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April 30, 1991

Mr. Scott Seery
Alameda County
Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

Re: Chevron Service Station #9-6991
2920 Castro Valley Blvd.
Castro Valley, CA

Dear Mr. Seery:

Enclosed we are forwarding a Work Plan prepared by our consultant Groundwater Technology, Inc. dated April 26, 1991, which describes work steps we propose to take at the above referenced site. As per our previous discussions, we are proposing to test a new well design intended for shallow groundwater sites. The subject site is appropriate for testing this new design. The proposed monitor wells will be only 3/4-inch in diameter. The well installation process is simple and mirrors conventional well design. Instead of using augers to drill the borehole, this system would utilize the "Powercore" drilling technology. Once the borehole has reached the desired depth, it is completed as a 3/4-inch diameter monitor well using .020 machine-slotted PVC well screen and blank casing. The borehole is sealed to grade with neat cement and a locking, 8-inch diameter street box set above the well head. After completion, the well can be developed and sampled with a peristaltic pump and water level measurements taken with a small diameter slope indicator.

The proposed well design has several advantages over a conventional 2-inch well. Listed below are some of the advantages:

* Reduced cost for waste disposal generated from drill cuttings and development
* Quicker to install and less disruptive to service station operation
* Can be installed in places that are inaccessible to a drill rig
* Less purge water produced during sampling events

This well design would only be appropriate in relatively shallow groundwater situations. We anticipate a maximum effective depth for the wells of approximately 20-feet below grade. Lithology must be comprised of relatively competent soils. Gravel layers or sands may cause refusal of the coring system or collapsing before the well is completed.

The proposed well design offers significant benefits over conventional well design. We would appreciate your review and concurrence of this proposal. Chevron will proceed under self direction unless otherwise informed by your office.

If you have any questions or comments please do not hesitate to contact me at (415) 842-9581.

Very truly yours,
CHEVRON U.S.A. INC.

Nancy Vukelich
Environmental Engineer

Enclosure

cc: Mr. Lester Feldman, RWQCB-Bay Area
Mr. W.T. Scudder
File (9-6991W1 Listing)

WORK PLAN
PRELIMINARY SITE ASSESSMENT
CHEVRON SERVICE STATION NO. 9-6991
2920 CASTRO VALLEY BOULEVARD
CASTRO VALLEY, CALIFORNIA

APRIL 26, 1991

GROUNDWATER TECHNOLOGY, INC.
CONCORD, CALIFORNIA

GROUNDWATER TECHNOLOGY, INC.

4057 Port Chicago Highway, Concord, CA 94520 (415) 671-2387
FAX: (415) 685-9148

WORK PLAN

PRELIMINARY SITE ASSESSMENT

CHEVRON SERVICE STATION NO. 9-6991

2920 CASTRO VALLEY BOULEVARD

CASTRO VALLEY, CALIFORNIA

APRIL 26, 1991

Prepared for:

Ms. Nancy Vukelich
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Prepared by:

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Registered Geologist
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ALLEN B. STORM
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Exp. 6-92
STATE OF CALIFORNIA

R3322C.GLM

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PRELIMINARY SITE ASSESSMENT
CHEVRON SERVICE STATION NO. 9-6991
2920 CASTRO VALLEY BOULEVARD
CASTRO VALLEY, CALIFORNIA
APRIL 26, 1991

INTRODUCTION

Groundwater Technology, Inc. has been retained by Chevron U.S.A. Inc. to conduct a subsurface assessment at the Chevron Service Station No. 9-6991, located at 2920 Castro Valley Boulevard in Castro Valley, California (Figure 1, Site Location Map). The preliminary work will assess the possible lateral and vertical extent of adsorbed and dissolved hydrocarbons in the soil and groundwater beneath the site. This Work Plan contains the details of the proposed scope of work.

OBJECTIVE

The objective of the proposed work is to assess the possible presence of adsorbed- and dissolved-phase gasoline and waste-oil hydrocarbons in the soil and groundwater beneath this site. This will be accomplished by excavating three on-site soil corings and installing three groundwater monitoring wells in the completed soil borings.

SCOPE OF WORK

The following work-steps will be completed within this project:

- Secure the required permits from The Alameda County Flood Control and Water Conservation District, Zone 7.

- Excavate three, 2-inch-diameter soil corings on site and collect soil samples for laboratory analyses. Complete the corings as 3/4-inch-diameter groundwater-monitoring wells.

