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CAMBRIA

October 6, 2004

Mr. Don Hwang
Alameda County Health Care Services Agency
Department of Environmental Health
UST Local Oversight Program
1131 Harbor Bay Parkway, 2nd Floor
Alameda, California 94502



Re: **Clarifications Regarding Closure Request**
Hooshi's Auto Service
1499 MacArthur Boulevard
Oakland, California 94602
Cambria Project No. 129-0741

Dear Mr. Hwang:

Cambria Environmental Technology, Inc. (Cambria) is transmitting this letter to the Alameda County Health Care Services Agency, Department of Environmental Health (ACHCSA-DEH) to clarify our position regarding a request for closure for the subject site (Figures 1 and 2) that was transmitted to ACHCSA-DEH on July 21, 2004 (Cambria, 2004). It is Cambria's position that the site has been adequately characterized, chemical concentrations have decreased significantly since remediation was implemented and the hydrogeologic materials through which groundwater flows is an impediment to substantial chemical migration. Therefore, at a minimum, the groundwater monitoring schedule should be reduced, and the site should be considered a candidate for closure. We will discuss points that support our position under sections entitled site characterization, decreasing chemical concentrations, hydrogeologic setting, groundwater monitoring schedule reduction and conclusions. The same points were discussed during a telephone conversation between Mr. Don Hwang of ACHCSA-DEH and Mr. Matt Meyers of Cambria on August 18, 2004.

## SITE CHARACTERIZATION

It is our understanding that the ACHSCA-DEH is of the opinion that additional characterization is warranted at the site. We are of the opinion that the site has been adequately characterized over the last 11 years and additional characterization is not warranted. The following discussion supports our position.

Since 1993, a total of 12 soil borings have been advanced and 6 monitoring wells have been installed. The maximum depth investigated has been 20 feet below ground surface (ft bgs).

**Cambria Environmental Technology, Inc.**

5900 Hollis Street
Suite A
Emeryville, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170

***1993 Site Assessment Activities:*** In 1993, three groundwater monitoring wells (MW-1, MW-2 and MW-3) were installed at the site. Soil and groundwater samples collected during the assessment activities indicated that the site was impacted by petroleum hydrocarbons that may have leaked from the former underground storage tanks (USTs).

***1996 Soil Borings:*** In June 1996, 12 soil borings were advanced to characterize the perimeter and center of the site (Figure 2). During soil boring advancement, 13 soil samples were collected at depths ranging from 5 to 14.5 ft bgs. Total petroleum hydrocarbons as gasoline (TPHg) was detected in 4 of the 13 samples collected and analyzed. TPHg [860 milligrams per kilogram (mg/kg)] was detected in only one of these samples, G-9-12.5, at a concentration at or in excess of its current environmental screening level (ESL) of 100 mg/kg for residential land use where groundwater is a current or potential source of drinking water [California Regional Water Quality Control Board – San Francisco Bay Region (RWQCB-SFBR), 2003]. This sample was collected in the area of the former underground storage tanks (USTs). Of the remaining 12 samples, only one contained TPHg at a concentration in excess of 1.5 mg/kg. TPHg was not detected in 10 of these samples.

Benzene was detected in three of the 13 samples collected and analyzed at concentrations at or in excess of its ESL of 0.044 mg/kg for residential land use where groundwater is a current or potential source of drinking water (RWQCB-SFBR, 2003). Benzene was detected in only one sample, GB-9-12.5, at a concentration at or in excess of its ESL for industrial/commercial land use where groundwater is <u>not</u> considered a current or potential drinking water source. The highest concentration detected was 3.1 mg/kg in G-9-12.5, the same sample in which the highest TPHg concentration was detected, near the former USTs.

With the exception of GB-3-14.5 and GB-9-11.5, none of the other soil samples collected contained TPHg and/or benzene at concentrations at or in excess of their ESLs for residential land use where groundwater is considered a current or potential drinking water source. In 9 of the remaining 10 samples, benzene was not detected at or in excess of its reporting limit.

