



Alameda County Health Care Services Agency  
Department of Environmental Health  
Hazardous Materials Division  
1131 Harbor Parkway  
Alameda, CA 94502-6577

May 25, 2001

Attention: Mr. Don Hwang

Subject: **Revised Risk Evaluation Report**  
**Grace Auto Repair, 2504 MacArthur Boulevard, Oakland, CA 94602**

Dear Mr. Hwang:

This revised report addresses the comments in your letter dated May 9, 2001, in which you requested an evaluation of the risk to human health and the environment posed by groundwater. This issue is addressed in section C of this revised report.

Reference is made to your letter dated February 6, 2001 that was issued in response to our report titled "Collection & Chemical Analysis of Grab Groundwater Samples, 2504 MacArthur Boulevard, Oakland, California", revised December 2000. You requested justification as to why additional wells screened for a groundwater depth of 10 ft. are not needed. You also requested an evaluation of the risk to human health and the environment from the residual contaminants on site. In our letter of April 26, 2001 we briefly discussed the current site conditions and stated why additional monitoring wells screened for groundwater depth of 10 feet is not justified. This letter is a follow up to our previous letters, and a comprehensive response to your comments. We hope it satisfies all your requirements.

**A. Validity of Existing Groundwater Quality Measurements for Site Closure.**

1. There are three groundwater monitoring wells on site. The wells were installed in 1995 and are screened as follows:

- Monitoring well MWB-1 is screened from 31 feet below ground surface (bgs) to 41.5 feet bgs.
- Monitoring well MWB-2 is screened from 25 feet bgs to 35 feet bgs.
- Monitoring well MWB-5 is screened from 15 feet bgs to 30 feet bgs.

In each well the sand pack exists two feet above the top of screen. As an example, in well MW-5, the well is exposed to groundwater from 13 feet bgs to 30 feet bgs. A plane surface can be drawn through the subsoil that intersects all three well screens, therefore, the hydraulic gradient derived from the water levels in the wells are considered reliable.

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2. As you are aware, during well installation, the depth over which the well screen is normally placed is based on the occurrence of water-bearing strata as observed during drilling operations. Typically a sandy strata will be water bearing. A review of the boring logs for wells MW-B1, MW-B3 and MW-B5 indicates that the site is overlain by a relatively tight strata of silty clay, interbedded with thin discontinuous strata of sandy material down to about 24 feet below ground surface (bgs). The sand content appears to increase beyond 24 feet bgs. It is fair to say that free groundwater was not encountered at the site above 24 feet bgs during drilling operations. We acknowledge that the groundwater levels in the three wells are at approximately 10 feet bgs on average, but the boring logs appear to indicate that this elevation is not the phreatic (free water) groundwater surface at the site. The water rose up in the borings, which is normally an indication that the groundwater at the site is under a hydrostatic head. The 10 feet bgs water level in the monitoring wells appear to be related to the potentiometric groundwater surface in the vicinity of the site. This situation is not uncommon in the heterogeneous subsoils of the San Francisco Bay Area.

3. You made reference to the groundwater conditions during construction of well MWB-5. In boring B-5, the boring was stopped initially at 20 feet in dry conditions, due to mechanical breakdown. After a few days, the groundwater was observed to rise up to 10 feet bgs. A feasible explanation for the delayed occurrence of water in the shallower boring B-5 at 20 feet bgs is the presence of the "interbedded thin sand layers" at 18.5 feet bgs as reported on the boring log. From the logs, it can be deduced that the interbedded sand layers are discontinuous. It is generally understood that, normally, air trapped in the pores between soil particles within a relatively tight formation impedes and eventually suppresses the interlinking of the soil pores containing water. However, once the vadose zone is penetrated, the trapped air either escapes to the atmosphere or is forced out by the hydrostatic pressure. The result is that the pores containing water are allowed to link up and drain freely. The freed water will eventually stabilize at the piezometric head. We expect that water held in the capillary zone would be released by puncturing the vadose zone.

4. If additional wells were screened at shallower depths, then residual contamination in the soil, however small, would most likely leach into the well water and potentially contaminate the groundwater. Therefore, shallower screened wells could potentially act as a conduit for deeper penetration of the residual contaminants in the soil.

5. Groundwater samples taken from the three wells in 1996 and more recently in 1999 indicate that the hydrocarbon pollutants THH-D, TPH-G, and BTEX have not been detected in the groundwater. This is a strong indication that the residual contaminants in the soil have not impacted the groundwater.