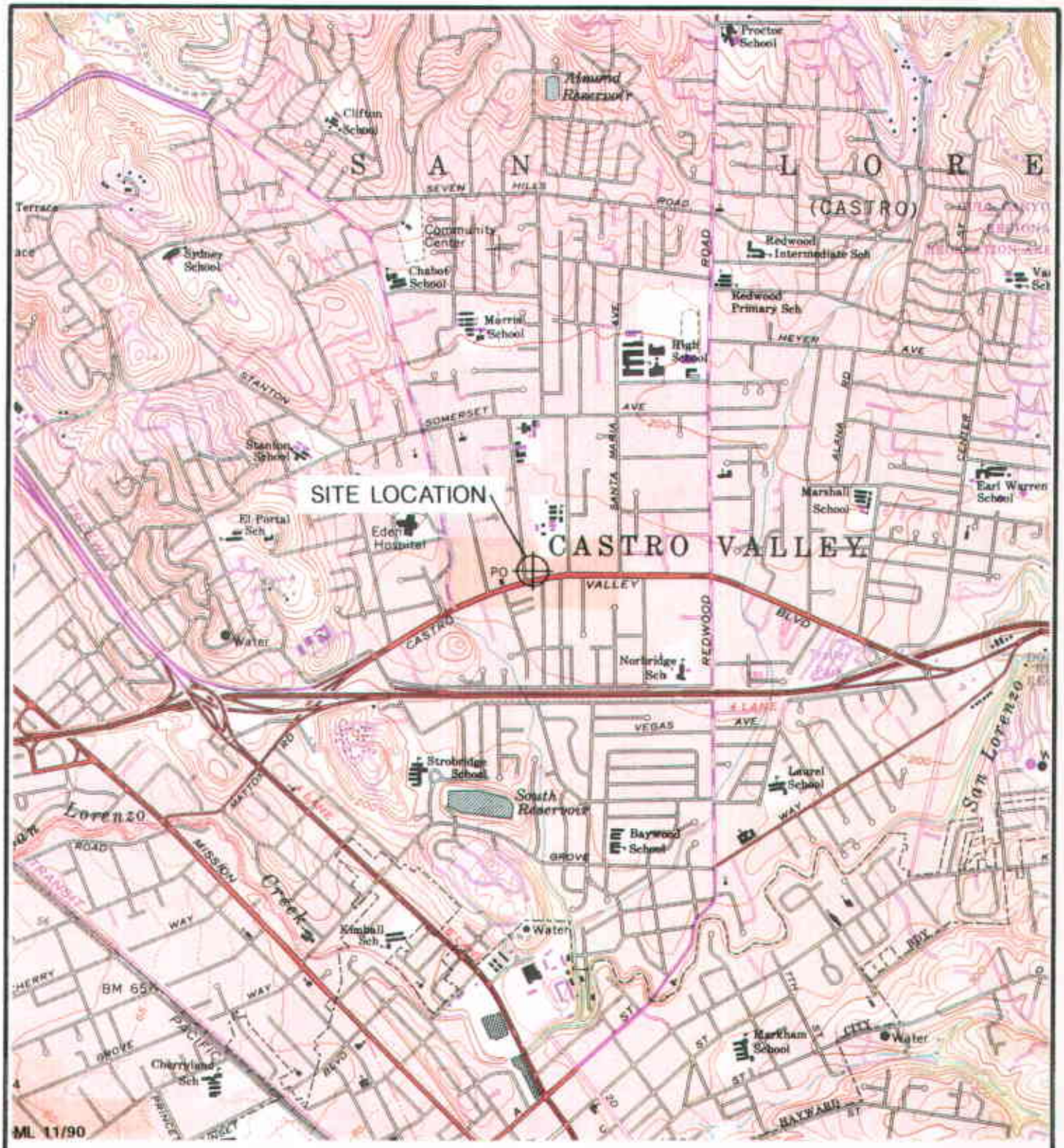


FIGURE 1
SITE LOCATION MAP

CHEVRON USA
CASTRO VALLEY, CALIFORNIA

- Survey the wellheads and collect groundwater elevation data for analyses to determine the groundwater flow gradient.

- Develop the wells and collect groundwater samples for laboratory analyses.

- Prepare a technical report presenting the results and findings of this assessment.

PERMITTING

Groundwater Technology will obtain soil boring and monitoring-well installation permits from the Alameda County Flood Control and Water Conservation District. The proposed well locations will be marked with white paint and, as required by state law, Underground Service Alert will be contacted prior to the commencement of field operations.

