DRAWN BY: DLB CHECKED BY: SM

FIGURE NO. 2

ORIGINAL FIGURE PRINTED IN COLOR

EXPLANATION

- MW-5 — APPROXIMATE LOCATION OF MONITORING WELL
- SG-4 — APPROXIMATE LOCATION OF PROPOSED SOIL GAS WELL
- APPROXIMATE LOCATION OF PREVIOUS INJECTION POINT
- FLOW — GROUNDWATER FLOW DIRECTION

N

0 FEET 40
0 METERS 20

BASE MAP SOURCE: GOOGLE EARTH, ST. ANTON

ENGEO — Expect Excellence

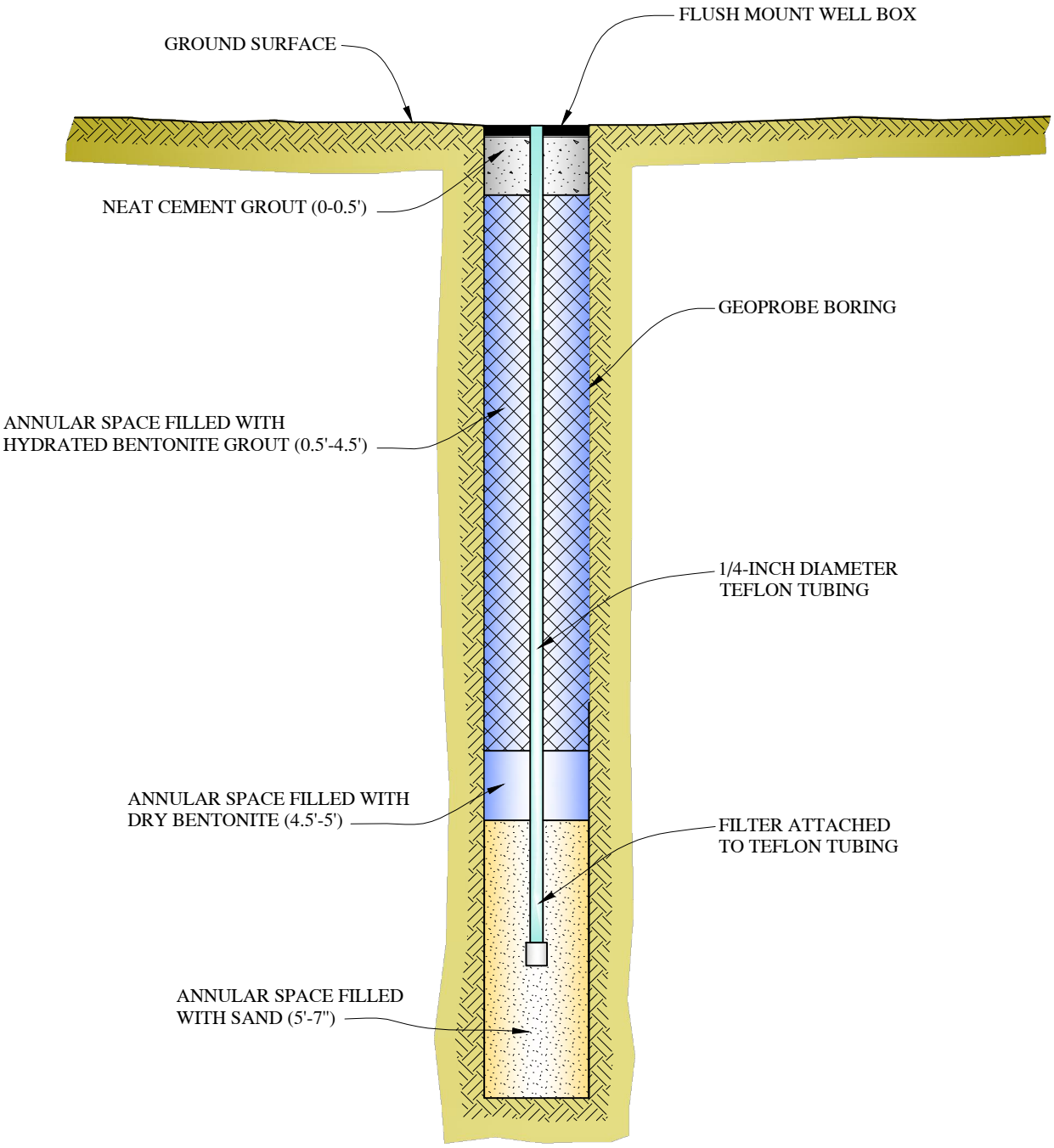
SITE PLAN
JORDAN RANCH - PARCEL H
DUBLIN, CALIFORNIA

