

# Atlantic Richfield Company

**Chuck Carmel**  
Remediation Management Project Manager

**RECEIVED**

8:39 am, Nov 02, 2010

Alameda County  
Environmental Health

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E-Mail: charles.carmel@bp.com

1 November 2010

Re: Revised Vapor Intrusion Assessment Sampling Work Plan  
Atlantic Richfield Company Station #2035  
1001 San Pablo Avenue, Albany, California  
ACEH Case #RO0000100

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

Submitted by,



Chuck Carmel  
Remediation Management Project Manager

Attachment:

1 November 2010

Project #06-88-610

Atlantic Richfield Company  
PO Box 1257  
San Ramon, CA 94583  
Submitted via ENFOS

Attn: Mr. Chuck Carmel

RE: Revised Vapor Intrusion Assessment Sampling Work Plan, Atlantic Richfield Company  
Station #2035, 1001 San Pablo Avenue, Albany, California; ACEH Case #RO0000100

Dear Mr. Carmel:

Broadbent & Associates, Inc. (BAI) is pleased to present this *Revised Vapor Intrusion Sampling Work Plan* for the Atlantic Richfield Company (a BP affiliated company) Station #2035, located at 1001 San Pablo Avenue, Albany, California (Site). BAI prepared this work plan in response to the 2 September 2010 letter from Mr. Paresh Khatri of Alameda County Environmental Health Services (ACEH). This brief work plan proposes a revised procedure for sampling soil gas from the five existing vapor intrusion assessment monitoring implants at the Site. A Site Location Map and Site Layout Plan with Soil Vapor Monitoring Points are provided as Drawing 1 and Drawing 2, respectively.

As BAI reported in the *Vapor Intrusion Assessment Report* (BAI, 7/30/2010), during two independent soil vapor sampling events, significant concentrations of leak check tracer compounds were detected. Laboratory analysis of soil vapor samples collected on 16 April 2010 detected elevated concentrations of 1,1-Difluoroethane (1,1-DFA), the leak check tracer compound administered via spray can around the well and on the sampling train fittings during sample collection. Due to the elevated concentrations of the 1,1-DFA leak check tracer compound, soil vapor sampling was attempted again on 14 May 2010 using a different leak check compound, Isopropyl Alcohol (IPA). In this instance, paper towels saturated with liquid IPA were placed around the well and on the sampling train fittings during collection of samples. Elevated concentrations of the IPA leak check tracer compound were again detected in the samples. This was troubling in that no loss of vacuum was observed during the negative pressure leak checks which preceded each sampling. In the 30 July 2010 report, BAI stated that its sampling protocols were going to be re-evaluated and recommended collecting soil vapor samples using a different approach since it was problematic to validate the previously collected analytical data.

Upon consultation with experts in the field of vapor intrusion assessment, BAI recommends the following procedure for sampling soil gas from the five existing vapor intrusion assessment monitoring implants at the Site. One-liter Summa<sup>®</sup> canisters will be used to collect samples for analysis by an offsite laboratory. The Summa<sup>®</sup> canisters will be shipped by the laboratory under high vacuum, leak checked, and batch certified to be free of contaminants. The initial canister vacuum will be measured before use and should be approximately 28-30 inches of Mercury (in.Hg). If the initial vacuum is less than 26 in.Hg, the affected canister(s) will not be used.

A calibrated syringe will be used to purge the assembled sampling train (the sampling implant shaft, aboveground tubing, Swagelok fittings and valves) a minimum of three volumes prior to sample



collection. Following the purge, the sampling train will be checked for leaks during a shut-in leak test by applying for 10 minutes a vacuum of 15 in.Hg (fifty percent above the standard threshold of 10 in.Hg considered representative of "No Flow" conditions). If the vacuum does not drop, this will indicate the sample train is not leaking. Once this shut-in leak test is complete, the in-line valve to the Summa© canister will be opened and the sample collected. The sampling flow rate should not exceed 200 milliliters per minute (mL/min) as set by a laboratory-supplied flow regulator. Samples will be collected until the vacuum in the canister(s) reaches approximately 5 in.Hg or 30 minutes have elapsed, whichever is reached first.