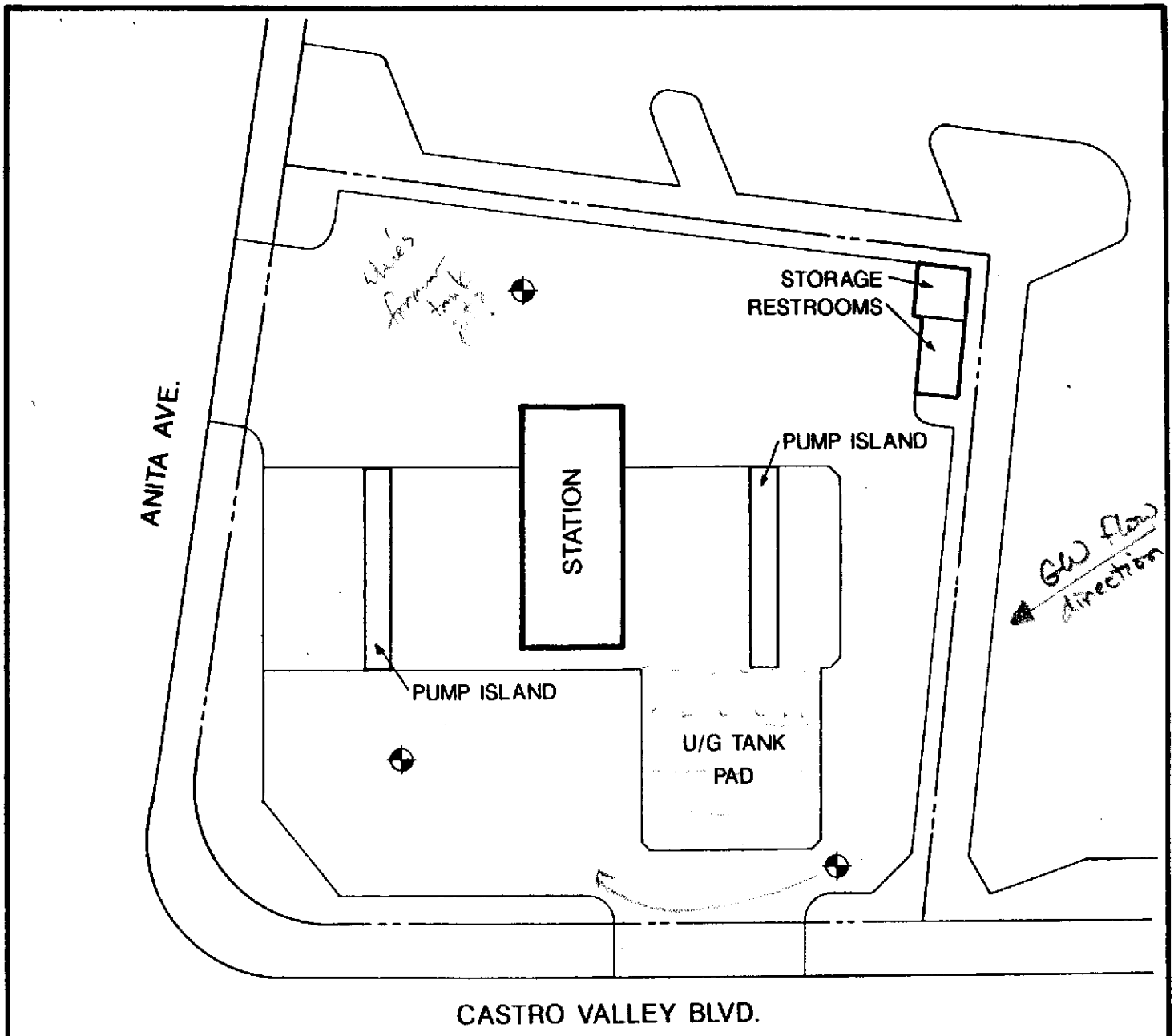
SOIL CORING AND MONITORING-WELL INSTALLATION

Groundwater Technology will supervise the excavation of three, on-site soil corings in the approximate locations shown on Figure 2. The holes will be dug using a man-portable soil-sampling rig that employs a hydraulic sledge hammer to drive 2-inch-diameter by 2 1/2-foot-long steel sampling barrels into the ground.

The barrel is extracted from the ground between each drive and opened, allowing inspection of the continuous soil core sample generated. A Groundwater Technology field geologist will maintain a log of the soils as they are encountered and select samples for laboratory analyses from the total core. How ? Samples retained for analysis will be handled in accordance with Groundwater Technology Standard Operation Procedures (SOPs). Copies of all applicable SOPs are attached in Appendix A.

Samples will be analyzed at the Superior Analytical Laboratories California State-certified facility located in Martinez, California. Soil samples will be analyzed for total petroleum hydrocarbons (TPH)-as-gasoline and for benzene, toluene, ethylbenzene and total xylenes (BTEX), using U. S. Environmental Protection Agency (EPA) Methods 8015/8020. Samples collected adjacent to the former waste-oil tank pit will also be analyzed for total oil and grease (TOG), using EPA Method 5520.

- Need more sample analysis



LEGEND

⊕ PROPOSED MONITORING WELL

N

FIGURE 2
PROPOSED MONITORING WELL LOCATIONS

0 FEET 30

CHEVRON U.S.A.
CASTRO VALLEY, CALIFORNIA

ML 2/91

Due to the anticipated depth to groundwater beneath this site (approximately 10-feet below surface grade), Groundwater Technology proposes to excavate the coring holes to a depth of approximately 15-feet below grade.

The soil coring holes will be completed as groundwater-monitoring wells. The wells will be constructed of 3/4-inch polyvinyl chloride machine-slotted well screen and blank casing. The screened interval of each well will be approximately 10-feet long and a filter pack comprised of No. 2 Monterey Sand will be set in the annular space around the screened interval and extend approximately 1-foot above the top of the well screen. A seal of hydrated, powdered bentonite will be set above the filter pack and the well will be sealed to grade surface with neat cement grout. The wellhead will be capped and encased within a protective, locking street box.