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

FIGURE NO. 3

C:\Documents and Settings\dborde\local settings\temp\AcPublish_1036\7828000001-ParcelH-3-SitePlan-DevOL-0612.dwg Plot Date: 6-13-12 dborde

ORIGINAL FIGURE PRINTED IN COLOR



ENGEO Expect Excellence

SOIL GAS WELL CONSTRUCTION DIAGRAM

JORDAN RANCH - PARCEL H

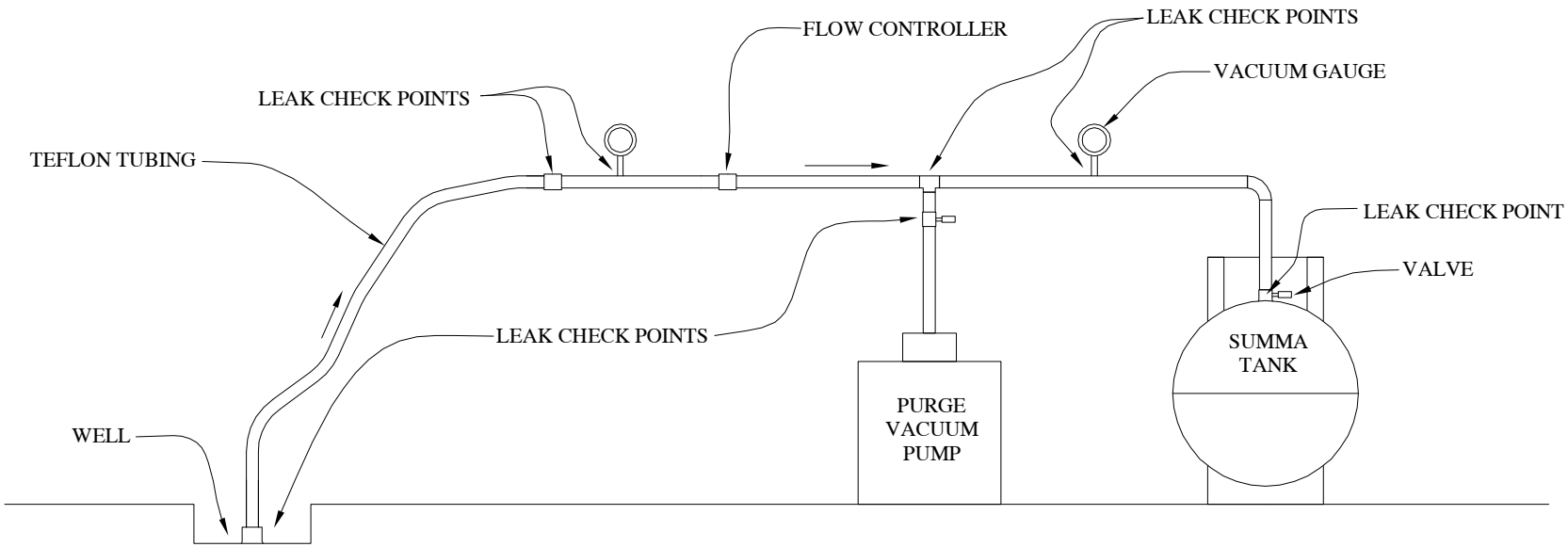
DUBLIN, CALIFORNIA

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

FIGURE NO. 4

C:\Documents and Settings\dborde\local settings\temp\AcPublish_3528\7828000001-ParcelH-4-SoilGasWellConstDia-0612.dwg 6-12-12 03:09:56 PM

ORIGINAL FIGURE PRINTED IN COLOR



ENGEO Expect Excellence

SOIL GAS SAMPLE TRAIN

JORDAN RANCH - PARCEL H

DUBLIN, CALIFORNIA

PROJECT NO.: 7828.000.001	FIGURE NO. 5
SCALE: NO SCALE	
DRAWN BY: PC	CHECKED BY: SM

ORIGINAL FIGURE PRINTED IN COLOR

June 13, 2012

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