***1996 Monitoring Well Installations:*** Soil samples were collected during the installation of monitoring wells MW-4, MW-5 and MW-6. TPHg was not detected in any sample collected and benzene was detected at a concentration of 0.049 mg/kg in only one sample (MW-5-15). MW-5 is located at the northern end of the former UST area.

While the benzene concentration detected is above the ESL for residential sites where groundwater is a current or potential source of drinking water, it is not above the commercial/industrial ESL where groundwater is not considered a current or potential drinking water source.

***Groundwater Monitoring Data***: A total of 174 groundwater samples have been collected during 31 monitoring events over the past 11 years. The groundwater data collected from these samples indicates that the plume is characterized by wells MW-1, MW-2 and MW-5. Wells MW-3, MW-4 and MW-6 and soil borings GB-4 and GB-7 characterize the upgradient, crossgradient and downgradient extents of the plume. TPHg and benzene have not been detected in MW-3 since February 2001; however, methyl tertiary-butyl ether (MTBE) has been detected at an average concentration of approximately 12 micrograms per liter (µg/L), which is below its primary maximum contaminant level (MCL) of 13 µg/L [Title 22, California Code of Regulations (CCR), Section 64444, Table 64444-A]. While TPHg and benzene have been detected in well MW-4 at maximum concentrations of 130 and 6.3 µg/L (October 2001), the average concentrations of these chemicals since February 2001 are calculated at 44 and 1.2 µg/L, respectively. In addition, during the last six monitoring events, TPHg and benzene have been detected only once, in October 2002. TPHg and/or benzene have not been detected in well MW-6, which monitors the southeastern lateral edge of the plume, since May 1999. GB-4 and GB-7, which are located crossgradient (northwestern) and upgradient (northeastern), did not contain detectable concentrations of TPHg and/or benzene when they were sampled in June 1996.

MTBE has not been detected consistently in the wells over the last few years of monitoring. Only in well MW-3 (the upgradient well) has MTBE been regularly detected over the past few years. It has not been detected in well MW-1 since October 2001. It has never been detected in wells MW-2 or MW-5. It has been detected in wells MW-4 and MW-6 only once (January 2003) since 1996 and the results appear to be anomalous and are most likely the result of cross-contamination.

## DECREASING CHEMICAL CONCENTRATIONS

Site remediation activities included the removal of three USTs from the site in October 1990 and installation and operation of a soil vapor extraction (SVE) and air sparging (AS) system. A confirmation soil sampling program followed removal of the USTs; however, no soil sampling data has been discovered to date to document the removal of impacted materials from the excavation. A total of 16.5 pounds of petroleum hydrocarbons was removed during operation of the SVE/AS system during its 8 months of operation (September 2000 through April 2001).

Prior to operation of the SVE/AS system, the average concentration of TPHg and benzene in MW-2, located in the center of the plume has decreased significantly. TPHg has decreased from an average concentration of approximately 160,000 µg/L between 1993 and 2000 to an average concentration of 18,000 µg/L between 2001 and 2004. Similarly, benzene has decreased from an average concentration of 11,000 µg/L between 1993 and 2000 to an average concentration of approximately 274 between 2001 and 2004. Thus, in the source area well the concentration of TPHg has decreased one order of magnitude and the concentration of benzene has decreased two orders of magnitude since the SVE/AS system operations were implemented.

In MW-1, located on the northwestern edge of the source area plume, the average concentrations of TPHg and benzene prior to the operation of the SVE/AS system (1993 to 2000) were approximately 1,353 µg/L and 106 µg/L, respectively. Between 2001 and 2004, the concentrations of TPH and benzene have decreased to approximately 58 µg/L and 0.4 µg/L, respectively. Both of these concentrations are below the ESLs for residential sites where groundwater is considered a current or potential drinking water source (RWQCB-SFBR, 2003). In addition, the average concentration of benzene is below its MCL (1 µg/L) (Title 22, CCR, Section 64444, Table 64444-A).

## CHEMICAL MIGRATION AND THE HYDROGEOLOGIC SETTING

Groundwater flowed to the southwest during the most recent groundwater monitoring event, July 2004 (Cambria, 2004b). This is the direction that groundwater has flowed since monitoring began in 1993.