SITE SURVEY

Groundwater Technology will coordinate the performance of a professional survey of the wellhead elevations and locations for the three monitoring wells. This will be scheduled to coincide with well development and sampling activities.

WELL MONITORING, DEVELOPMENT, AND SAMPLING

Concurrent with the site survey, Groundwater Technology will monitor, develop and sample the wells. Monitoring will be accomplished with an electronic slope indicator and this data will be combined with the survey data to determine the groundwater flow gradient.

No!

Development and sampling will be conducted by means of a peristaltic pump. A clean length of Tygon® plastic tubing will be inserted into each well and the well pumped until the water extracted is relatively free of suspended sediments. Groundwater samples will then be taken using standard water sampling procedures (SOPs). Samples will be analyzed for TPH-as-gasoline and BTEX using EPA Methods 5030, 8020 and modified 8015. A water sample from the well adjacent to the waste-oil tank will also be analyzed for TOG using EPA Method 5520.

Is this needed?

REPORT PREPARATION

Groundwater Technology will prepare a technical report presenting the results and findings of this assessment. In addition to describing the site background, project scope of work, and subsurface conditions, the report will include the following:

- Site Location Map and Site Plan
- Groundwater Gradient Map
- Map of Dissolved Petroleum Hydrocarbons, if necessary
- Table of Wellhead and Groundwater Elevations
- Table of Groundwater Analytical Results
- Table of Soil Analytical Results
- Geologic Cross-Section
- Well Logs
- Laboratory Reports

APPENDIX A
GROUNDWATER TECHNOLOGY
STANDARD OPERATION PROCEDURES

GROUNDWATER TECHNOLOGY
STANDARD OPERATING PROCEDURE
CONCERNING WATER SAMPLING METHODOLOGY
SOP 9

Prior to water sampling, each well shall be purged by pumping a minimum of four well volumes or until the discharge water indicates stabilization of temperature, conductivity,and pH. If the well is evacuated before four well volumes are removed or stabilization is achieved, the sample should be taken when the water level in the well recovers to 80% of its initial level.

Retrieval of the water sample, sample handling and sample preservation shall be conducted in accordance with Groundwater Technology Laboratory Standard Operating Procedure (GTL SOP 10) concerning Sampling For Volatiles in Water". The sampling equipment used shall consist of a teflon and/or stainless steel samplers, which meets EPA regulations. Glass vials with teflon lids should be used to store the collected samples.

To insure sample integrity, each vial shall be filled with the sampled water such that the water stands above the lip of the vial. The cap should then be quickly placed on the vial and tightened securely. The vial should then be checked to ensure that air bubbles are not present prior to labeling of the sample. Label information should include a sample identification number, job identification, date, time, type of analysis requested and the sampler's name. Chain-of-Custody forms shall be completed as per Groundwater Technology Laboratory Standard Operating Procedure (SOP 11) concerning Chain of Custody.

The vials should be immediately placed in high quality coolers for shipment to the laboratory. The coolers should be packed with sufficient ice or freezer packs to ensure that the samples are kept below 4C. Samples which are received at the Groundwater Technology Laboratory above 10 C. will be considered substandard. To minimize sample degradation the prescribed analysis shall take place within seven days of sample collection unless specially prepared acidified vials are used.

To minimize the potential for cross contamination between wells, all the well development and water sampling equipment which contacts the groundwater shall be cleaned between each well sampling. As a second precautionary measure, the wells shall be sampled in order of increasing contaminant concentrations as established by previous analysis.

GT ENVIRONMENTAL LABORATORY (GTEL)
STANDARD OPERATING PROCEDURE
CONCERNING SAMPLING FOR VOLATILES IN WATER (DISSOLVED GASOLINE, SOLVENTS, ETC.).
SOP 10

1. Use only vials properly washed and baked, available from GTEL or I-Chem.

2. Use clean sampling equipment. Scrub with Alconox or equivalent laboratory detergent and water followed by a thorough water rinse. Complete with a distilled water rinse.

   Sampling equipment which has come into contact with liquid hydrocarbons (free product) should be regarded with suspicion. Such equipment should have tubing and cables replaced and all resilient parts washed with laboratory detergent solution, as above. Visible deposits may have to be removed with hexane. Solvent washing should be followed be detergent washing as above.

   This procedure is valid for volatile organics analysis only. For extractable organics (for example, pesticides, or base neutrals for EPA method 625) a final rinse with pesticide grade isopropyl alcohol, followed by overnight or oven drying, will be necessary.

3. Take duplicate samples for GTEL. Mark on forms as a single sample with two containers to avoid duplication of analysis.

4. Take a site blank using distilled water or known uncontaminated source. This sample will be run at the discretion of the project manager.

5. Fill out labels and forms as much as possible ahead of time. Use an indelible marker.

6. Preservatives are required for some types of samples. Use specially prepared vials from GTEL, marked as indicated below, or use the appropriate field procedure (SOP 12 for acidification). Make note on forms that samples were preserved. Always have extra vials in case of problems. Samples for volatile analysis should be acidified below pH 2 with hydocloric acid. Use vials with care and keep them upright. Eye protection, foot protection, and disposable vinyl gloves are required for handling. Samples designated for expedited service and analyzed within seven (7) days of sampling will be acceptable without preservation.

