ARC™
Document Solutions

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

Re: ARC Document Solutions (Formerly City Blue Print)
RWQCB Case#01-0210
1700 Jefferson St
Oakland CA, 94612

ARC has directed Applied Water Resources Corporation (AWR) to provide, on our behalf, professional environmental consulting services to the best of their ability. To the best of my knowledge, the information in this report is accurate and all local Agency and/or Regional Water Quality Control Board regulations and guidelines have been followed.

This report was prepared by AWR and ARC has relied on their advice and assistance. I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Sincerely,

Matt Westbrock - Asst. Corp. Controller
Authorized Representative

Attachment: Report

APPLIED WATER RESOURCES
CORPORATION

2363 Mariner Square Drive, Suite 245, Alameda, California 94501
510 671 2090

March 10, 2015

Mr. Mark Detterman
Alameda County Department of Environmental Health-LOP
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

RE: Foundation Depth Survey Report
1700 Jefferson Street, Oakland, California

Dear Mr. Detterman:

On behalf of ARC Document Solutions and pursuant to a letter issued by Alameda County Department of Environmental Health (ACEH) on June 19, 2014, Applied Water Resources (AWR) has prepared this *Foundation Depth Survey Report* for 1700 Jefferson Street, Oakland, California (Site).

ACEH requested a survey to determine if basements, elevators, or other subsurface constructions are present in buildings near the site that reduce the separation distance between the indoor air and the subsurface environment. Based on the known distribution of petroleum in the subsurface, AWR surveyed the building near MW-5, the adjacent apartment building to the north of the site, and the building located at the Site.

The following three steps were implemented at each property as part of this investigation:

1. Request a review of all records on file at the City of Oakland.

2. Request a discussion with the property owner.

3. Request opportunity to inspect interior of building.

1825 San Pablo Ave – Building near MW-5

A request to review building plans as well as a history of all permits issued was submitted to the City of Oakland for the building located near MW-5. The City of Oakland stated that they did not have plans for this building in their records. The permit history did not offer any additional information regarding the foundation. No permits were available to review on microfiche.

Several attempts were made to reach the property owner to acquire building plans but a response was not received. During the ground water monitoring event in the 3rd quarter, AWR personnel talked with contractors renovating the interior of the property. The contractors stated that it appears that the building is slab on-grade.

581 18th Street – Adjacent Apartment Building

A request to review building plans as well as a history of all permits issued was submitted to the City of Oakland for the adjacent apartment building to the north of the Site. The City of Oakland stated that they did not have plans for this building in their records. Historical permits were reviewed by microfiche, however the permits did not offer any additional information regarding the foundation.

AWR met with the property owner of the apartment building to discuss the project and to gather any information regarding the building. The property owner stated that he did not have any building plans and the City of Oakland could not provide him with any. He did not know the depth of the foundation of his building nor the courtyard next to the building. The property owner stated that there is not an elevator in his building.

1700 Jefferson –Building Located on-Site

A request to review building plans as well as a history of all permits issued was submitted to the City of Oakland for building located on the Site. A permit was issued for the building in 1987, however the City of Oakland stated that they did not have plans for this building in their records. The City did have plans from 1939 for the layout of the former service station. This plan was presented in the Work Plan Addendum from March 2014. Historical permits were reviewed, however the permits did not offer any additional information regarding the foundation. ARC could not locate building plans in its records. A visual inspection of the building indicates that the building is likely slab on-grade.

Proposed Site Investigation

Based on the findings, it is recommended that the soil vapor sampling depths proposed in the March 27, 2014 Work Plan Addendum remain at 6 feet below grade.

Five temporary soil vapor points will be installed to a depth of 6 feet below finish at the locations shown in Figures 1 and 1a to assess potential vapor intrusion risk. An access agreement with the property over at 581 18th street is currently pending, however in the event that we are unable to access the courtyard location, an additional temporary soil gas well will be installed at the southern location on 18th St to 17 feet bgs because the courtyard has been measured to be approximately 11 feet bgs.

AWR's Standard Operating Procedures (SOPs) for soil vapor sampling is provided in Appendix A.

