



05

can SV samples just be compared w/ Tables from RWQCB or does it need to be run through RBCA? If it passes for indoor air, surely it wouldn't be a problem for ambient air

CITY OF OAKLAND



DALZIEL BUILDING • 250 FRANK H. OGAWA PLAZA, SUITE 5301 • OAKLAND, CALIFORNIA 94612

Public Works Agency
Environmental Services

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October 1, 1998

Ms. eva chu
Alameda County Environmental Health Services
1131 Harbor Bay Parkway
Alameda, California 94502

Dear Ms. chu:

**Subject: Work Plan for Soil Vapor Sampling and Health Risk Assessment,
670 98th Avenue, Oakland, California**

does it exceed
10⁻⁵ risk too?

Enclosed please find a work plan for soil vapor sampling and health risk assessment for the subject site prepared by our consultant, Baseline Environmental. As we have discussed, the "hot spot" concentration discovered during the well point sampling conducted in September 1997, results in an RBCA Tier I indoor air health risk that may exceed a 10⁻⁶ risk level. The enclosed work plan proposes to collect and analyze soil-gas samples for the chemicals of concern. The results, along with site-specific physical characteristics of the soil, will be used directly as input parameters for a RBCA Tier II health risk evaluation thereby providing a more accurate assessment of potential health risk associated with the site.

Please review and provide your comments on the work plan at your earliest convenience. The City is prepared to authorize our consultant to proceed upon receipt of your approval.

Please call me at 238-7695, if you have any questions or require additional information.

Sincerely,

Mark B. Hersh
Environmental Program Specialist

cc: Andrew Clark-Clough
Kevin O'Dea, Baseline Environmental

BASELINE

ENVIRONMENTAL CONSULTING

15 September 1998
93343-F2

Mr. Mark Hersh
City of Oakland
Environmental Services
250 Frank H. Ogawa Plaza, Suite 5301
Oakland, CA 94612

Subject: Work Plan for Soil Vapor Sampling and RBCA Tier II Health Risk Evaluation, 670 98th Avenue, Oakland, California

Dear Mark:

This letter presents a work plan developed by BASELINE to address remaining issues concerning the environmental conditions at and in the vicinity of the City-owned property at 670 98th Avenue in Oakland.

The project site is the location of a former service station at which past soil and groundwater investigations have indicated the release of petroleum hydrocarbons. These investigations, which began in 1990, have documented the presence of a relatively well-defined area of groundwater affected by petroleum hydrocarbons and associated aromatic hydrocarbons downgradient of former underground storage tank locations (Figure 1). In addition, groundwater in the area surrounding the site, including upgradient positions, has been affected by the release of chlorinated hydrocarbons. The source of this release is not known.

Currently, it is not known if the presence of aromatic and chlorinated hydrocarbons present a potential adverse impact on human health. Comparison of the highest levels of benzene and tetrachloroethene detected in groundwater at and near the site in September 1997 with the risk-based screening levels (Tier 1) indicated that these levels may represent health risks exceeding 10^{-6} under the exposure pathway of volatilization from groundwater to indoor air. Although the 10^{-6} risk level appears to be exceeded for that pathway, the fate and transport modeling included in the RBCA methodology is generally considered to be very conservative and may significantly overestimate the actual exposure to contaminants that have volatilized from soil or groundwater. In addition, site-specific conditions, including clayey near-surface soils, may attenuate the migration of volatile contaminants to the surface and buildings.

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The purpose of this work plan is to develop the information necessary to accurately evaluate the health risks associated with the conditions at and adjacent to the project site. The work plan proposes to collect actual soil vapor concentrations in the shallow soils at the site and additional physical soil data to perform a health risk assessment. The following sections describe the proposed components of the work plan.

Soil Vapor Sampling

To provide additional site-specific data for the evaluation of health risks at the site, active sampling of shallow soil gas will be performed. Soil vapor samples will be collected at the locations shown in Figure 1. The sampling locations have been chosen on the basis of identification of a "hotspot" of petroleum hydrocarbon and aromatic hydrocarbon compounds in groundwater at well point location WP-8 in September 1997. The results of groundwater sampling at this and surrounding locations suggest that this area may be located in the central portion of affected groundwater that has migrated downgradient from the former service station site at 670 98th Avenue. Therefore, soil gas sampling at this location would conservatively represent "worst case" conditions. In addition, one soil vapor sample will be collected adjacent to the location of monitoring well MW-4. Groundwater data collected in September 1997 indicated that this was the location of the highest concentrations of tetrachloroethene (0.047 mg/L) and total chlorinated hydrocarbons (0.0497 mg/L).