   Acid causes burns. Glasses or goggles (not contact lenses) are necessary for protection of the eyes. Flush eyes with water for 15 minutes if contact occurs and seek medical attention. Rinse off hands frequently with water during handling.

   For sampling chlorinated drinking water supplies for chlorinated volatiles, samples shall be preserved with sodium thiosulfate. Use vials labeled "CONTAINS THIOSULFATE". No particular cautions are necessary.

7. Fill vial to overflowing with water, avoiding turbulence and bubbling as much as possible. Water should stand above lip of vial.

8. Carefully but quickly slip cap onto vial. Avoid dropping the teflon septum from cap by not inverting cap until in contact with vial. Disc should have teflon face toward the water. Also avoid touching white teflon face with dirty fingers.

9. Tighten cap securely, invert vial and tap against hand to see that there are no bubbles inside.

10. Label vial using indelible ink as follows:

    a) Sample I.D. No.
    b) Job I.D. No.
    c) Date and Time.
    d) Type of analysis requested.
    e) Your name.

11. Unless the fabric type label is used, place scotch tape over the label to preserve its integrity.

12. For Chain of Custody reasons, sample vial should be wrapped end-for-end with scotch tape or evidence tape and signed with indelible ink where the end of the tape seals on itself. The septum needs to be covered.

13. Chill samples immediately. Samples to be stored should be kept at 4°C (39°F). Samples received at the laboratory above 10°C (as measured at glass surface by a thermocouple probe), after overnight shipping will be considered substandard, so use a high quality cooler with sufficient ice or freezer packs. (Coolers are available from GTEL).

14. Fill out Chain of Custody and Analysis Request form. (See Chain of Custody Procedures SOP 11).

GT ENVIRONMENTAL LABORATORY (GTEL)
STANDARD OPERATING PROCEDURE
CONCERNING CHAIN OF CUSTODY
SOP 11

1. Samples must be maintained under custody until shipped or delivered to the laboratory. The laboratory will then maintain custody. A sample is under custody if:

    a) It is in your possession
    b) It is in your view after being in your possession
    c) You locked it up after being in your possession
    d) It is in a designated secure area

2. Custody of samples may be transferred from one person to the next. Each transferee and recipient must date, sign and note the time on the chain-of-custody form.

3. In shipping, the container must be sealed with tape, bearing the sender's signature across the area of bonding at the ends of the tape in order to prevent undetected tampering. Each sampling jar should be taped and signed as well. Scotch tape works well.

4. Write "sealed by" and sign in the "Remarks" box at the bottom of the form before sealing up the box. Place form in a plastic bag and seal it inside the box.

5. The "REMARKS" section in the upper right part of the form is for documenting details such as:

    a) Correlation of sample numbers if samples are split between labs.
    b) QC numbers when lab is logging in the samples.
    c) Sample temperature and condition when received by lab.
    d) Preservation notation.
    e) pH of samples when opened for analysis (if acidified).
    f) Sampling observation or sampling problem

6. The chain-of-custody form should be included inside the shipping container. A copy should be sent to the project manager.

7. When the samples are received by the lab, the chain-of-custody form will be dated, signed, and a note of the time made by a laboratory representative. The form along with shipping bills and receipts will be retained in the laboratory files.

8. At the time of receipt of samples by the laboratory, the shipping container will be inspected and the sealing signature will be checked, the samples will be inspected for condition and bubbles and the temperature of a representative sample container will be measured externally by a thermocouple probe (held tightly between two samples) and recorded. The laboratory QC numbers will be placed on the labels, in the accession log, and on the chain-of-custody form. If samples are acidified their pH will be measured by narrow range pH paper at the time of opening for analysis. All comments concerning procedures requiring handling of the samples will be dated and initialed on the form by the laboratory person performing the procedure. A copy of the completed chain-of-custody form with the comments on sample integrity will be returned to the sampler.

GT ENVIRONMENTAL LABORATORY (GTEL)
STANDARD OPERATING PROCEDURE
CONCERNING FIELD PRESERVATION OF BTX SAMPLES
BY ACIDIFICATION
SOP 12

If specially prepared acidified vials are not available, apply the following Field Procedures, using the field acidification kit. The kit contains:

a) 500 cc glass measuring cup or breaker.
b) dropping bottle of 50% hydrocloric acid or nitric acid.
c) narrow range pH paper, 1.0-2.5 pH range.
d) glass stirring rod.

1. Collect approximately 300cc of water in beaker. Try to minimize turbulence, bubbling, and time of exposure to the air.

2. For inorganic analysis: use 50% nitric acid
For volatile organic analysis: use 50% hydrocloric acid
Add 30 drops of 50% acid to measuring cup. Hold dropper completely vertically.

3. Gently mix with glass bar.

4. Remove bar and touch wetted tip to the pH paper and check color code to assure it is below pH 2. As more acid is added the pH goes lower. Discard used pH strip.