A chemical leak check will be performed to identify whether ambient air is leaking into the sample train. During sample collection, a clear plastic shroud with pliable weather-stripping along its base will be placed over the well head, the sample tubing, fittings, and the Summa© canisters. A gaseous tracer/leak test compound, Helium in this case, will be released within the shroud to create a slight positive-pressure atmosphere. Helium concentrations will be monitored during sample collection through ports in the shroud with a direct-reading field instrument (e.g., Radiodetection Model MGD-2002 Handheld Helium Detector, or equivalent) to record that a tracer gas atmosphere is being maintained during sample collection. Helium concentrations within the shroud will be recorded in the field notes at a minimum of five minute intervals. A schematic of the soil gas implant sampling train layout is provided as Drawing 3. Standard details of the soil vapor monitoring wells are provided in Drawing 4.


Collected samples will be submitted promptly under chain-of-custody protocol to Calscience Environmental Laboratories, Inc. in Garden Grove, California (CA-ELAP #1230, NELAP #03220CA). Soil gas samples will be analyzed for Gasoline Range Organics (GRO, hydrocarbon chain lengths C6-C12), Benzene, Toluene, Ethylbenzene, Total Xylenes (BTEX), Methyl Tertiary Butyl Ether (MTBE), Ethyl Tertiary Butyl Ether (ETBE), Di-Isopropyl Ether (DIPE), Tertiary Amyl Methyl Ether (TAME), Tertiary Butyl Alcohol (TBA), and Ethanol by EPA Method TO-15. Laboratory analytical results will be reported in milligrams per cubic meter (mg/M<sup>3</sup>). The soil gas samples will also be analyzed for the leak check tracer gas Helium (He), along with Oxygen (O<sub>2</sub>), Carbon Dioxide (CO<sub>2</sub>), and Methane (CH<sub>4</sub>) following the ASTM D-1946 methodology. Laboratory analyses of the soil gas samples will be performed in accordance with the EPA standard holding times for Summa© canisters.

Upon completion of the work activities described above and after receipt of the laboratory analytical data, BAI will prepare a revised Vapor Intrusion Assessment Report. The revised Vapor Intrusion Assessment Report will contain: a brief description of the sampling procedures performed, copies of the field notes, tabulated measurements, the laboratory analytical report with chain-of-custody documentation, discussion of results, conclusions, and recommendations, as appropriate. BAI anticipates that a revised Vapor Intrusion Assessment Report can be submitted to BP and the ACEH within 60 days of approval of this work plan by the ACEH.

Broadbent & Associates, Inc. trusts that the revised sampling procedure provided in this work plan will be acceptable to BP and the ACEH. Should you have any questions or require additional information, please do not hesitate to contact me at (530) 566-1400.

Sincerely,

BROADBENT & ASSOCIATES, INC.

  
Thomas A. Venus, PE  
Senior Engineer



Attachments

- Drawing 1. Site Location Map
- Drawing 2. Site Layout Plan with Soil Vapor Monitoring Points
- Drawing 3. Soil Gas Implant Sampling Schematic
- Drawing 4. Soil Vapor Monitoring Well Details

cc: Mr. Paresh Khatri, Alameda County Environmental Health (Submitted via ACEH ftp site)  
Electronic copy uploaded to GeoTracker