At each sampling location, soil vapor samples will be collected by advancing a vapor sampling probe using a "direct push" (Geoprobe) sampling rig. Following advancement of the probe to a depth of 3.0 feet, the probe will be retracted approximately six inches to expose the sampling interval, leaving an expendable drive tip at the bottom of the boring. Next, clean 1/4-inch polyethylene tubing will be inserted through the drilling rods (Geoprobe Post Run Tubing System) and into an adapter at the bottom of the drilling rod. The tubing is fitted with an in-line flow regulator and the top of the tubing is connected to a vacuum/volume system pump. The pump is used to extract soil vapor at a controlled rate of 200 cubic centimeters per minute. Prior to sample collection, three tube volumes will be purged. Following tube purging, the top of the tubing will be connected to a six-liter Summa sampling cannister. The vacuum system will be engaged and used to fill the Summa cannister in accordance with the capacity requirements. The air samples will be submitted under chain-of-custody to a state-certified laboratory for analysis of aromatic hydrocarbons and chlorinated hydrocarbons (EPA Method T014).

Upon completion of sampling at each location, all drilling and sampling equipment will be decontaminated by steam cleaning. Soil cuttings and rinsate generated by decontamination activities will be stored at the project site in sealed steel containers. All borings will be grouted to the full depth with cement-bentonite grout.

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Soil may need to be collected from one boring - preferably from a 'clean' boring assuming lithology at both sides of 98th Ave are similar.

Soil Sampling

To more accurately characterize the shallow soil conditions at the project site, additional soil samples will be collected for the purpose of defining physical soil parameters affecting fate and transport of detected residual chemicals. The soil samples will be collected with the direct push sampling rig during advancement of the boring made for collection of soil vapor samples. One soil sample will be collected from each boring at a depth of 2.0 to 2.5 feet. The samples will be submitted to Cooper Testing Laboratories for analysis of bulk density, total porosity, moisture content, grain size analysis, and total organic carbon fraction.

RBCA Evaluation

The site-specific data collected during the additional investigation, proposed in this work plan, and previous investigations conducted at and surrounding the project site will be used to perform a Tier 2 Risk-Based Corrective Action (RBCA) evaluation to determine human health risks. The evaluation will follow the American Society of Testing and Materials (ASTM) Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites (E 1739-95) and will assume residential use of the project site. Target additional health risk goals of 10^{-5} and 10^{-6} will be evaluated and site-specific target levels (SSTLs) will be established for all chemicals of concern (COC). The following exposure pathways will be evaluated:

- ingestion, inhalation, and dermal contact with surface soils;
- volatilization from soil to indoor air;
- volatilization from soil to outdoor air;
- volatilization from groundwater to indoor air;
- volatilization from groundwater to outdoor air.

*- is this a complete exposure pathway?
or is this for construction workers*

The ASTM methodology will be modified, however, to incorporate the results of direct measurement of contaminant concentrations in soil vapor. Under this modification, the soil vapor results will be substituted for the fate and transport modeling and calculated soil vapor parameters presented in the ASTM guidance. In effect, the soil vapor results are evaluated as the source of contamination rather than relying on expected soil vapor values estimated from soil and groundwater concentrations. However, it will still be necessary to calculate the maximum diffusive vapor flux using the measured soil vapor concentrations to determine the calculated outdoor ambient air and enclosed space air concentrations for each chemical of concern.

The additional sampling proposed in this work plan will be performed under the required Drilling Permit issued by the Alameda County Public Works Agency. Prior to commencement of subsurface

BASELINE


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drilling, Underground Service Alert will be contacted to determine the potential presence of utilities at the proposed sampling locations.

The results of the soil and soil vapor sampling and testing and the RBCA Tier 2 evaluation will be used to determine if remediation of the site and surrounding areas is necessary to protect human health. If the RBCA evaluation indicates that the target health risk is not exceeded, a request for site closure will be prepared and submitted to the Alameda County Department of Environmental Health and the San Francisco Bay Regional Water Quality Control Board.