Since February 2001, the average concentrations of TPHg and benzene concentrations in MW-4, the well that monitors the leading (southwest) edge of the plume, are 44 and 1.2 µg/L, respectively. In addition, during the last six monitoring events, TPHg and benzene have been detected only once, in October 2002, and MTBE has been detected only once (January 2003 at 20 µg/L). The last time MW-4 was sampled (October 2003), none of these chemicals were detected.

The predominant soil materials encountered were clayey sands and sandy clays, which have been observed to a total explored depth of 20 ft bgs. The hydraulic conductivity of these materials has been calculated to be on the order of 1 to 2.6 x $10^{-5}$ centimeters per second (cm/s) [Century West Engineering Corporation (CWEC), 1996]. These clayey sand materials appear to have the thickness (12 ft) and hydraulic conductivity that would act as a barrier to vertical and horizontal fluid movement.

Empirical data indicates that groundwater flow and chemical migration is restricted due to the low hydraulic conductivity of the hydrogeologic materials. Thus, the plume is confined to the site and does not appear to be migrating offsite.

## GROUNDWATER MONITORING PROGRAM REDUCTION

Thirty-one groundwater monitoring events have been conducted over the past 11 years. A total of 174 groundwater samples have been collected and analyzed during that period. The volume of data produced during this period is reasonable to assess trends in type, magnitude and direction of groundwater flow and chemical transport. Because these parameters have been discerned, it is justified to place the groundwater monitoring program on a reduced sampling schedule.

## CONCLUSIONS

Based on the data and interpretations presented above, Cambria makes the following conclusions:

- Additional site characterization is not warranted. Soil contamination is confined to the immediate vicinity of the former USTs. No other soil samples contained TPHg or benzene at concentrations at or above their ESLs based on residential site use with groundwater being a current or potential source of drinking water.

- The soil samples that contained the highest concentrations of TPHg and benzene were collected from materials that were below the top of the water table and were saturated. The issue being that these materials are more representative of groundwater conditions and not soil conditions.

- Groundwater impacts are confined to the site. The low hydraulic conductivity of the soil materials through which groundwater flows and chemicals migrate is low enough to inhibit substantial migration of contaminants through the subsurface environment. Empirical data indicates that chemicals are not migrating offsite and that the primary impact to groundwater occurs in the immediate vicinity of the former USTs.

- Site remediation activities have resulted in significant decreases in chemical impacts to groundwater. TPHg and benzene concentrations have decreased by up to two orders of magnitude in the vicinity of the former USTs following operation of the SVE/AS system.

- MTBE does not appear to be a significant impact to groundwater quality at the site. While it has been detected in the upgradient well (MW-3) over the last few years, it does not appear to be a chemical that has originated onsite or should be considered a chemical of concern at the site.

- The groundwater monitoring schedule should be reduced because adequate data has been collected to assess chemical parameters and trends at the site. A semi-annual or annual monitoring schedule is more appropriate for a site at which groundwater impacts are confined to the site and chemical impacts are decreasing.

- The site should be considered a candidate for closure. TPHg and benzene concentrations are decreasing significantly, chemicals are confined to the site and the chemicals benzene and MTBE do not appear to impose a significant threat to human health and the environment.

## CLOSING

Thank you for your considering this closure request. If you have any questions or comments regarding this site, please call Matthew Meyers at (510) 420-3314.

