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28 March 1996
A953399

Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway
Alameda, California 94502-6577

Attention: Ms. Susan L. Hugo, Senior Hazardous Materials Specialist

SUBJECT: WELL SURVEY, INVESTIGATION SUMMARY AND REQUEST FOR CASE CLOSURE, WATSON TRUST PROPERTY, 1461 PARK AVENUE, EMERYVILLE, CALIFORNIA

Dear Ms. Hugo:

Applied Geosciences Inc. is pleased to submit this letter, at the request and on behalf of Union Bank (acting as trustee), to present well information, summarize the investigations conducted to date, and to request case closure for the Watson Trust property located at 1461 Park Avenue, Emeryville, California (site; Figure 1). The information in this letter report is presented to demonstrate that the site would be considered a low risk groundwater case as described in the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB) memorandum dated 5 January 1996. This memorandum was prepared in response to the Lawrence Livermore National Laboratory (LLNL) report regarding petroleum releases from underground storage tanks. The well survey was intended to assess the location of groundwater production well(s) in the site vicinity. The information was requested from the local water district or city engineering department.

This letter report summarizes the characterization work conducted to date at the site. This has included the removal of the underground storage tanks, the installation of soil borings and groundwater monitoring wells, the collection and analysis of soil and groundwater samples, an assessment of subsurface conditions and of off-site sources of hazardous materials detected in the groundwater samples collected at the site, and quarterly groundwater monitoring events. While the corrective action plan (CAP) prepared for the site proposed 2 years of quarterly groundwater monitoring, in light of recent regulatory action, we are requesting that a review of the site status be conducted following a full year of monitoring.

SITE SETTING

The site is located in an area predominantly occupied by light and heavy industry within the City of Emeryville, California. Ground surface elevation at the site is approximately 10 feet above mean sea level (USGS, 1959). The site is occupied by one, 1-story concrete building which occupies the entire site with the exception of a narrow strip of asphalt along the eastern portion of the site which is used for parking and access to loading bays. The site is reportedly occupied by Western Brake Company which warehouses and distributes vehicle brake parts and radiators. No manufacturing is reportedly conducted at the site.

GEOLOGY, HYDROGEOLOGY, and GROUNDWATER

The site is located approximately 0.5-mile east of the eastern shore of the San Francisco Bay in the City of Emeryville. The site is mapped by Helley et. al. (1979) as being underlain by fine-grained alluvium. These materials have been described as unconsolidated, plastic, moderately to poorly sorted silt and clay rich in organic material. These materials are reported to interfinger with salt-water marsh deposits (Bay Mud) near the margins of the San Francisco Bay. The logs of borings advanced at the site and for the site vicinity confirm that fine grained materials, predominantly clay and silty clay, are present from near the ground surface to at least 20-feet BGS with local lenses of silty sand at 7- to 10-feet below the ground surface (BGS). Based on the locations of the borings advanced at the site and in the site vicinity, these fine-grained subsurface materials are expected to be laterally continuous. Additionally, the fine-grained nature of the subsurface materials likely result in very low liquid and/or vapor permeabilities, restricting the horizontal and vertical flow of fluids and/or vapors.

Based on depth to groundwater gauging conducted during the quarterly monitoring, the static groundwater depth at the site has consistently been between 3.8 and 4.9 feet BGS over the past year. The shallow groundwater gradient has been calculated at 0.008 feet per foot (ft./ft.), and has been consistent over the year with a consistent interpreted flow direction of approximately northwesterly.

According to personnel at the County of Alameda Public Works Agency, the City of Emeryville does not utilize groundwater for their water supply. Water supply for the City of Emeryville is provided by East Bay Municipal Utility District (EBMUD). Based on conversations with personnel of EBMUD, EBMUD uses water from the Mokelumne River watershed, which is stored in the Pardee Reservoir located in Amador and Calaveras Counties. Water is brought to the East Bay via canals and pipelines for treatment prior to distribution. EBMUD does not utilize groundwater to supplement their water supply. Based on information in the Water Quality Control Plan for the San Francisco Bay Basin, Region 2 (RWQCB, 1986), beneficial uses of groundwater beneath the site are listed as municipal and domestic supply, agricultural supply, industrial process water supply, and industrial service supply. However, it is the experience of Applied Geosciences Inc. that the shallow groundwater near the San Francisco Bay is generally of poor quality, being high in total dissolved solids (TDS), and generally of low sustainable yields. Therefore, it is the judgement of Applied Geosciences Inc. that there is a

very low likelihood that the shallow groundwater beneath the site is, or would be, utilized for its designated beneficial uses.