5. Add more acid if necessary. Too much acid is not a problem, just record how much was added (this will be helpful next time). Don't waste time trying to get it right - just add plenty of acid to get it below pH 2. Ideally, once you know how much acid needs to be added at one well, that amount will be sufficient for the rest. However, test the pH each time.

6. Pour the water into the vials prepared for that well and cap off with no bubbles inside. Again turbulence and bubbling are to be minimized. Also note that it is important that all of the vials for a given well be poured and sealed one right after another. Make sure the 300cc collected is enough to fill all of the vials with some to spare at the end. The volume collected can be increased but remember to proportionally increase the amount of acid added.

7. Acidification does not replace chilling. Always chill samples and ship via air for next day delivery.

8. Acid causes burns. Glasses or goggles (not contacts) are necessary for protection of the eyes. Wash eyes with fresh water for 15 minutes if contact occurs and seek medical attention. Rinse off hands frequently with water during sampling.

GROUNDWATER TECHNOLOGY
STANDARD OPERATING PROCEDURE
CONCERNING MONITORING WELL INSTALLATION
SOP 13

The boreholes for the monitoring wells shall be drilled using a truck mounted hollow stem auger drill rig. The outside diameter (O.D.) of the auger should be a minimum of eight inches when installing 4-inch well screen. The hollow stem auger provides minimal interuption of drilling while permitting soil sampling at specific intervals. Soil samples can be taken at desired depths by hammering a conventional split barrel sampler containing precleaned 2 inch brass sample tubes.

The construction details of the monitoring wells to be drilled at the site are graphically depicted in the attached figure titled "Typical Detail of Monitoring Well Construction" (See Figure 1). The wells should be constructed of 4 inch PVC, .020 inch machine slotted screen and blank casing. The screened portion of the well will extend 5 feet above and 10 feet below the present water table. An appropriate sand pack as determined by grain size analysis shall be placed in the annular space between the casing and drilled hole to inhibit silt buildup around the well. An annular seal installed above the sand pack should consist of bentonite pellets overlain by neat cement or cement grout to the surface. The wellhead shall be protected below grade within a traffic rated street box. Each well shall have a permanently attached identification plate containing the following information (1) Well Number, (2) Wellhead Elevation, (3) Depth of Well, (4) Screened Interval.

Subsequent to installation the wells shall be developed to remove silts and improve well performance. The well development shall be conducted by air lifting the water within the well until groundwater pumped from the wells is silt free.

To assure that cross contamination does not occur between the drilling and development of successive wells all equipment contacting subsurface soils or ground water shall be steam cleaned. The steam cleaned equipment should include but not limited to the following (1) Drilling Augers, (2) Split Barrel Sampler, (3) Groundwater Monitoring and Sampling Equipment, (4) Well Development Piping and Sparging Equipment.