The proposed work is a guide to investigation and is subject to change depending on actual field conditions and investigation findings. All fieldwork will be performed under the supervision of a California Professional Geologist.

We hope this Report meets your needs. Please call me at 510-671-2085 with your comments.

Regards,

Applied Water Resources

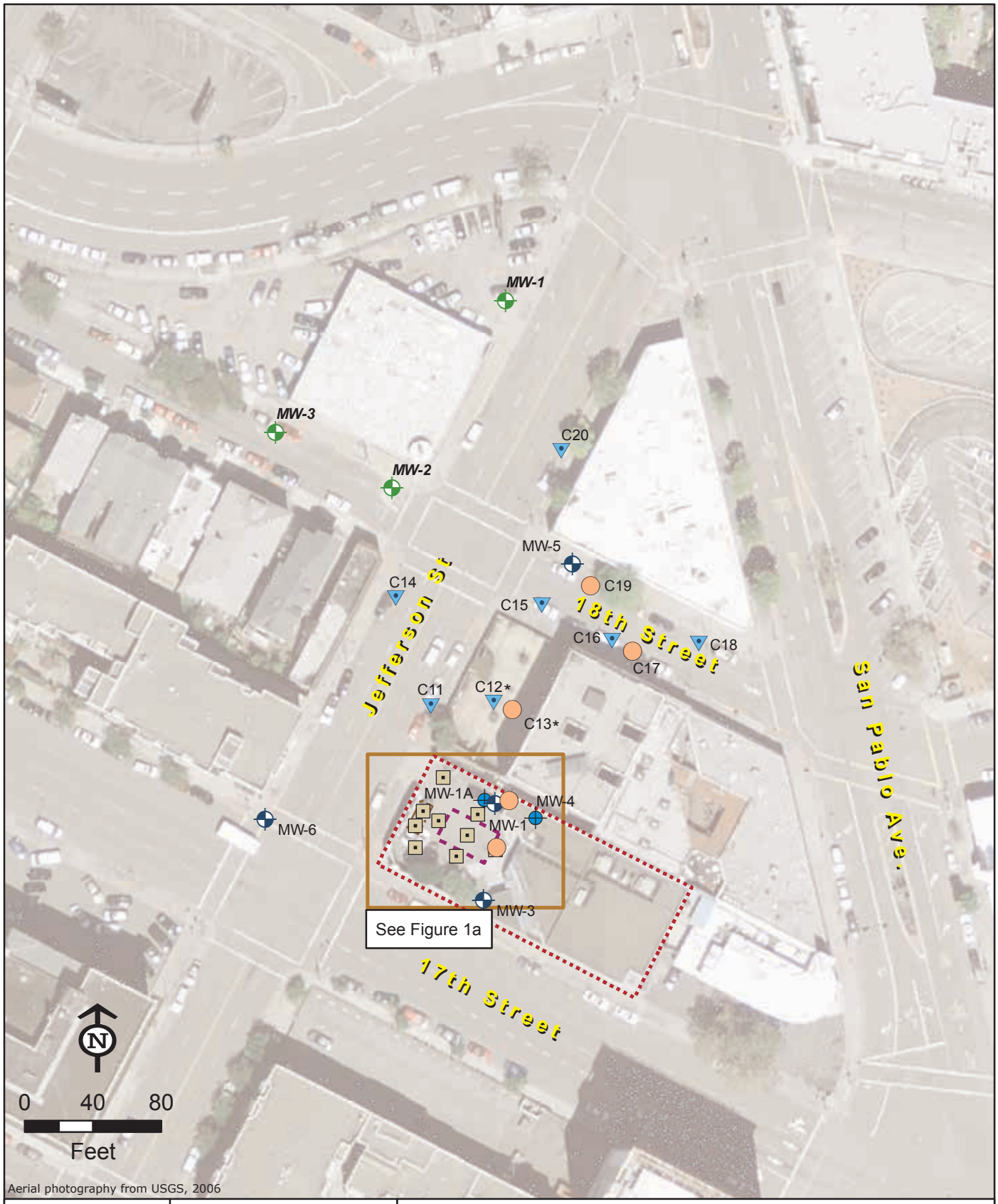
Steven Michelson
Principal Geologist

Distribution List

Matthew Westbrook
ARC Document Solutions
1981 N. Broadway, Suite 385
Walnut Creek CA 94596