To further assess the likelihood that groundwater in the site vicinity is being used and/or will be used for its designated beneficial uses, personnel from Applied Geosciences Inc. requested a Well Inventory Report from the County of Alameda Public Works Agency (APW). Based on the Well Inventory Report, two wells in the site vicinity were historically used for the designated beneficial uses of the groundwater. One of the wells, designated number 1 on Figure 1, may be located 1,000 to 1,500 feet west southwest of the site in the general cross-gradient groundwater flow direction. Based on the APW database, the drill date for this well is unknown, it is reported to be 497 feet deep, and to be used for irrigation purposes. In an effort to verify the location of the well, Mr. Andreas Godfrey of the APW was contacted. Mr. Godfrey stated that the file for the well was not present at the APW indicating that the well location is suspect. Mr. Godfrey stated that many of the old production wells were discovered in the 1960s when salt water intrusion became a problem due to over pumping of the deeper aquifers. It is likely, in his opinion, that this well represents an old irrigation well that is no longer in use. The second well, designated number 2 of Figure 1, is located approximately 0.5-mile east southeast of the site in the general upgradient groundwater flow direction. Based on the APW database, the drill date for this well is approximately 1936, it is reported to be 97 feet deep, and to be used for industrial purposes. As with the other production well located in the site vicinity, it is unclear weather the well is still in use today. According to Mr. Godfrey, it is unlikely that the wells are in use today based on the cost to maintain pumping and pressure systems. Mr. Godfrey stated that a restaurant located in Berkeley, California recently installed a well to provide drinking water. After 1 year of operation, the pumping from the well was discontinued due to the extremely high cost as compared to water supplied from the EBMUD.

Based on the likely high total dissolved solids, low sustainable yield, and information provided by County of Alameda Public Works, no groundwater wells in the site vicinity are utilized for drinking water purposes. Also, based on the fact the entire site vicinity utilizes water supplied by EBMUD, and the fact that the underlying shallow groundwater in the site vicinity has been degraded with pollutant levels above Maximum Contaminant Levels for drinking water from the Electro Coating Inc. facility (as discussed below), and the additional information presented above, it is the judgement of Applied Geosciences Inc. that it is extremely unlikely that water wells would be installed in the site vicinity for drinking water purposes anytime in the foreseeable future.

PREVIOUS INVESTIGATION INFORMATION

The previous investigation information presented herein was obtained from the report titled "Corrective Action Plan (CAP) for the Watson Trust Property, 1461 Park Avenue, Emeryville, California" prepared by Blakely Environmental Inc. dated 10 March 1995.

In March 1990, two underground storage tanks (UST), that were reportedly installed in 1980, were removed from the site. A 3,000-gallon gasoline UST was reported to be found in good

condition. A 500-gallon UST, thought to contain either diesel or gasoline, was reported to have showed evidence of leakage. The tanks were excavated, and soil samples and groundwater samples were collected. The soil was reported to contain elevated concentrations of total petroleum hydrocarbons (TPH) as gasoline (TPHg) and benzene, toluene, ethylbenzene and xylenes (BTEX), but not TPH as diesel (TPHd). The highest concentration of TPHg was reported in the soil sample collected from the south wall of the 500-gallon tank excavation at a concentration of 1,580 milligrams per kilogram (mg/kg). The groundwater was also reported to contain elevated concentrations of TPHg and BTEX, but not TPHd.

In September 1990, three groundwater monitoring wells were installed at the site. Monitoring well MW1 was installed immediately adjacent to the location of the former USTs; MW2 was installed approximately 30 feet in the interpreted upgradient groundwater flow direction from the location of the former USTs; and MW3 was installed in the interpreted general cross- to down-gradient groundwater flow direction from the USTs. The location of the wells are presented in Figure 2 of this report. During the installation of the monitoring wells, soil samples collected from 5 and 10 feet BGS were submitted for laboratory analysis for TPHg and BTEX. The highest concentration of TPHg and BTEX was reported in the soil sample collected from 5 feet BGS in monitoring well MW1 located immediately adjacent to the former USTs. The other soil samples collected at depths of 5 and 10 feet BGS in MW2 and MW3, and analyzed, did not contain TPHg, toluene, ethylbenzene, or xylenes in concentrations greater than the reporting limit. Very low concentrations of benzene were reported in the other soil samples analyzed from the well installation. Initial groundwater samples were collected at the end of September 1990. The results of the initial groundwater sampling are presented in Table 1 of this letter report.

To assess the extent of petroleum impacted soil at the site and in the immediate off-site areas, Remedial Action Corporation (RAC) advanced 30 shallow soil borings within an area of approximately 50 feet of the former USTs. The borings were advanced between May and October 1991. TPHg was reported in soil samples at concentrations ranging from less than 1 to 3,400 mg/kg. BTEX constituents were reported in the soil samples in concentrations ranging from less than 0.0025 to 13, 80, 53, and 260 mg/kg, respectively. The highest concentrations of TPHg and BTEX were reported in soil samples collected from borings located approximately 25 feet west of the former USTs. Based on the information summarized in the CAP, the extent of petroleum hydrocarbon impacted soil is isolated to an approximate 1,500 square foot area located immediately west and north of the former USTs. The area of impacted soil is covered by the concrete warehouse structure located at the site and by the surface covering associated with Park Avenue. Additionally, based on the analysis of soil samples collected from both 2 and 6 feet BGS in the above referenced borings, the impacted soil may be limited to a 1 to 2 foot thick layer at the soil/groundwater interface approximately 6 feet BGS.