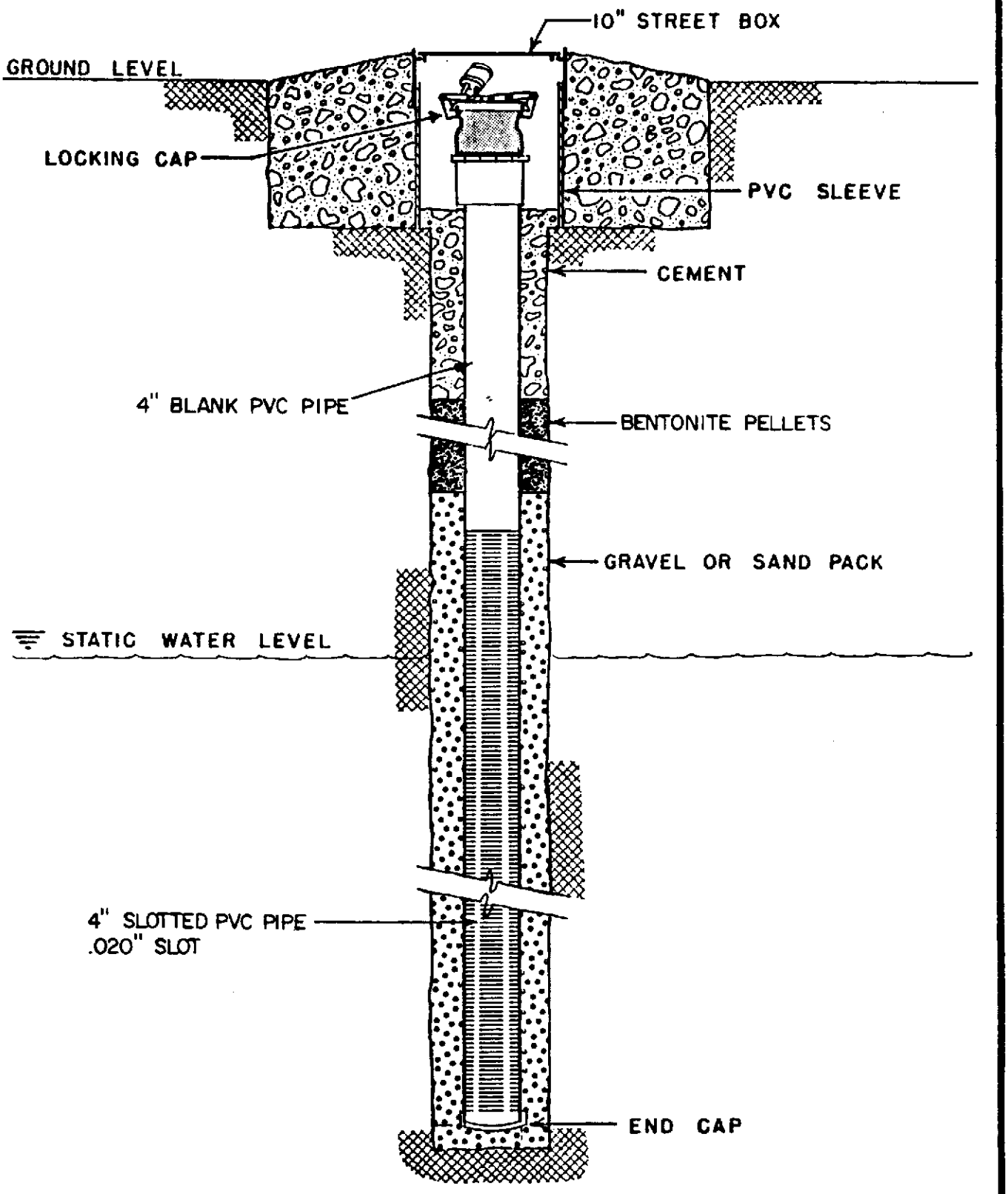


FIGURE I

TYPICAL DETAIL
MONITORING WELL CONSTRUCTION

GROUNDWATER TECHNOLOGY
STANDARD OPERATING PROCEDURE
CONCERNING SOIL SAMPLING METHODOLOGY
SOP 14

Soil samples should be collected and preserved in accordance with Groundwater Technology Laboratory's Standard Operating Procedure (GTL SOP 15) concerning Soil Sample Collection and Handling when Sampling for Volatile Organics. A hollow stem soil auger should be used to drill to the desired sampling depth. A standard 2 inch diameter split spoon sampler 18 inches in length shall be used to collect the samples. The samples are contained in 2 inch diameter by 6 inch long thin walled brass tube liners fitted into the split spoon sampler (three per sampler).

The split spoon sampler should be driven the full depth of the spoon into the soil using a 140 pound hammer. The spoon shall then be extracted from the borehole and the brass tube liners containing the soil sample removed from the sampler. The ends of the liner tubes should be immediately covered with aluminum foil, sealed with a teflon or plastic cap, and then taped with duct tape. After being properly identified with sample data entered on a standard chain of custody form the samples shall be placed on dry ice (maintained below 4°C) and transported to the laboratory within 24 hours.

One of the three soil samples retreived at each sample depth shall be analyzed in the field using a photoionization detector and/or explosimeter. The purpose of the field analysis is to provide a means to choose samples to be laboratory analyzed for hydrocarbon concentrations and to enable comparisions between the field and laboratory analyses. The soil sample shall be sealed in a plastic bag and placed in the sun to accelerate the vaporization of volatile hydrocarbons from the soil. One of the two field vapor instruments shall be used to quantify the amount of hydrocarbon released to the air from the soils. The data shall be recorded on the drill logs at the depth corresponding to the sample point.

GROUNDWATER TECHNOLOGY, INC.
STANDARD OPERATING PROCEDURE
CONCERNING SOIL SAMPLE COLLECTION AND
HANDLING WHEN SAMPLING FOR VOLATILE ORGANICS
SOP 15

1. Use a sampling means which maintains the physical integrity of the samples. The project sampling protocol will designate a preferred sampling tool. A split-spoon sampler with liners, or similar tube sampler which can be sealed, is best.

2. At the discretion of the project manager, the samples should be either.

   A. Sealed in liner with Teflon^{R} plugs (The "California Sampler") or

   B. Field-prepped for sample analysis.

   Projects using method "A" will incur a separate sample preparation charge of $10.00 per sample in the laboratory. For method "B", prepared and pre-weighed vials, and sample-coring syringes must be ordered at least two weeks ahead of time from the laboratory before sampling. (Vials are free if samples will be sent to Groundwater Technology Laboratory).

3. For sending whole-core samples (2A above):

   A. Seal ends of liner with Teflon^{R} tape or aluminum foil leaving no free air space inside.

   B. Tape with duct tape.

   C. Place in plastic bag labeled with indelible marker. Use well number, depth, date, and job number.

   D. Place inside a second bag and place a labelling tag inside outer bag.

   E. Enclose samples in a cooler with sufficient ice or dry ice to maintain samples at 4 celsius during shipment.

   F. Seal cooler with a lock or tape with samplers' signature so tampering can be detected.

G. Package cooler in a box with insulating material. Chain-of-custody forms can be placed in a plastic bag in this outer box.