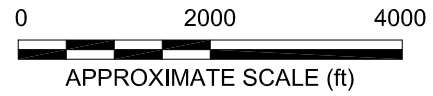
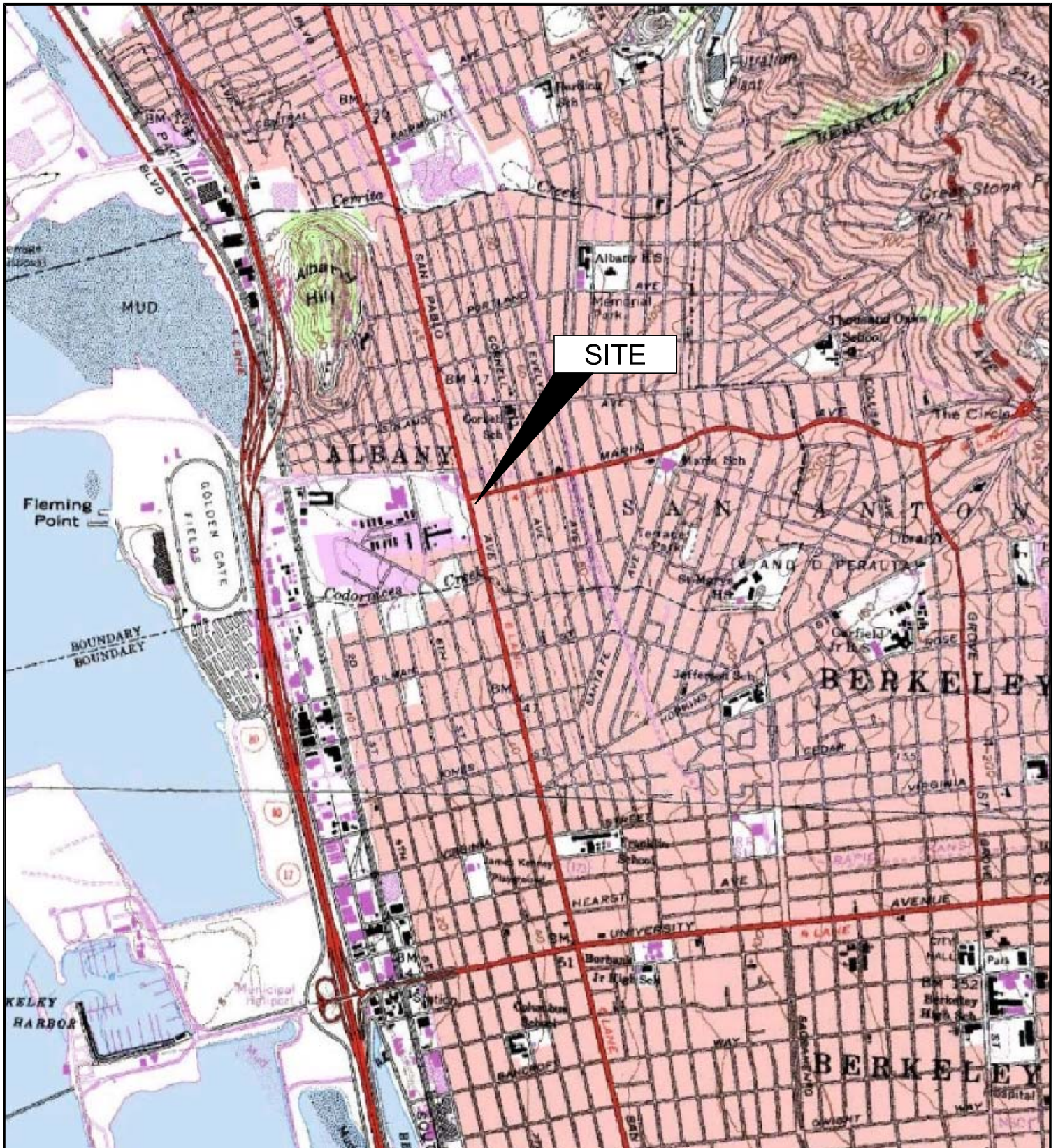