Attachments:
Figures
Appendix A

FIGURES



APPLIED WATER RESOURCES

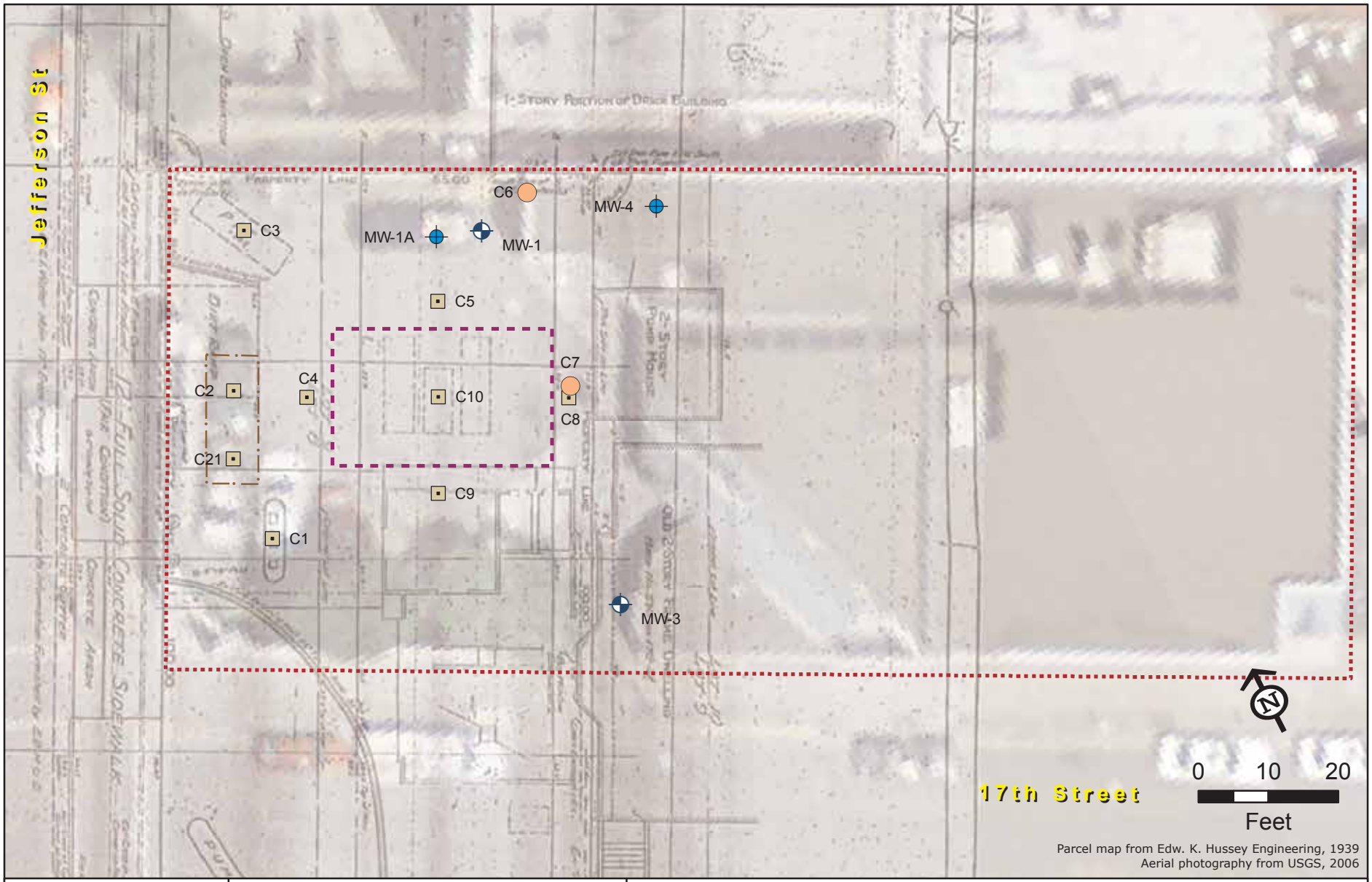
Figure - 1

Proposed Sampling Locations

1700 Jefferson Street, Oakland, CA

- Proposed Soil Gas Well
- Proposed Soil Sample
- Proposed Ground Water Sample
- Monitor Well
- Extraction Well
- 612 18th Street Monitor Well (Destroyed)
- Former Dispenser Island (approx)
- Tank Removal Excavation Area (approx.)
- Property Boundary