H. If dry ice is used, a maximum of five pounds is allowed by Federal Express without special documents (documents are easy to obtain, but just not necessary for under five pounds). Write "ORM-A dry ice, UN-1845,_____ pounds, on the package. On the airbill under "Delivery and Special Handling" check item 6, (dry ice). Lastly, place the number of pounds of dry ice in the blank in item 6. UPS does not accept dry ice in air freight.

I. Make yourself a necessary supplies list before going into the field.

J. Soil cores kept at 4 degrees celsius are only viable for up to 7 days when aromatic hydrocarbons are involved. The lab will prepare them in methanol following procedures above once in the lab, but it is necessary to call ahead of time to schedule personnel.

4. For field-prepping (Step 2B above):

A. Obtain prepared sample containers from the laboratory. Order enough for number of samples intended and add 50 percent. This should be sufficient for Quality Assurance (QA) requirements (below), breakage, and additional samples taken by discretion of sampler.

B. Organize containers consecutively, they are all numbered and pre-weighed. Make a necessary supplies list before going into the field.

C. For a 6-inch liner section retrieved from the spoon sampler, spread a 12-inch square piece of broiler (heavy) aluminum foil and slice it lengthwise with a clean stainless-steel spatula.

D. Immediately sample with a coring syringe with plunger removed. Poke tube into mid-section of core (into undisturbed soil) to capture a 1/2-to 1-inch plug.

CAUTION: WORK ONLY IN WELL VENTILATED AREA. DO NOT BREATHE METHANOL VAPOR. IT IS TOXIC. SEE MSDS ATTACHED.

E. Immediately transfer plug to the sample vial with methanol by using plunger. Clean around lip of vial to remove soil with clean laboratory paper toweling and seal septum onto the vial with lid, Teflon^{R}-side (shiny) toward the sample. Shake sample enough to break it up so that whole sample is immersed in methanol. The rapid progression of steps indicated here is necessary to prevent loss of volatiles from the soil. Do not leave vials unopened for any extended period - the methanol evaporates quickly. Grit left on threads of vial can cause vial to break.

F. * If required (see 5 below). Take a duplicate sample from the other half directly across from the first sample, or wherever undisturbed, yet representative soil occurs.

G. Label vial with legible information as follows:

1. Job name or number.
2. Date.
3. Time.
4. Depth and well number.
5. Samplers initials.

H. Tape vial across septum with Scotch tape and around cap and sign on the tape with indelible ink to prevent tampering.

I. Wrap up a representative section of the core equivalent in volume to cube three centimeters on a side in the aluminum foil square, discarding the rest appropriately. Seal in Saran wrap. This section is for dry-weight determination. Close it in plastic bag with a tag or write on the bag with an indelible marker. These samples go into a separate cooler or box and not with the vials. The cooler for dry-weight samples need not be iced, but overnight delivery is requested.

J. Discard plastic-coring syringe, clean the spatula, and get clean equipment ready for next sample.

K. Ice the sample vials immediately and keep them iced through shipment.

L. Fill out chain-of-custody form. SOP 11 gives major details. Make sure sample requests is for proper analysis type.

M. Shipping of hazardous materials (methanol) requires special documents from Federal Express and UPS. Briefly you will need to add following to outside of package and on documents:

1. Flammable liquid label (some will come from lab with the vials).

2. "UN1230 methyl alcohol".

3. For UPS, a "Hazardous Material" label.

N. Ship overnight delivery to the lab. If dry ice is available, up to 5 pounds per package can be sent via Federal Express by simply writing "ORM-A dry ice, _____ pounds, for research" on outside of package and on shipping document. UPS does not accept dry-ice shipments.

5. Good sampling practice would include preparing one out of five samples to be prepared in duplicates for analysis. These four out of twenty samples will be for the following purposes:

A. One in every twenty samples should be analyzed as a field replicate to evaluate the precision of the sampling technique. A minimum of one sample per data set is suggested.

B. An additional one in twenty samples should be selected by sampler to be prepared in duplicate as alternative to Step (A). Choose a different soil type if available.

C. The lab does spiking with reference materials for internal Quality Control (QC) so additionally a minimum of two in twenty samples need to be prepared in duplicate.

6. Other QC procedures can be specified at the project manager's discretion. See Table 3-2 (reference 2) attached.

7. Decontamination of equipment in the field requires a detergent wash, a water rinse, and spectrographic quality acetone rinse followed by distilled water.

REFERENCES

1. Soil Sampling Quality Assurance Users Guide, USEPA Environmental Monitoring Systems Laboratory, Las Vegas, NV, EPA 600/4-84-043, May 1984.

2. Preparation of Soil Sampling Protocol. Techniques and Strategies, USEPA, Environmental Monitoring Systems Laboratory, Las Vegas, NV, EPA 600/4-83-020, August 1983 (PB83-206979).

3. Test Methods for Evaluating Solid Waste, USEPA, Office of Solid Waste and Emergency Response, Washington, D.C., SW 846, July 1982.