Groundwater in the three wells was sampled by RAC in May 1991 and again by Blakely Environmental Inc. in May 1995 and July 1995. Groundwater was sampled in November 1995 and January 1996 by personnel from Applied Geosciences Inc. These latter sampling rounds represent the third and fourth consecutive sampling events at the site. The results of the

groundwater sample analysis are summarized in Table 1 of this report. Relatively low concentrations, to non-detect levels, of petroleum hydrocarbons and/or associated constituents were reported in the groundwater samples collected from the three monitoring wells during the most recent groundwater sampling event. The highest concentrations of petroleum hydrocarbons were reported in the sample collected from monitoring well MW1, located immediately adjacent to the former location of the UST. Low concentrations of benzene and toluene were reported in MW-2, and only benzene was reported in MW-3. The concentrations of petroleum hydrocarbons and/or associated constituents have decreased, or have been relatively stable, over the monitoring period.

Oxygen in the groundwater is necessary for aerobic microbial activity to occur. The natural microbial activity occurring in the subsurface results in a natural attenuation of the petroleum hydrocarbons present in the groundwater. During the groundwater sampling events, dissolved oxygen concentrations in groundwater were measured to assess the likelihood that sufficient oxygen was present in the groundwater to allow natural biodegradation of the residual concentrations of petroleum hydrocarbons present in the groundwater. The dissolved oxygen concentrations in groundwater are presented in Table 1. The concentrations of dissolved oxygen in the groundwater has varied from 2.46% to 6.1%, with the highest concentrations being present in the samples collected from MW3. Likewise, the highest TPH concentrations and the lowest dissolved oxygen concentrations were reported in MW1. This would be expected because the concentrations of petroleum hydrocarbons are the least in MW3 and therefore the microbial activity and use of oxygen should also be the least in MW3. This distribution of dissolved oxygen concentrations in groundwater suggests that sufficient oxygen is present in the subsurface to allow natural microbial activity to effectively limit the migration of residual petroleum hydrocarbons in the subsurface.

As presented in the CAP, halogenated hydrocarbons (primarily trichloroethene [TCE]) and metals (primarily chromium) were reported in groundwater samples collected upgradient and downgradient of the Watson Trust site. It has been documented that these constituents originated from illegal disposal practices which occurred at the Electro Coating, Inc. (ECI) facility located immediately upgradient from the site. These constituents have migrated with the groundwater and have degraded the groundwater beneath the Watson Trust property. The concentrations of TCE at the Watson Trust site as a result of migration in groundwater from the ECI facility range from up to 11,000 micrograms per liter (μg/l) near the upgradient property boundary to 400 μg/l off-site and downgradient. The concentrations of total chromium at the Watson Trust site as a result of migration in groundwater from the ECI facility range from up to 160,000 micrograms per liter (μg/l) near the upgradient property boundary to 35,000 μg/l off-site and downgradient. The values for TCE above are from 2,200 to 80 times greater than the Maximum Contaminant Level (MCL) for drinking water. Moreover, the values for total chromium above are from 3,200 to 700 times greater than the MCL for drinking water. The plume associated with these releases from the ECI facility fully encompasses the relatively minor release of petroleum hydrocarbons at the Watson Trust site.

LOW RISK GROUNDWATER CASE DESIGNATION FOR THE WATSON TRUST SITE

As presented in the 5 January 1996 RWQCB Memorandum in regards to petroleum hydrocarbon leak sites, low risk groundwater cases are those which demonstrate the following criteria:

1. The leak has been stopped and ongoing sources, including free product, have been removed or remediated.

2. The site has been adequately characterized.

3. The dissolved hydrocarbon plume is not migrating.

4. No water wells, deeper drinking water aquifers, surface water, or other sensitive receptors are likely to be impacted.

5. The site presents no significant risk to human health.

6. The site presents no significant risk to the environment.

In the case of criteria 1 above, the USTs were removed from the site in March 1990. Dissolved petroleum hydrocarbons were reported in the groundwater samples collected from the UST excavations and residual concentrations of petroleum hydrocarbons were reported in the soil samples collected from the walls of the excavation. No free product was reportedly observed on the standing water in the excavation. Based on this information, and the information presented previously in this letter and in the CAP, it is judged that criteria 1 referenced above has been met.