* = If Access Allowed



APPLIED WATER RESOURCES

Figure - 1a

Proposed Sampling Locations Detail Map

1700 Jefferson Street, Oakland, CA

- Proposed Soil Gas Point
- Proposed Soil Sample
- Monitor Well
- Extraction Well
- Tank Removal Excavation Area (approx.)
- Property Boundary
- Former Dispenser Island (approx.)

APPENDIX A

INSTALLATION of TEMPORARY SOIL GAS WELL and COLLECTION of SCREENING LEVEL SOIL GAS SAMPLE

This document describes Applied Water Resources' standard operating procedures (SOPs) to install a temporary soil gas well and collect a screening level sample of soil gas. Screening level samples of soil gas could be used as part of a site investigation, such as to delineate a source area, assess shallow preferential pathways, evaluate potential migration within underground utility corridors, map a shallow plume of volatile compounds in ground water, etc.

This SOP is not appropriate for the collection of soil gas samples for purpose of assessing risk to indoor air quality.

This SOP is based on guidance from the soil gas investigations advisory (DTSC, 2012). Specific field procedures are summarized below.

Construction of a Temporary Soil Gas Well

Temporary soil gas wells are typically used for one or two sampling events and then decommissioned in accordance with the local regulating agency requirements and the methods described in the Well Abandonment Section.

The Work Plan and the objectives of the investigation should specify the depth at which the soil gas sample should be collected. The boring within which the soil gas well is constructed is typically created by using direct push drilling equipment, but can be advanced using hollow, solid stem, or hand auger. The borehole diameter will be a minimum of 2 inches. If soil conditions are stable, then the soil gas well can be constructed in an open, uncased, borehole. If soil conditions are unstable, then the borehole will be cased prior to well construction.

All equipment, tools, and materials used to construct the borehole and well must be clean, dry, and free of chemicals, including cleaning chemicals. Implement the following steps once the desired depth of the borehole and soil gas sampling depth has been determined:

1. Drill the borehole to the desired sampling depth.
2. Place a minimum 2-inch thick bed of sand in the bottom of the boring to ensure that the tubing is not in direct contact with the bottom. Sand will be RMC Lonestar 2/12 mix, or similar.
3. Place a clean 3/4-inch diameter PVC pipe into the borehole that extends from the top of the sand at the bottom of the borehole to 1 to 3 feet above ground surface.
4. Measure and cut a length of the sample tubing that is equal to the desired sampling depth plus 1 to 5 feet. The additional length of tubing will remain above ground surface to enable collection of the soil gas sample.

5. The sample tubing will be made of material that will not react with site contaminants (i.e. Teflon, stainless steel) and with an inside diameter of 1/8 to 1/4 inches that is appropriate for the equipment to be used to collect the soil gas sample. Attach a filter at the bottom of the tubing to prevent sand from entering the tubing.

6. Install the tubing into the borehole by threading the tubing through the PVC pipe to the top of the sand. Placement of the tubing within the PVC will keep the tubing centered within the borehole, keep the filter completely within the sand pack materials, and maintain integrity of the well seal by eliminating contact of the tubing with the native geologic materials.

7. Place a minimum of 6 inches and maximum of 10 inches of sand pack above the filter. Use a separate small diameter PVC pipe to tremie sand into borings deeper than 15 feet to avoid bridging. Do not place sand directly into the PVC pipe containing the tubing because the sand will likely bridge and lock the tubing within the PVC pipe, preventing proper completion of the well.

8. Lift PVC pipe containing the tubing to the top of the sand pack while keeping the tube bottom with filter at the desired depth. If present, also raise the borehole casing and tremie pipe to the top of the sand pack. Measure the depth to the top of the sand pack and add additional sand as necessary. Record all the final depth to the top of sand pack.