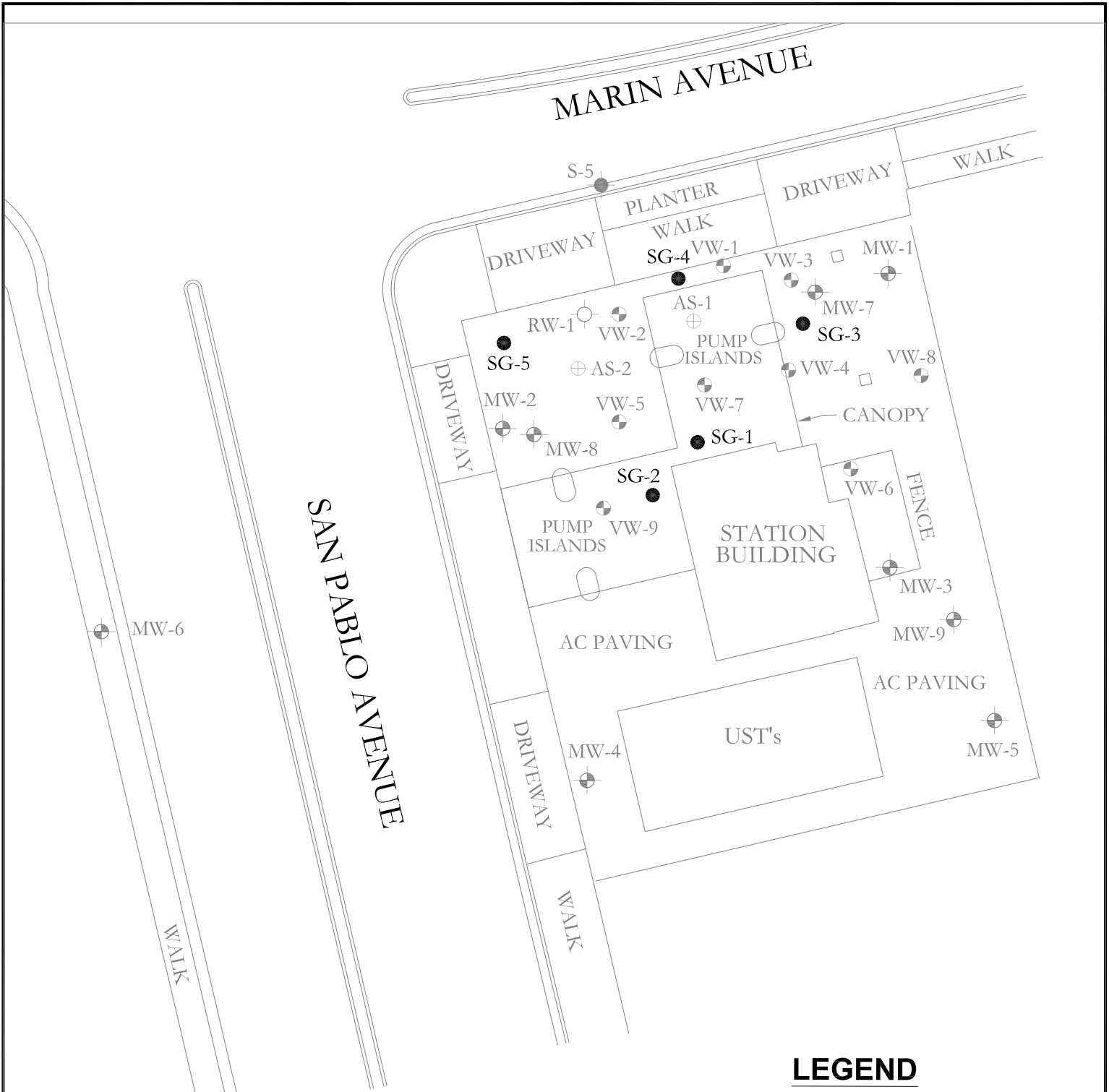