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6. The groundwater concentrations on site are representative of the quality of the groundwater at the site because they measure the quality of the formation water in the zones where formation water occurs. Therefore we believe that the groundwater data is valid for the purpose of site closure.

**B. Evaluation of Risk to Human Health and the Environment.**

Based on a review of the *Oakland Urban Land Redevelopment Program Guidance Document*, we believe that the site qualifies for the Oakland Tier 1 Risk Based Screening Levels (RBSLs). A copy of the completed Oakland RBCA Eligibility Checklist is attached.

Tier 1 Risk Evaluation:

a. Chemicals of Concern:

The chemicals of concern at the site are the fuel constituents benzene, ethylbenzene, toluene, and xylenes. The ULR Program does not currently have risk levels for the composites TPH-D and TPH-G.

b. Exposure Pathways of Concern:

1. As described above, the groundwater has not been impacted by the release of contaminants on-site. Low levels of contaminants were encountered in grab groundwater samples that were collected in 1999. However, the procedure for obtaining grab groundwater samples usually allows some soil contaminants to impact the groundwater. The contaminants of concern have not been detected in the formation water in the monitoring wells.
2. The site is contained in a developed area. There is no obvious pathway for impact with water used for recreation.
3. Surficial soil over the impacted area was excavated from the site during implementation of Corrective Action Plan (CAP).
4. The source of potential contaminants on site is the residual contaminants in the subsoil that are contained below the surficial soil and above the groundwater. There is a commercial business concern on site. The exposure pathway most appropriate to the site is inhalation of indoor air vapors.

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c. Land Use Scenario:

The site is used for commercial purposes only. Currently, there is no plan for redevelopment of the property.

d. Containment Measures:

The site is currently occupied by a building that contains a thick concrete floor. The exterior is overlain with an asphalt concrete surface.

e. Tier 1 RBSL Concentrations:

Reference the Oakland Tier 1 RBSLs, Table 5, of the *Oakland Urban Land Redevelopment Program Guidance Document*. As described above, the parameters in the table that are appropriate to the site are as follows:

The medium = subsurface soil  
Exposure pathway = inhalation of indoor air vapors  
Land use = commercial/industrial  
Type of risk = carcinogenic

Based on these parameters the Tier 1 RBSL for benzene is 1.1 **mg/kg**. The maximum level of benzene remaining in soil on the site is **0.4 mg/kg** (1995 soil excavation, sample SW-5). Therefore, benzene levels fall below the Tier 1 RBSL.

The Tier 1 RBSL for ethylbenzene exceeds the saturated soil concentration for ethylbenzene. The maximum level of ethylbenzene remaining in soil on site is **5.4 mg/kg** (1996 soil excavation, sample S-7). Therefore, ethylbenzene levels fall below the Tier 1 RBSL.

The Tier 1 RBSL for toluene exceeds the saturated soil concentration for toluene. The maximum level of toluene remaining in soil on site is **18 mg/kg** (1995 well installation, boring B-3-5). Therefore, toluene levels fall below the Tier 1 RBSL.

The Tier 1 RBSL for xylenes exceeds the saturated soil concentration for xylenes. The maximum level of xylenes remaining in soil on site is **3.1 mg/kg** (1996 soil excavation, sample S-7). Therefore, xylenes levels fall below the Tier 1 RBSL.

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**C. Evaluation of Risk to Human Health and Environment from Groundwater.**

Pursuant to your request by letter dated May 9, 2001, the following addresses the risk to human health and the environment posed by groundwater.

A summary of groundwater quality observations at the site follows. During the site investigation in 1995, the three monitoring wells MW-B1, MW-B3, and MW-B5 were sampled and tested for TPH-G, and BTEX constituents. Low levels of pollutants were encountered in the groundwater. Additional excavation of contaminated soil at the site was performed in 1996. Subsequent to the additional soil excavation, the wells were sampled in 1996 and the TPH-G and BTEX constituents were "non-detect." In December 1999, the three wells were again sampled and tested, and the constituents TPH-G and BTEX were "non-detect." Trace levels of metals were encountered in well MW-5. During the December 1999 sampling, three *Geoprobe*<sup>®</sup> borings were used to collect grab-groundwater samples, and some pollutants were encountered in the grab-groundwater samples.