9. Place a minimum 6 inches and maximum of 12 inches of dry granular bentonite above the sand pack.

10. Prepare a thick bentonite grout mixture by hydrating bentonite within a container at ground surface. The mixture should approximate the consistency of applesauce.

11. Remove the PVC pipe containing the tubing. Remove the tremie pipe. While holding the sample tubing so that it is centered within the borehole, fill the borehole to the surface with hydrated bentonite grout mixture.

12. If present, remove the borehole casing and add more bentonite grout to top off the boring to ground surface.

13. Install a gas-tight valve or fitting at the end of the tubing and protect the temporary well and tubing with a barricade, flagging, or similar.

14. If the well is permanent, complete the installation with a traffic rated well box.

Collecting a Screening Level Sample of Soil Gas

Following completion of the soil gas well, allow the subsurface to equilibrate back to representative conditions for at least one hour prior to collecting a soil gas sample. Do not collect soil gas screening samples during or within two days of a rainfall event.

1. Assess the sample tubing and confirm that the well is intact and its integrity has not been compromised.

2. Calculate the volume of air within the soil gas well that will be purged prior to collecting a soil gas sample. One purge volume is the sum of the following volumes:

    - The internal volume of tubing,
    - The void space of the sand pack around the bottom of the tubing and filter (assume 30% porosity), and
    - The void space of the dry bentonite in the annular space, (assume 30% porosity). Assume this bentonite has not been hydrated.

3. Attach a centrifugal or vacuum pump to the ground surface end of the tubing and a Tedlar bag (or similar) to collect the screening level sample of soil gas. Following the removal of each purge volume, collect a soil gas sample within the Tedlar bag.

4. Using a meter designed to measure the target analytes (i.e. photoionization detector, 4-Gas meter, or Flame Ionization Detector), measure the concentration of volatile chemicals within the Tedlar bag. Monitor the meter continuously for at least 30 seconds and record the maximum concentration measured.

5. Continue purging and measuring concentrations until concentrations appear to stabilize within approximately 10% for three consecutive measurements. If concentrations do not stabilize after 10 purge volumes, then sampling may cease.

Well Abandonment

After sample collection ceases at a soil gas well, the well will be abandoned with concurrence from the local regulating agency. Unless otherwise directed by the regulatory agency, the following steps should be followed when decommissioning a soil gas well:

1. Either remove the tubing by pulling out of the borehole, or cut the well tubing as far below ground surface as possible;

2. Remove the hydrated bentonite grout to within approximately 1 foot of finished grade. If the borehole was advanced through hard surface materials (e.g. asphalt, concrete), fill the borehole

with suitable materials to finished grade. If the borehole was advanced through soil, fill the last foot of the borehole hole with compacted native material.

3. If the borehole and soil gas well penetrates a confining clay unit, then overdrilling the borehole to remove all sand materials followed by tremie grouting is recommended to prevent potential contaminant migration across distinct lithologic zones. The driller will utilize methods that assure the overdrilling does not drift off the borehole and soil gas well. All overdrilled holes will be grouted in accordance with local regulatory specifications.

4. In all cases, restore pavement and vegetation to approximate original conditions, or as requested by the land owner.

References

DTSC, California EPA, and RWQCB San Francisco and Los Angeles; *Advisory, Active Soil Gas Investigations*, April 2012.

This document describes Applied Water Resources' standard operating procedures (SOPs) to install a temporary soil gas well and collect a sample of soil gas. This SOP is based on guidance from the soil gas investigations advisory (DTSC, 2012). Specific field procedures are summarized below.

Construction of a Temporary Soil Gas Well

Temporary soil gas wells are typically used for one or two sampling events and then decommissioned in accordance with the local regulating agency requirements and the methods described in the Well Abandonment Section.

The Work Plan and the objectives of the investigation should specify the depth at which the soil gas sample should be collected. The boring within which the soil gas well is constructed is typically created by using direct push drilling equipment, but can be advanced using hollow, solid stem, or hand auger. The borehole diameter will be a minimum of 2 inches. If soil conditions are stable, then the soil gas well can be constructed in an open, uncased, borehole. If soil conditions are unstable, then the borehole will be cased prior to well construction.