IMAGE SOURCE: USGS

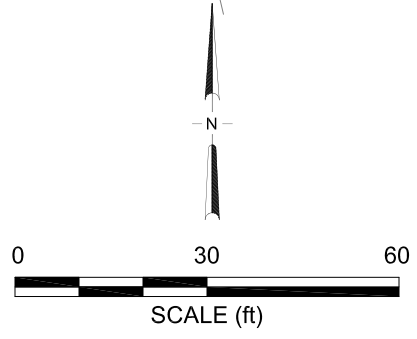


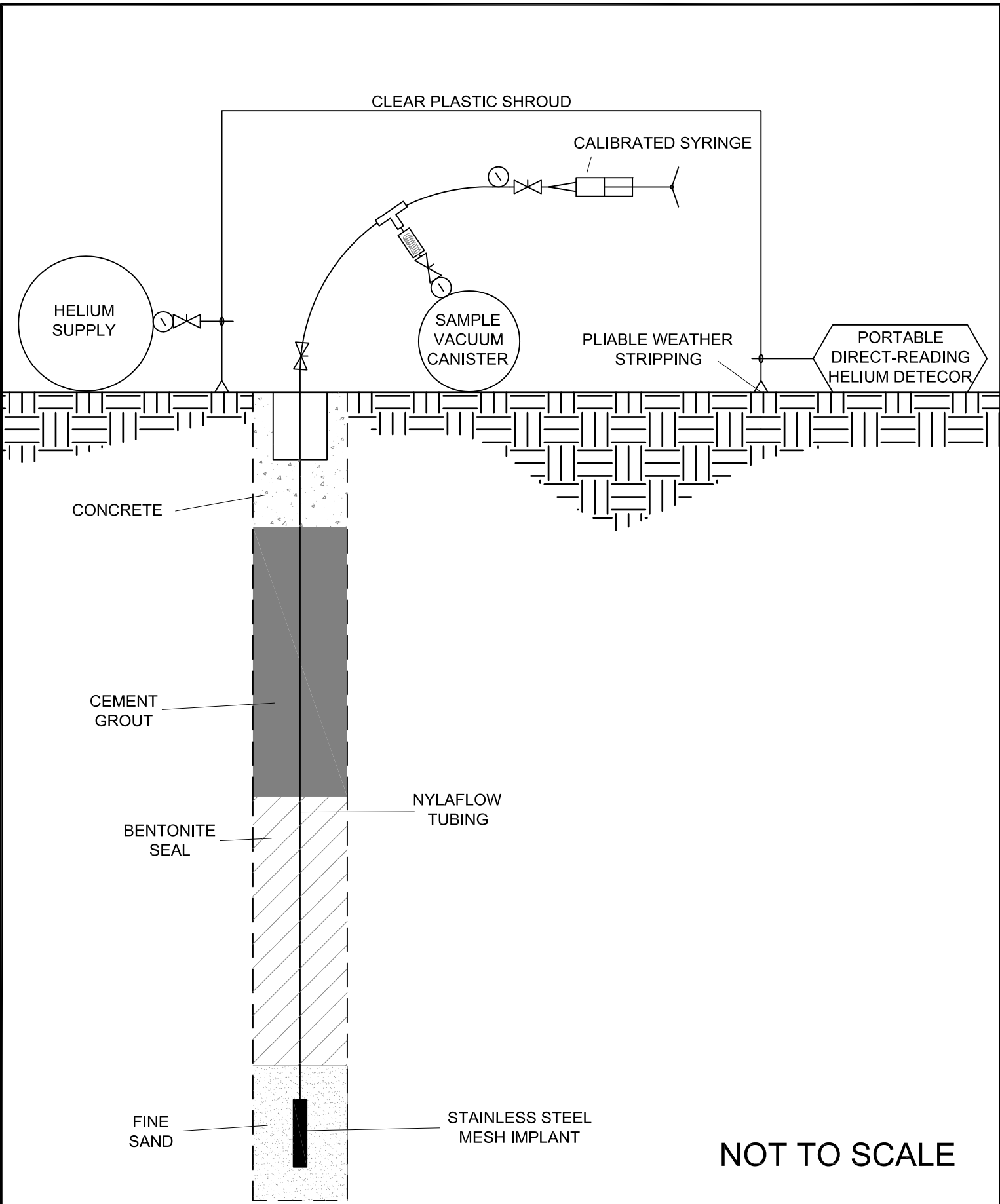


**LEGEND**

- Soil Gas Boring/ Temporary Vapor well
- ⊕ (ARCO) Monitoring well
- ⊕ (ARCO) Vapor extraction well
- ⊕ (ARCO) Air sparge well
- S-5 ● (Shell) Monitoring well

NOTES: SITE MAP ADAPTED FROM WOOD RODGERS FIGURE. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.





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# SOIL VAPOR MONITORING WELL DETAILS