In the case of criteria 2 above, 30 shallow soil borings and 3 groundwater monitoring wells were installed to characterize the extent of petroleum hydrocarbons in soil and groundwater. Based on the analytical results from soil samples collected, the extent of petroleum hydrocarbon impacted soil is restricted to an approximate 1,500 square foot area located immediately west and north of the former USTs. The area of impacted soil is covered by the concrete warehouse structure located at the site and by surface covering associated with Park Avenue. Also, the impacted soil may be limited to a 1 to 2 foot thick layer at the soil/groundwater interface approximately 6 feet BGS and is likely the result of the historical presence of dissolved constituents in groundwater. The extent of petroleum hydrocarbons in groundwater currently appears to be limited to the area immediately around the former USTs. This is based on the fact that the greatest concentrations of petroleum hydrocarbons are reported in groundwater samples collected from MW1, located immediately adjacent to the former USTs, with non-detect to very low concentrations reported in monitoring wells MW2 and MW3, located in the general up-gradient and cross- to down-gradient groundwater flow directions, respectively. Based on this information and that presented in the CAP, it is judged that criteria 2, referenced above, has been met.

In the case of criteria 3 above, the LLNL report found that petroleum plumes tend to stabilize once the source is removed, as the leading edge of the plume is biodegraded at such a rate that additional migration does not occur. The main reason for the stability is because natural biodegradation of the hydrocarbons occurs. One way to assess whether biodegradation is occurring at a site is to measure dissolved oxygen concentrations, which is necessary for natural microbial activity. Dissolved oxygen concentrations in groundwater were measured in each well during the last three groundwater monitoring events. During each of the quarterly sampling rounds, dissolved oxygen concentrations were least in monitoring well MW1, which has the highest petroleum hydrocarbon concentrations, and greater in both MW2 and MW3, both of which show non-detect to very low concentrations of petroleum hydrocarbons. Additionally, the concentrations of petroleum hydrocarbons reported in the groundwater samples collected from the monitoring wells have been stable, or for the most part have decreased, during the period of monitoring. Slight variations have been observed, however, these are likely attributable to changes in groundwater flow, degradation rates, or other factors that are also naturally variable. It should also be noted that the fine-grained nature of the subsurface materials at the site likely result in very low liquid and/or vapor permeabilities, restricting the horizontal and vertical flow of fluids and/or vapors. Based on this information, natural biodegradation has likely stabilized the groundwater plume, and the fine-grained nature of the subsurface material will likely further limit the horizontal and/or vertical movement. Therefore, it is judged that criteria 3 referenced above has likely been met.

As presented in the Geology, Hydrogeology, and Groundwater section above, it is possible that two water wells are present within the site vicinity. Based on discussions with personnel from APW, it is not clear whether these wells are still active, and in one case, the actual location is suspect. One of the wells is located 0.5-mile upgradient from the site and the other well, which has a suspect location, is located at least 1,000 feet crossgradient from the site. Based on the likely stability of the plume as discussed above, it is extremely unlikely that the above mentioned water wells, if present, would be affected by the hydrocarbon plume at the site. Due to the thickness of, and the low vertical permeability of the fine-grained subsurface materials, which will impede the vertical movement of groundwater, it is considered to be extremely unlikely that deeper drinking water aquifers will be affected by the hydrocarbon plume at the site. Additionally, other than the San Francisco Bay, located 0.5-mile west of the site, no surface water bodies or other sensitive receptors are located proximate to the site. Based on the likely stability of the plume, it is extremely unlikely that the San Francisco Bay would be affected by the petroleum hydrocarbon plume at the site. Based on this information, it is therefore judged that criteria 4 referenced above has been met.

As presented in the RWQCB 5 January 1996 Memorandum, the American Society of Testing and Materials (ASTM) standard for Risked Based Corrective Action (RCBA), ASTM E-1739-95, was consulted to assess the likelihood that the site presents a significant risk to human health. This guideline presents a tiered approach, based on the protection of human health and the environment, to corrective action at petroleum release sites. Basic site assessment data, which has been gathered for the Watson Trust site and is summarized in this report and in the CAP, is needed to evaluate the site utilizing the ASTM E-1739-95 guideline. Once a site is

characterized, petroleum hydrocarbon concentrations reported in soil and groundwater samples are compared with Tier 1 Risk Based Screening Levels (RBSLs) given in a look-up table. If chemical concentrations exceed Tier 1 RBSLs, then further tier evaluation is conducted using more site-specific data. For many sites, the look-up table presented in the guidelines, which is considered to be conservative, is adequate for the Tier 1 evaluation. The look-up table presented in the ASTM E-1739-95 guideline has been used for this evaluation. As required in the RWQCB 5 January 1996 Memorandum, the benzene RBSL concentrations presented in the ASTM guideline look-up table must be multiplied by 0.29 to account for the higher California toxicity value for benzene. The RBSLs for compounds that have been classified as carcinogens are presented as cancer risks of 10^{-4} to 10^{-6}, whereas for compounds that have not been classified as carcinogens, the RBSLs are presented as hazard quotients of unity.