Reference is made to the Oakland Tier 1 RBSLs, Table 5, of the *Oakland Urban Land Redevelopment Program Guidance Document*. As described previously, the exposure pathway most appropriate to the site from groundwater is by volatilization of the pollutants and inhalation of indoor air vapors. The parameters in Table 5 that are appropriate to the risk from groundwater at the site are as follows:

The medium = groundwater  
Exposure pathway = inhalation of indoor air vapors  
Land use = commercial/industrial  
Type of risk = carcinogenic

Based on these parameters, the Tier 1 RBSL for benzene in groundwater is **1.8 mg/l**. The maximum level of benzene encountered in groundwater at the site is **0.071 mg/l** (1999 sample SB-1, grab-groundwater sample). Therefore, benzene levels fall below the Tier 1 RBSL.

The Tier 1 RBSL for toluene in groundwater exceeds the solubility of toluene in water. The maximum level of toluene encountered in groundwater at the site is **0.074 mg/l** (1995 groundwater sample from well MW-B3). Therefore, toluene levels fall below the Tier 1 RBSL.

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The Tier 1 RBSL for ethylbenzene in groundwater exceeds the solubility of ethylbenzene in water. The maximum level of ethylbenzene encountered in groundwater at the site is **0.012 mg/l** (1999 grab-groundwater sample SB-1). Therefore, ethylbenzene levels fall below the Tier 1 RBSL.

The Tier 1 RBSL for xylenes in groundwater exceeds the solubility of xylenes in water. The maximum level of xylenes encountered in groundwater at the site is **0.023 mg/l** (1995 sample from well MW-B3, and 1999 grab-groundwater sample SB-1). Therefore, xylenes levels fall below the Tier 1 RBSL.

The trace metals **cadmium, chromium, nickel, lead, and zinc** were encountered in the sample from well MW-B5 in the December 1999 monitoring episode. Trace metals in groundwater are not volatile, and as such, pose no threat to human health and the environment. The only possible pathway by which exposure to the trace metals can occur is through ingestion of groundwater. This exposure is unlikely as the site is paved with concrete and asphalt. However, for completeness, we will compare the RBSLs for an assumed exposure pathway of "ingestion of groundwater."

Reference is made to the Oakland Tier 1 RBSLs, Table 5, of the *Oakland Urban Land Redevelopment Program Guidance Document*.

The medium = groundwater  
Exposure pathway = ingestion of groundwater  
Land use = commercial/industrial  
Type of risk = carcinogenic

Based on these parameters, the Tier 1 RBSL for cadmium in groundwater is **0.005 mg/l**. Cadmium was "non-detect" in the 1999 sample from MW-B5. Therefore, cadmium levels fall below the Tier 1 RBSL.

The Tier 1 RBSL for chromium in groundwater is **0.05 mg/l** (chromium VI). The concentration of total chromium in the 1999 sample from MW-B5 is **0.022 mg/l**. Therefore, chromium levels fall below the Tier 1 RBSL.

The Tier 1 RBSL for nickel in groundwater is **0.1 mg/l**. The concentration of nickel in the 1999 sample from MW-B5 is **0.078 mg/l**. Therefore, nickel levels fall below the Tier 1 RBSL.

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The Tier 1 RBSL for tetraethyl lead in groundwater is **0.015 mg/l**. The concentration of total lead (LUFT Metal) in the 1999 sample from MW-B5 is **0.054 mg/l**. The tables do not have a RBSL for total lead. Poor-quality groundwater that occurs within thin, discontinuous buried channels is not used as the source of drinking water within the City of Oakland. Further, the concentration of total lead in the water sample is sufficiently small that it can be assumed to pose no risk.

The Tier 1 RBSL for zinc in groundwater is **31.0 mg/l**. The concentration of zinc in the 1999 sample from MW-B5 is **0.16 mg/l**. Therefore zinc levels fall below the Tier 1 RBSL.

The above analysis shows that no significant risk is posed to human health and the environment from groundwater at the site.

Based on the above analysis, and on behalf of the owner, Mr. Michael Marr, we request that the County grant site closure. An Oakland RBCA Cover Sheet accompanies this request for site closure.

Very truly yours,  
**Ingram Mason & Fairbairn**  
A Division of IMFC Corporation

  
Fred A. Serafin  
Senior Vice President

Enclosure

cc: Mr. Michael Marr, 3577 Fruitvale Ave, Oakland, CA 94602

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**IMFC**

## Oakland RBCA Eligibility Checklist



The Oakland Tier 1 RBSLs and Tier 2 SSTLs are intended to address human health concerns at the majority of sites in Oakland where commonly-found contaminants are present. Complicated sites—especially those with continuing releases, ecological concerns or unusual subsurface conditions—will likely require a Tier 3 analysis. The following checklist is designed to assist you in determining your site's eligibility for the Oakland RBCA levels.