Project Number: 06-88-610

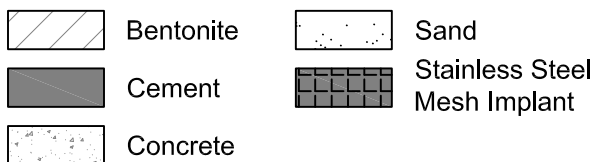
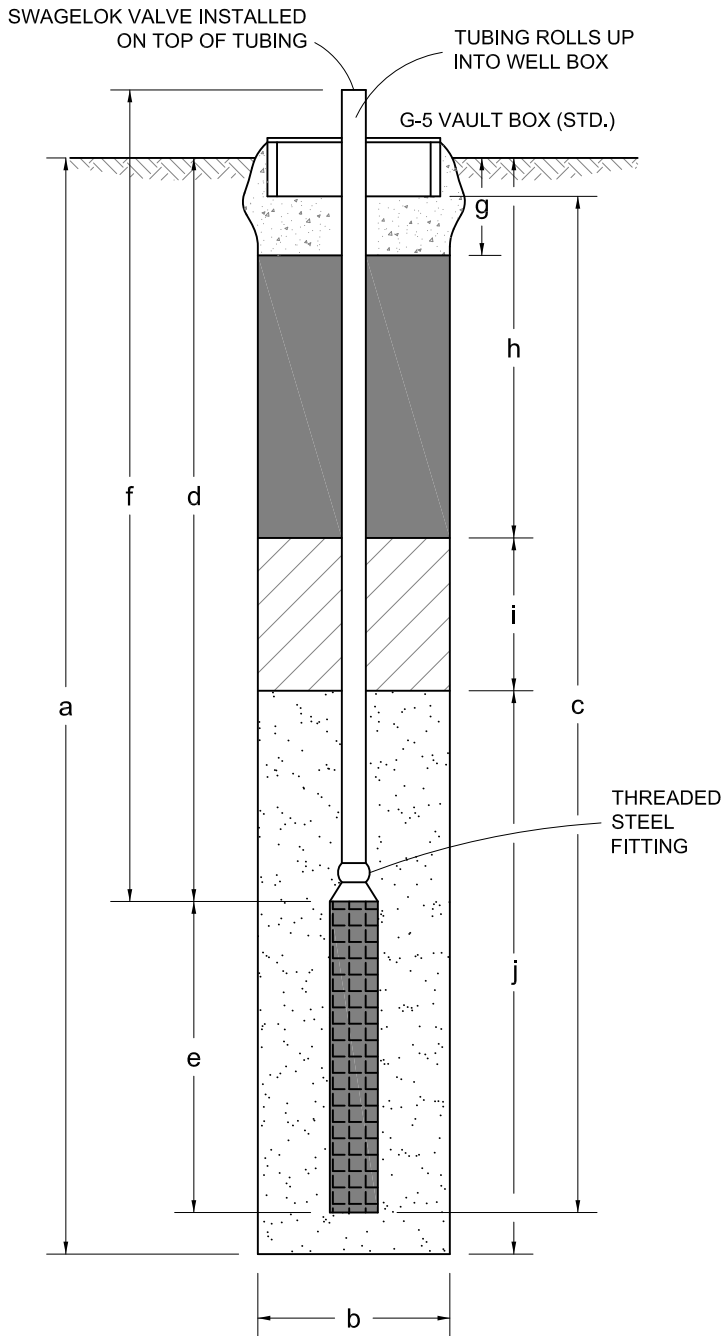
Project Name: ARCO Service Station #2035

Boring / Well No.: SG-1 Thru SG-5

Location: 1001 San Pablo Ave., Albany, CA

Installation Date: 9-10 March 2010

Well Permit No.: W2009-1115



## EXPLORATORY BORING

a. Total Depth: 3.5 ft.

b. Diameter: 6 in.

Drilling Method: Air Knife / Vacuum Extraction

## WELL CONSTRUCTION

c. Total Well Depth: 3.5 ft.

Well Screen Material: 3/8" dia. Stainless Steel Mesh Implant

d. Depth to Top Perforations: 3.0 ft.

e. Perforated Interval From: 3.0 to 3.5 ft.

f. Length of Tubing: 7 ft.

Tubing Connected to Well Screen at: 3.0 ft.

Tubing Diameter: 3/8 in.

Tubing Material: Nylaflo

g. Surface Seal: 0 to 0.5 ft.

Seal Material: Concrete

h. Backfill: 0.5 to 1.0 ft.

Backfill Material: Neat Cement

i. Seal: 1.0 to 2.5 ft.

Seal Material: Bentonite

j. Filter Pack: 2.5 to 3.5 ft.

Filter Pack Material: #2/12 Sand

## NOTES

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