Sincerely,
**Cambria Environmental Technology, Inc.**

Matthew A. Meyers
Senior Staff Geologist

Neal Siler, R.G., R.E.A.
Senior Project Geologist

cc: Ms. Naomi Gatzke, 1545 Scenic View Drive, San Leandro, California 94577

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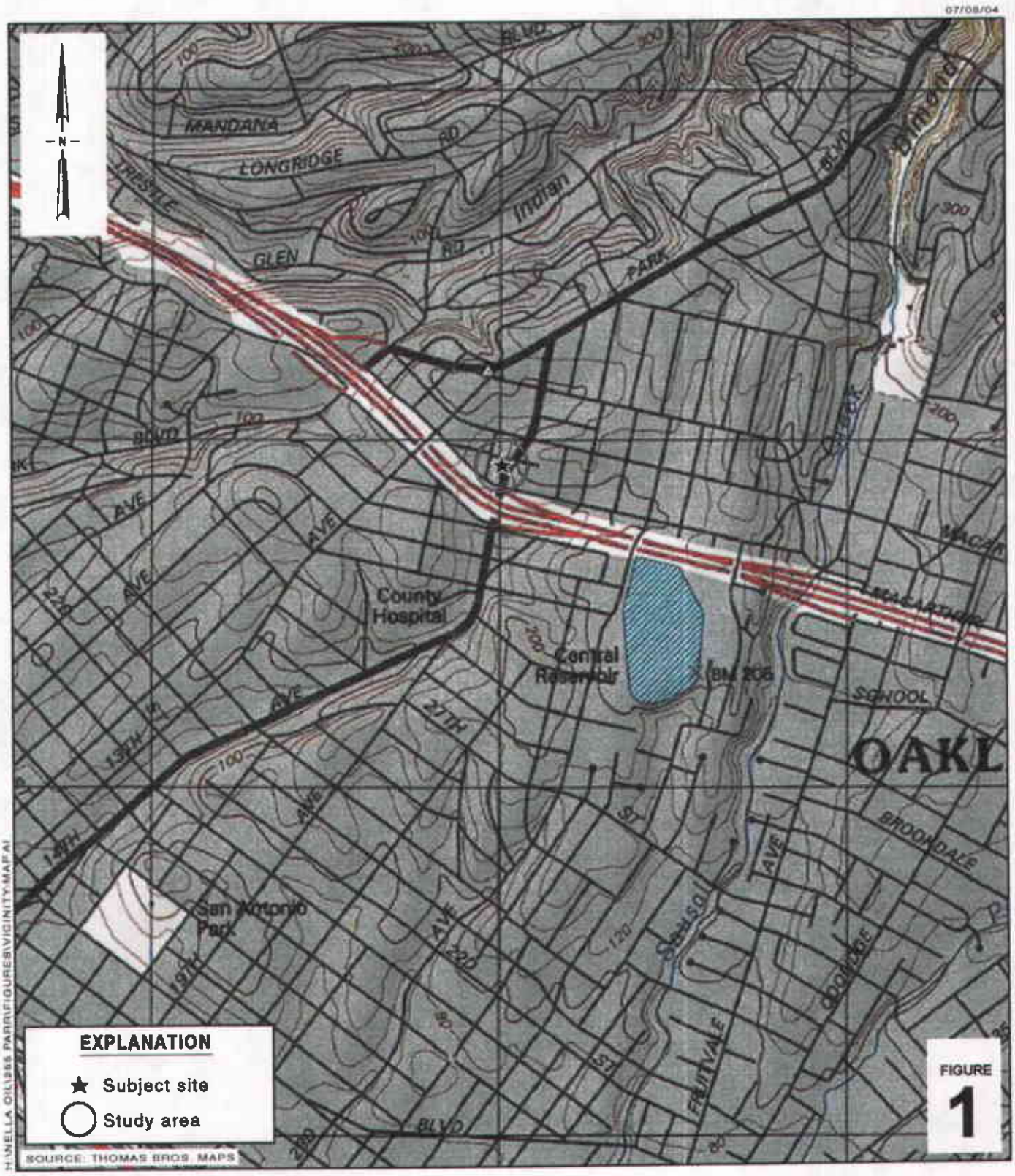
## REFERENCES

California Code of Regulations, Title 22, Section 64444, Table 64444-A

California Regional Water Quality Control Board – San Francisco Bay Region, 2003, *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater: Volumes 1 and 2 (Interim Final).* July

Century West Engineering Corporation, 1996, *Report of Phase II Site Characterization.* August 3.