All equipment, tools, and materials used to construct the borehole and well must be clean, dry, and free of chemicals, including cleaning chemicals. Implement the following steps once the desired depth of the borehole and soil gas sampling depth has been determined:

1. Drill the borehole to the desired sampling depth.
2. Place a minimum 2-inch thick bed of sand in the bottom of the boring to ensure that the tubing is not in direct contact with the bottom. Sand will be RMC Lonestar 2/12 mix, or similar.
3. Place a clean 3/4-inch diameter PVC pipe into the borehole that extends from the top of the sand at the bottom of the borehole to 1 to 3 feet above ground surface.
4. Measure and cut a length of the sample tubing that is equal to the desired sampling depth plus 1 to 5 feet. The additional length of tubing will remain above ground surface to enable collection of the soil gas sample.
5. The sample tubing will be made of material that will not react with site contaminants (i.e. Teflon, stainless steel) and with an inside diameter of 1/8 to 1/4 inches that is appropriate for the equipment to be used to collect the soil gas sample. Attach a filter at the bottom of the tubing to prevent sand from entering the tubing.
6. Install the tubing into the borehole by threading the tubing through the PVC pipe to the top of the sand. Placement of the tubing within the PVC will keep the tubing centered within the borehole, keep the filter completely within the sand pack materials, and maintain integrity of the well seal by eliminating contact of the tubing with the native geologic materials.

7. Place a minimum of 6 inches and maximum of 10 inches of sand pack above the filter. Use a separate small diameter PVC pipe to tremie sand into borings deeper than 15 feet to avoid bridging. Do not place sand directly into the PVC pipe containing the tubing because the sand will likely bridge and lock the tubing within the PVC pipe, preventing proper completion of the well.

8. Lift PVC pipe containing the tubing to the top of the sand pack while keeping the tube bottom with filter at the desired depth. If present, also raise the borehole casing and tremie pipe to the top of the sand pack. Measure the depth to the top of the sand pack and add additional sand as necessary. Record all the final depth to the top of sand pack.

9. Place a minimum 6 inches and maximum of 12 inches of dry granular bentonite above the sand pack.

10. Prepare a thick bentonite grout mixture by hydrating bentonite within a container at ground surface. The mixture should approximate the consistency of applesauce.

11. Remove the PVC pipe containing the tubing. Remove the tremie pipe. While holding the sample tubing so that it is centered within the borehole, fill the borehole to the surface with hydrated bentonite grout mixture.

12. If present, remove the borehole casing and add more bentonite grout to top off the boring to ground surface.

13. Install a gas-tight valve or fitting at the end of the tubing and protect the temporary well and tubing with a barricade, flagging, or similar.

14. If the well is permanent, complete the installation with a traffic rated well box.

Preparation for Purging and Collecting a Soil Gas Sample

Subsurface conditions are disturbed during drilling and probe placement. To allow for the subsurface to equilibrate back to representative conditions, the purge volume test, leak test and sampling of soil gas will not be conducted for at least two hours following soil gas well installation. For soil gas wells installed with hollow stem or hand auger drilling methods, do not conduct the purge volume test, leak test and soil gas sampling for at least 48 hours after soil gas well installation. Do not collect soil gas screening samples during or within two days of a rainfall event (greater than ½ inches of rain over 24 hours). Soil gas samples will be free of water, and no sample will be collected if water is observed during purging. Purge volume tests, leak tests and soil gas sampling methods are based on the soil gas investigations advisory (DTSC, 2012).

Purge Volume Test

The purpose of purging is to ensure that stagnant air is removed from the well and sampling system and that samples are representative of subsurface conditions. The purge volume test is used to determine the appropriate amount of air to remove prior to sampling. A purge volume test will be conducted on permanent soil gas wells that will be used for routine monitoring. If there are multiple wells at a site, the purge volume test will be conducted at the location with the highest estimated concentrations of the target compound. For temporary soil gas wells, no purge volume test is required and a default of three purge volumes will be used.

The purge volume test is conducted by collecting and analyzing a sample for target compounds after removing one, three and ten purge volumes. The purge volume test samples should be analyzed with the same analytical method as the constituents of concern and bioattenuation indicators as applicable.