Because the shallow groundwater at the site is currently not used for drinking water purposes and it is extremely unlikely that it will be used for drinking water in the future, the groundwater ingestion pathway presented in ASTM E-1739-95 is not considered. Additionally, because groundwater is present at approximately 4- to 5-feet BGS and the highest concentrations of petroleum hydrocarbons in soil are likely limited to a narrow band at approximately 6-feet BGS, and the entire site is capped with a building or asphalt for roadways, the exposure pathway from volatilization from soil is not considered. The two scenarios considered are vapor intrusion from groundwater to buildings, and groundwater volatilization to outdoor air.

Because benzene is one of the compounds present in groundwater, an assessment of whether the acceptable cancer risk is 10^{-4} or 10^{-6} was conducted. Based on information presented in the ASTM guidelines, Federal and State regulatory agencies have adopted a 10^{-6} cancer risk as being negligible in situations where there is potential exposure of compounds to very large populations (ie, 200 million people). Where smaller populations are exposed (for example, in occupational settings), theoretical cancer risks of up to 10^{-4} have been considered acceptable. Personnel from Applied Geosciences Inc. contacted Dr. Ravi Arulanantham, toxicologist for the RWQCB, to discuss acceptable risks for the site. Dr. Arulanantham suggested that because the site is used for industrial purposes and the site vicinity is used for similar purposes, and because the compound of concern is benzene (a Group A carcinogen), a cancer risk of 10^{-5} should be considered acceptable. Dr. Arulanantham also stated that due to the attenuation of benzene at this site, an area weighted average of the benzene concentrations in groundwater would be considered an acceptable evaluation of the average concentration of benzene in groundwater. The highest concentrations of BTEX are present in the immediate vicinity of the former USTs, and the concentrations attenuate rapidly in the downgradient groundwater flow direction. Figure 2 presents the interpreted contours for benzene based on the most recent groundwater sampling event.

Based on the look-up table for groundwater volatilization to outdoor air for industrial/commercial facilities, the benzene RBSL for a cancer risk of 10^{-5} using the 0.29 correction factor is 0.5336 milligrams per liter (mg/l). The highest concentration of benzene reported in the monitoring wells is 0.33 mg/l, which is significantly lower than this Tier 1 concentration. Additionally, toluene, ethylbenzene and xylenes are all at low concentrations and below the chronic hazard quotient for the specific compounds.

Based on the look-up table for groundwater volatilization to buildings for industrial/commercial facilities, the toluene, ethylbenzene and xylenes concentrations are low, and are below the RBSL concentrations for the chronic hazard quotients for the specific compounds. The benzene RBSL for a cancer risk of 10^{-5} using the 0.29 correction factor is 0.214 mg/l. This value has been estimated on Figure 2 and is presented as a dark contoured line. Based on the RBSL and the estimated distribution of benzene in groundwater, the RBSL for benzene may be exceeded in the extreme northeast corner of the on-site building. However, the concentrations of benzene vary over the site (including beneath the building). The majority of the site is underlain by groundwater with very low concentrations of benzene which are well below the RBSL for a cancer risk of 10^{-5}. Therefore, as suggested by Dr. Arulanantham of the RWQCB, an evaluation of the area weighted average of the benzene concentrations in groundwater was conducted for the site. A weighted average is an average calculated to take into account the importance of each value to the overall total. For example, it is an average in which each observation value is weighted by some index of its importance. Because the benzene concentration in groundwater varies over the site, with the majority of the site underlain by groundwater with very low concentrations, the average concentration of benzene for the site is weighted by the area which is impacted by a specific concentration. This was accomplished by dividing the area underlain by groundwater affected by benzene into equal cells. Each cell was assigned a benzene concentration using a computer program which uses a kriging algorithm. To determine the area weighted average concentration, the calculated benzene concentrations values of each cell were multiplied by the area of the cell. These resultant values were then totaled and the total was divided by the total area to establish the average concentration of benzene for the area affected. Table 2 presents the x and y coordinates for the cells used, and the values of benzene assigned to each cell. This distribution of concentrations was used to estimate the benzene concentration contours presented in Figure 2. The calculated area weighted average concentration of benzene in groundwater at the site is 0.047 mg/l, which is well below the benzene RBSL of 0.214 mg/l for a cancer risk of 10^{-5} using the 0.29 correction factor.

It should also be noted that as stated in the guideline, the risk values do not reflect the probability for the specific exposure scenario to occur. Therefore, the actual potential risk to a population for the RBSLs is lower than given risk value (i.e. 10^{-5}). Based on this evaluation, it is judged that the site would unlikely be considered to represent a significant risk to human health, and criteria 5, referenced above, likely has been met.