**Hooshii's Auto Service**

1499 MacArthur Boulevard

Oakland, California

CAMBRIA

**Vicinity Map**

250 Foot Radius

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1499 MacAurthur Boulevard
Oakland, California

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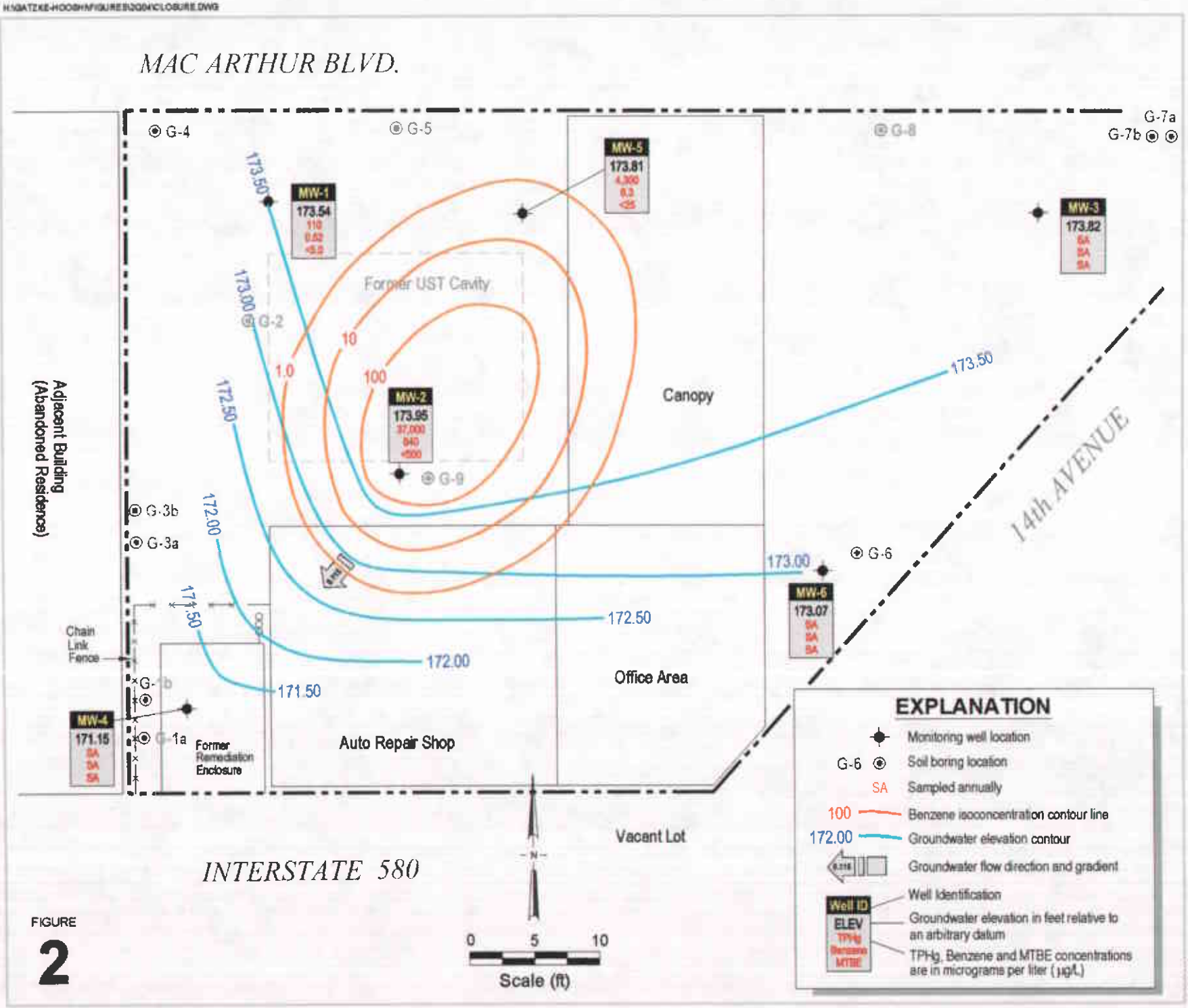
## Groundwater Elevation Contour and Hydrocarbon Concentration Map

April 2, 2004




FIGURE

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