CRITERIA	YES	NO
1. Is there a continuing, <i>primary</i> source of a chemical of concern, such as a leaking container, tank or pipe? (This does <i>not</i> include residual sources.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Is there any mobile or potentially-mobile free product?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Are there more than five chemicals of concern at the site at a concentration greater than the lowest applicable Oakland RBCA level?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Are there any preferential vapor migration pathways—such as gravel channels or utility corridors—that are potential conduits for the migration, on-site or off-site, of a volatilized chemical of concern?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Do both of the following conditions exist? (a) Groundwater is at depths less than 300 cm (10 feet) (b) Inhalation of volatilized chemicals of concern from groundwater in indoor or outdoor air is a pathway of concern but groundwater ingestion is <i>not</i> *	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Are there any existing on-site or off-site structures intended for future use where exposure to indoor air vapors from either soil or groundwater is of concern <i>and</i> one of the following three conditions is present? (a) A slab-on-grade foundation that is less than 15 cm (6 inches) thick (b) An enclosed, below-grade space (e.g., a basement) that has floors or walls less than 15 cm (6 inches) thick (c) A crawl space that is not ventilated	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Are there any immediate, acute health risks to humans associated with contamination at the site, including explosive levels of a chemical?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8. Are there any complete exposure pathways to nearby ecological receptors, such as endangered species, wildlife refuge areas, wetlands, surface water bodies or other protected areas?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

\*If groundwater ingestion *is* a pathway of concern, the associated Oakland RBCA levels will be more stringent than those for any groundwater-related inhalation scenario, rendering depth to groundwater irrelevant in the risk analysis.

If you answer “no” to all questions, your site is eligible for the Oakland RBCA levels. If you answer “yes” to any of the questions, your site is *not* eligible for the Oakland RBCA levels at this time.



## Oakland RBCA Cover Sheet

**Project Proponent:** Grace Auto Repair  
**Site Address:** 2504 MacArthur Boulevard  
**Alameda County Parcel Number(s):** 29-992-19-1

Chemicals of Concern		
(1) Benzene	(4) Xylenes	(7)
(2) Ethylbenzene	(5) LUFT Metals	(8)
(3) Toluene	(6)	(9)

Exposure Pathways of Concern	
<i>Surficial Soil</i> <input type="checkbox"/> Ingestion/dermal contact/inhalation <i>Subsurface Soil</i> <input type="checkbox"/> Ingestion of groundwater impacted by leachate <input checked="" type="checkbox"/> Inhalation of indoor air vapors <input type="checkbox"/> Inhalation of outdoor air vapors	<i>Groundwater</i> <input checked="" type="checkbox"/> Ingestion of groundwater <input type="checkbox"/> Inhalation of indoor air vapors <input type="checkbox"/> Inhalation of outdoor air vapors <i>Water Used for Recreation</i> <input type="checkbox"/> Ingestion/dermal contact

Land Use Scenario	
<input type="checkbox"/> Residential	<input checked="" type="checkbox"/> Commercial/Industrial

Method of Analysis	
<input checked="" type="checkbox"/> Tier 1 <input type="checkbox"/> Tier 2 (specify soil type: <input type="checkbox"/> Merritt sands <input type="checkbox"/> sandy silts <input type="checkbox"/> clayey silts) <input type="checkbox"/> Tier 3 Model(s) employed: <input type="checkbox"/> Oakland RBCA <input type="checkbox"/> Other(s) (specify: )	

Application of RBCA Levels	
<input checked="" type="checkbox"/> As evidence that no further action required. Corrective Action Plan (CAP) is completed. <input type="checkbox"/> As target cleanup levels for removal or treatment of chemical(s) of concern <input type="checkbox"/> Other (specify: )	

Containment Measures	
<input checked="" type="checkbox"/> Cap (specify material: Asphalt, concrete.) <input type="checkbox"/> Vapor barrier (specify material:) <input type="checkbox"/> Other(s) (specify: ) <i>Exposure pathways that will be affected:</i> Subsurface soil: Inhalation of indoor air vapors	

Institutional Controls			
<input type="checkbox"/> Permit tracking	<input type="checkbox"/> Deed restriction	<input type="checkbox"/> Deed Notice	<input type="checkbox"/> Water well restriction
<input type="checkbox"/> Access control	<input checked="" type="checkbox"/> Other(s) (specify: <b>None</b> )		

Public Notification	
<i>Specify all actions to be taken:</i>	None

**Submitted by:** Michael Marr & Associates

**Date submitted:** May25, 2001