As presented in the rationale for criteria 4 above, it is judged that it is extremely unlikely that the San Francisco Bay or any other sensitive receptors would be affected by the petroleum hydrocarbon plume at the site. Therefore, it is judged that the site does not represent a significant risk to the environment, and therefore, criteria 6 referenced above has been met.

Based on the information presented in this report, it is judged that the Watson Trust site should be considered a low risk groundwater case as described in the 5 January 1996 RWQCB Memorandum. Additionally, groundwater quality has been monitored quarterly at the site for a period of one year in addition to sampling conducted in 1990 and 1991, and the hydrocarbon plume at the site is judged to be stable. Additionally, it is judged that the residual, low concentrations of petroleum hydrocarbons will eventually be effectively reduced by natural biodegradation processes. Therefore, it is requested that the site be considered for case closure by the Alameda County Health Care Services Agency, Department of Environmental Health.

On behalf of Union Bank (acting as trustee), we appreciate your prompt review of this submittal. We will be in contact within 2 weeks to schedule a meeting to discuss the status of the site. If you have any questions regarding the information presented in this letter, please feel free to contact either of the undersigned at your convenience, or Ms. Susan E. McCormack at Union Bank directly at 818-810-6594.

Very truly yours,
APPLIED GEOSCIENCES INC.

ALEX J. GALLEGO, RG 6349
Project Manager

WILLIAM G. THEYSKENS, CHG
Senior Project Manager

cc: Dr. Ravi Arulanantham, Regional Water Quality Control Board
Ms. Susan E. McCormack, Union Bank

TABLE 1
1461 PARK AVENUE, EMERYVILLE, CALIFORNIA
GROUNDWATER ANALYTICAL RESULTS

WELL NUMBER	DATE	TPHg	BENZENE	TOLUENE	ETHYL-BENZENE	TOTAL XYLENES	DISSOLVED OXYGEN
MW1	26-Sep-90	-50	1.9	1.1	-0.3	3.3	--
	May-91	3418	1454	273	9.4	599	--
	05-May-95	600	540	28	8	180	--
	05-Jul-95	4400	700	14	5	130	2.98
	03-Nov-95	300	150	2	1	19	2.46*
	04-Jan-96	900	330	82	13	68	2.76
MW2	26-Sep-90	1200	209	33.7	5.4	128	--
	May-91	110	11.2	1.2	-0.5	1	--
	05-May-95	-500	-0.6	-1	-1	-3	--
	05-Jul-95	1600	-0.6	26	-1	-3	3.2
	03-Nov-95	-50	5	0.6	-0.5	-2	3.76*
	04-Jan-96	-50	1	0.6	-0.5	-2	2.9
MW3	26-Sep-90	-50	5.1	-0.3	-0.3	-0.6	--
	May-91	-10	-2.7	-0.5	-0.5	-0.5	--
	05-May-95	-500	7.4	-1	-1	-3	--
	05-Jul-95	-500	5.6	-1	-1	-3	6.1
	03-Nov-95	-50	7.6	-0.5	-0.5	-2	2.9*
	04-Jan-96	-50	9	-0.5	-0.5	-2	3.9

Notes:

Results are reported in micrograms per liter, except for dissolved oxygen which is reported in the average parts per million.

TPHg = Total Petroleum Hydrocarbons as gasoline analyzed by modified EPA Method 8015 following sample purge and trap by EPA Method 5030.

Benzene, Toluene, Ethylbenzene, and Xylenes analyzed by modified EPA Method 8020 following sample purge and trap by EPA Method 5030.

Negative values (-) represent reporting limits above which concentrations were not reported.

(--) = Analysis not performed.

Results for 5 May 1995 and 5 July 1995 obtained from Blakely Environmental Inc., dated 21 July 1995.

* = Dissolved Oxygen readings taken on 21 November 1995 for the samples collected on 3 November 1995.

Table 2

Benzene Concentration Weighted Average Calculations

Coordinate of Nodes				
Easting	Northings	Benzene	Area of Node	Resultant
305.00	867.00	0.006	94	0.604
315.39	867.00	0.007	94	0.645
325.78	867.00	0.007	94	0.697
336.17	867.00	0.008	94	0.760
346.56	867.00	0.009	94	0.835
356.94	867.00	0.010	94	0.920
367.33	867.00	0.011	94	1.014
377.72	867.00	0.012	94	1.115
388.11	867.00	0.013	94	1.220
398.50	867.00	0.014	94	1.325
408.89	867.00	0.015	94	1.421
419.28	867.00	0.016	94	1.496
429.67	867.00	0.016	94	1.530
440.06	867.00	0.016	94	1.494
450.44	867.00	0.014	94	1.349
460.83	867.00	0.011	94	1.066
471.22	867.00	0.007	94	0.670
481.61	867.00	0.003	94	0.301
492.00	867.00	0.001	94	0.094
305.00	878.75	0.007	94	0.669
315.39	878.75	0.008	94	0.723
325.78	878.75	0.008	94	0.796
336.17	878.75	0.009	94	0.888
346.56	878.75	0.011	94	0.999
356.94	878.75	0.012	94	1.129
367.33	878.75	0.014	94	1.280
377.72	878.75	0.015	94	1.453
388.11	878.75	0.018	94	1.649
398.50	878.75	0.020	94	1.870
408.89	878.75	0.022	94	2.114
419.28	878.75	0.025	94	2.379
429.67	878.75	0.028	94	2.656
440.06	878.75	0.031	94	2.921
450.44	878.75	0.033	94	3.118
460.83	878.75	0.033	94	3.112
471.22	878.75	0.028	94	2.620
481.61	878.75	0.016	94	1.538
492.00	878.75	0.008	94	0.744
305.00	890.50	0.008	94	0.732
315.39	890.50	0.009	94	0.804
325.78	890.50	0.010	94	0.905
336.17	890.50	0.011	94	1.034
346.56	890.50	0.013	94	1.191
356.94	890.50	0.015	94	1.379