One purge volume is the sum of the following volumes:

- The internal volume of tubing,
- The void space of the sand pack around the bottom of the tubing and filter (assume 30% porosity), and
- The void space of the dry bentonite in the annular space, (assume 30% porosity). Assume this bentonite has not been hydrated.

Sample Vacuum Shut in Test

In order to note possible leaks in the sample canister, a shut-in test is conducted. A dedicated pressure gauge is used to record pressure in each sample canister for a minimum of five minutes prior to sampling. If a significant change in pressure is observed, a different sample canister will be used for sample collection.

Recording, Labeling, Storage, Handling, and Transport

All samples should be labeled with a unique sample identification, the location of the sample, date and time of collection. Purge and sample volume, flow rates, helium concentrations, vacuum check and shut in test data are recorded in the field form for soil gas sampling (Appendix B). Samples are stored away from direct sunlight in coolers or boxes and transported under standard chain of custody procedures to a NELAP certified analytical laboratory.

Unshrouded Soil Gas Sampling with Leak Check Compound

A leak test is used to evaluate whether ambient air is introduced into the soil gas sample during the collection process. A leak test will be conducted at every soil gas well each time a soil gas sample is collected to evaluate the integrity of the sample. Introducing ambient air may result in an underestimation of actual site contaminant concentrations or may introduce external contaminants into samples from ambient air. The leak check compound should be selected based on the target analytical compounds for the site. The compound should not interfere with the target analytes. Verify with the proposed analytical laboratory the appropriateness of a leak check compound prior to sampling and request that the compound is reported in addition to the target analytes.

1. Prior to removing any hardware, record the pressure on the gauge located on the sample train in order to note possible leaks. If the gauge reads 0, use a new sample train.
2. Connect the sample train to the downhole tubing with a nut and ferrule fitting.
3. To purge, connect the sample train to a 6-liter summa canister. Volume of air will be calculated either based on the flow rate indicated on the summa can flow reducer or the change in pressure observed in the summa canister.
4. Once the appropriate volume has been purged, remove the sample train from the purge canister and connect to a 1.4 liter summa canister for sampling.
5. Once the sample canister is connected and air is flowing based on the train pressure readings, apply a clean paper towel soaked in the liquid leak check compound (i.e. acetone, isopropyl alcohol) to the fittings and the top of the well seal.
6. Once the sample train pressure gauge reads less than 4 inches of mercury, disconnect the sample canister from the train and store as described.

Soil Gas Sampling with Helium Shrouds

Soil gas sampling using helium shrouds helps indicate whether a leak is present in the train or the well seal prior to sample collection. If a leak is detected during the purging of the well, corrective measures are implemented such as hydrating or molding the bentonite seal, tightening the fittings, or repairing any holes in the tubing. Helium per ASTM method D1946 will be analyzed in all samples to determine the presence of leaks in the sample train or the well seal. Soil gas sampling using helium shrouds is conducted as described in the field manual provided by Curtis and Tompkins Laboratory (Appendix A).

Well Abandonment

After sample collection ceases at a soil gas well, the well will be abandoned with concurrence from the local regulating agency. Unless otherwise directed by the regulatory agency, the following steps should be followed when decommissioning a soil gas well:

1. Either remove the tubing by pulling out of the borehole, or cut the well tubing as far below ground surface as possible;

2. Remove the hydrated bentonite grout to within approximately 1 foot of finished grade. If the borehole was advanced through hard surface materials (e.g. asphalt, concrete), fill the borehole with suitable materials to finished grade. If the borehole was advanced through soil, fill the last foot of the borehole hole with compacted native material.

3. If the borehole and soil gas well penetrates a confining clay unit, then overdrilling the borehole to remove all sand materials followed by tremie grouting is recommended to prevent potential contaminant migration across distinct lithologic zones. The driller will utilize methods that assure the overdrilling does not drift off the borehole and soil gas well. All overdrilled holes will be grouted in accordance with local regulatory specifications.

4. In all cases, restore pavement and vegetation to approximate original conditions, or as requested by the land owner.

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DTSC, California EPA, and RWQCB San Francisco and Los Angeles; *Advisory, Active Soil Gas Investigations*, April 2012.