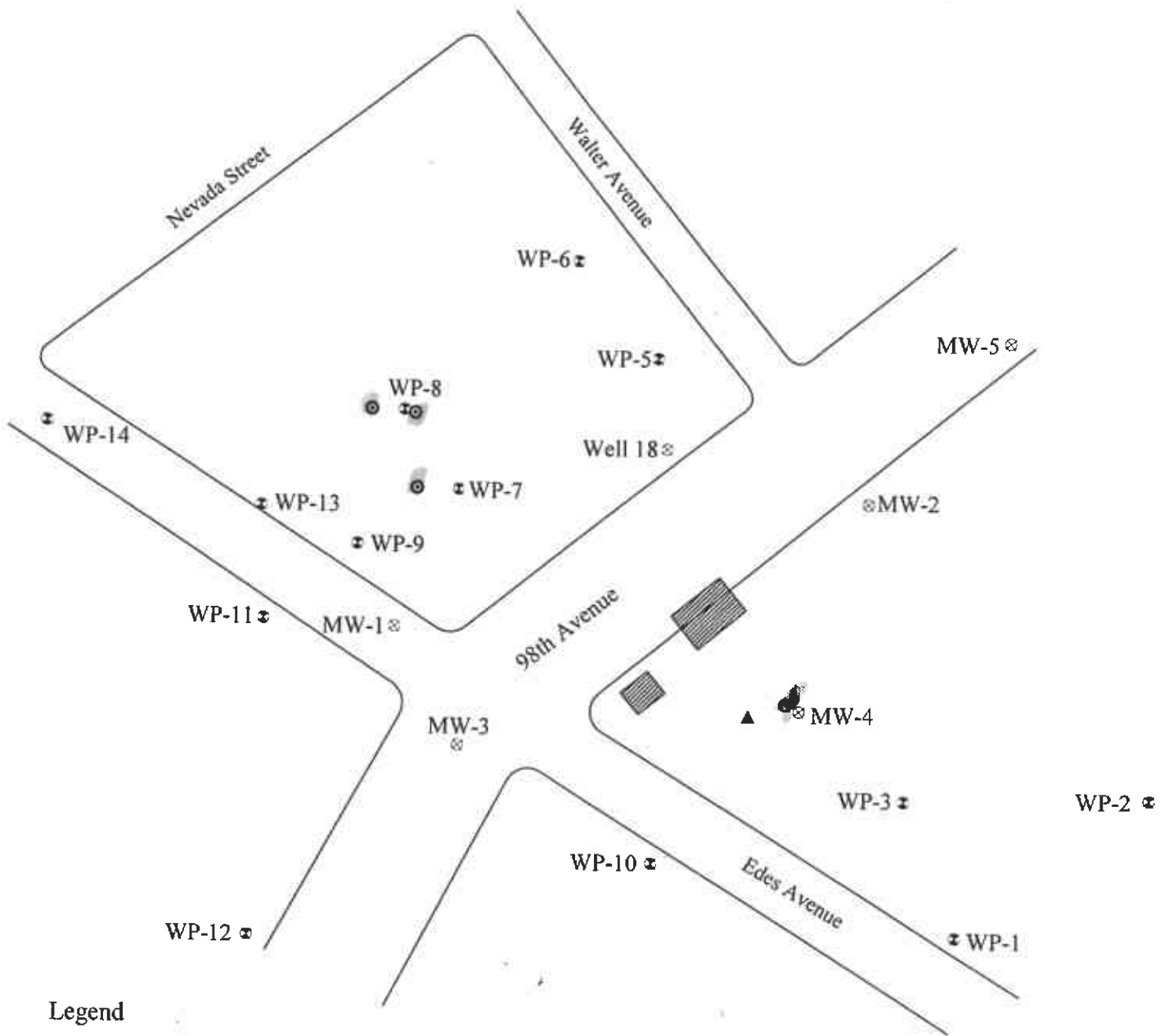
If you have any questions or comments regarding this work plan, please call us at your convenience. A copy of this work plan should be submitted to Eva Chu of the ACDEH and Ravi Arulanantham of the SFBRWQCB for comment and approval.

Sincerely,


Yane Nordhav
Principal
Reg. Geologist No. 4009

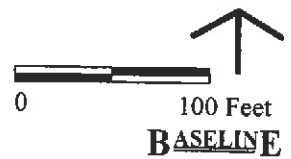

Kevin O'Dea
Vice President

YN:KOD:cr



Legend

- MW-1 ⊙ Monitoring Well
- WP-1 ⊕ Well Point Location
- SG-1 ● Proposed Soil Vapor Sampling Location
- ▨ Former Gasoline Tank Location
- ▲ Former Waste Oil Tank Location



Base map source: Applied Geotechnology Inc., 7-93.

D:\Graphics\93343F\site plan.vcd 8/24/98