Table 2
Benzene Concentration Weighted Average Calculations

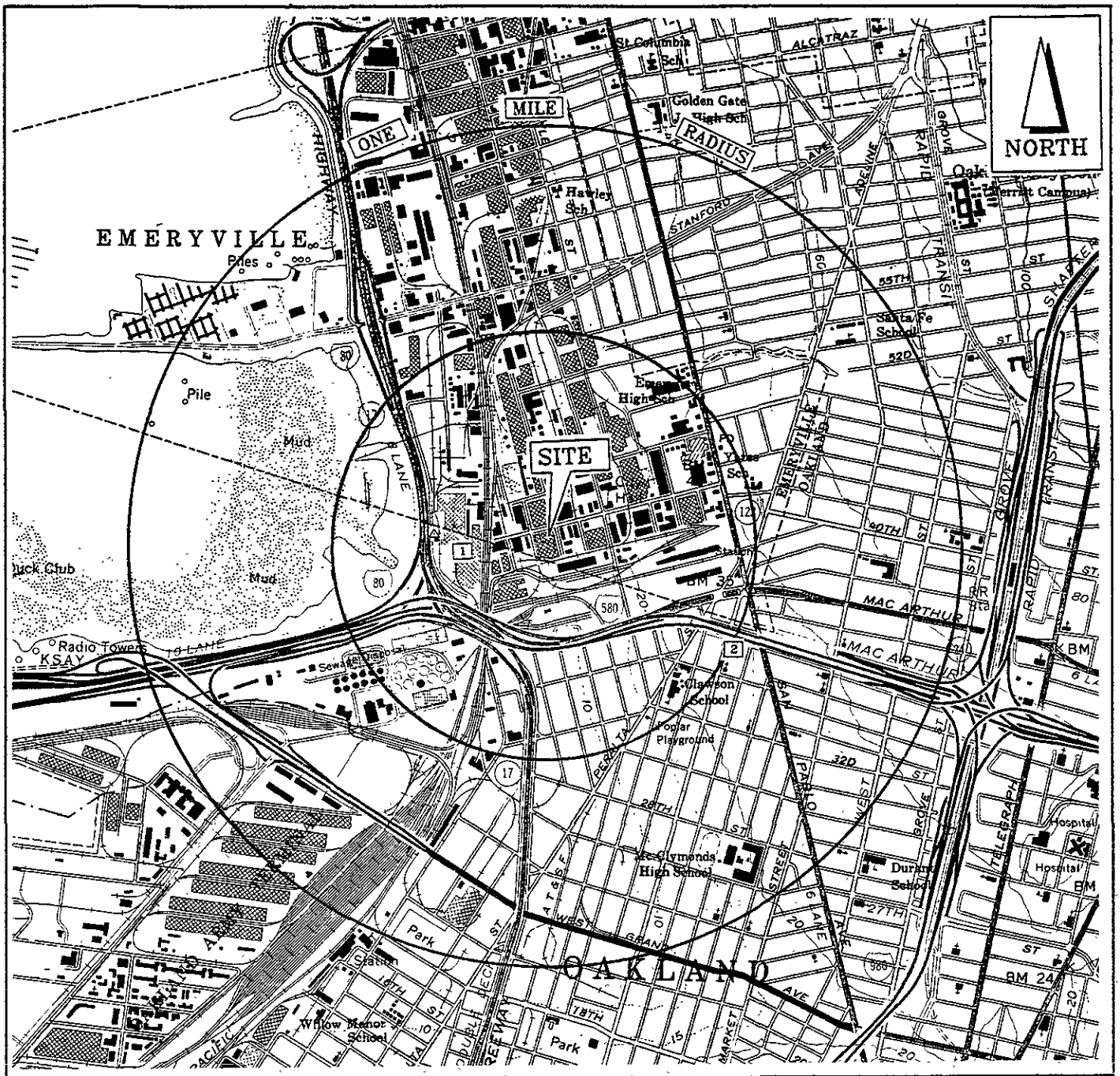
Coordinate of Nodes

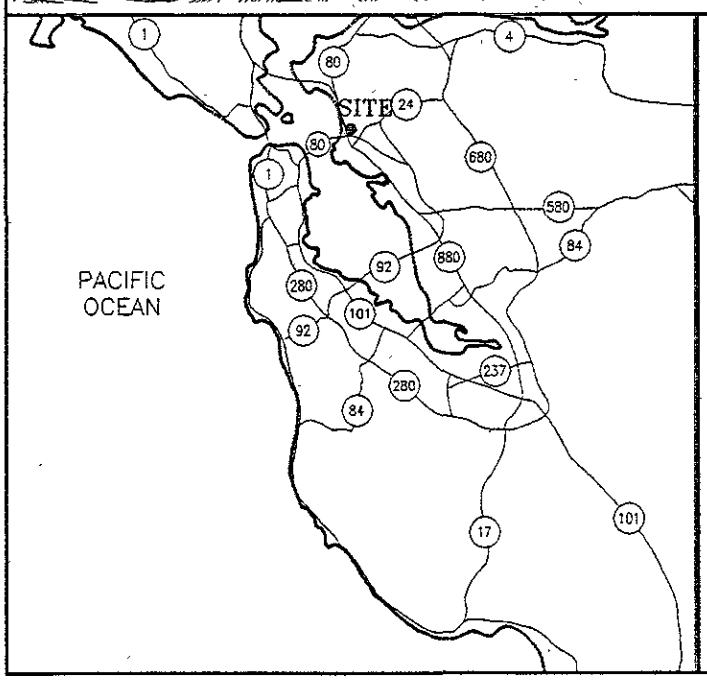
Easting	Northings	Benzene	Area of Node	Resultant
367.33	890.50	0.017	94	1.604
377.72	890.50	0.020	94	1.873
388.11	890.50	0.023	94	2.197
398.50	890.50	0.028	94	2.589
408.89	890.50	0.033	94	3.071
419.28	890.50	0.039	94	3.673
429.67	890.50	0.047	94	4.444
440.06	890.50	0.058	94	5.472
450.44	890.50	0.074	94	6.921
460.83	890.50	0.097	94	9.132
471.22	890.50	0.135	94	12.672
481.61	890.50	0.125	94	11.712
492.00	890.50	0.047	94	4.387
305.00	902.25	0.008	94	0.793
315.39	902.25	0.009	94	0.889
325.78	902.25	0.011	94	1.028
336.17	902.25	0.013	94	1.202
346.56	902.25	0.015	94	1.414
356.94	902.25	0.018	94	1.671
367.33	902.25	0.021	94	1.985
377.72	902.25	0.025	94	2.371
388.11	902.25	0.030	94	2.852
398.50	902.25	0.037	94	3.462
408.89	902.25	0.045	94	4.251
419.28	902.25	0.056	94	5.301
429.67	902.25	0.072	94	6.753
440.06	902.25	0.094	94	8.860
450.44	902.25	0.129	94	12.115
460.83	902.25	0.186	94	17.469
471.22	902.25	0.274	94	25.803
481.61	902.25	0.268	94	25.189
492.00	902.25	0.123	94	11.538
305.00	914.00	0.009	94	0.846
315.39	914.00	0.011	94	0.999
325.78	914.00	0.013	94	1.183
336.17	914.00	0.015	94	1.405
346.56	914.00	0.018	94	1.675
356.94	914.00	0.021	94	2.006
367.33	914.00	0.026	94	2.416
377.72	914.00	0.031	94	2.929
388.11	914.00	0.038	94	3.580
398.50	914.00	0.047	94	4.421

Table 2
Benzene Concentration Weighted Average Calculations

Coordinate of Nodes Easting	Northings	Benzene	Area of Node	Resultant
408.89	914.00	0.059	94	5.528
419.28	914.00	0.075	94	7.017
429.67	914.00	0.097	94	9.071
440.06	914.00	0.127	94	11.961
450.44	914.00	0.170	94	16.009
460.83	914.00	0.225	94	21.185
471.22	914.00	0.270	94	25.355
481.61	914.00	0.245	94	23.042
492.00	914.00	0.162	94	15.206
Total area and resultants			**8930**	**417.783**
Average concentration of benzene for area affected				***0.047***

Note:
Benzene concentrations given in milligrams per liter.
Node area given in square feet.





NOTES:

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP FROM USGS OAKLAND WEST (1959), 7.5–MINUTE TOPOGRAPHIC SERIES, PHOTOREVISED IN 1980

[2] NUMBERS REFER TO WATER WELLS DISCUSSED IN THE TEXT

0 1/4 1/2 1

SCALE, MILES

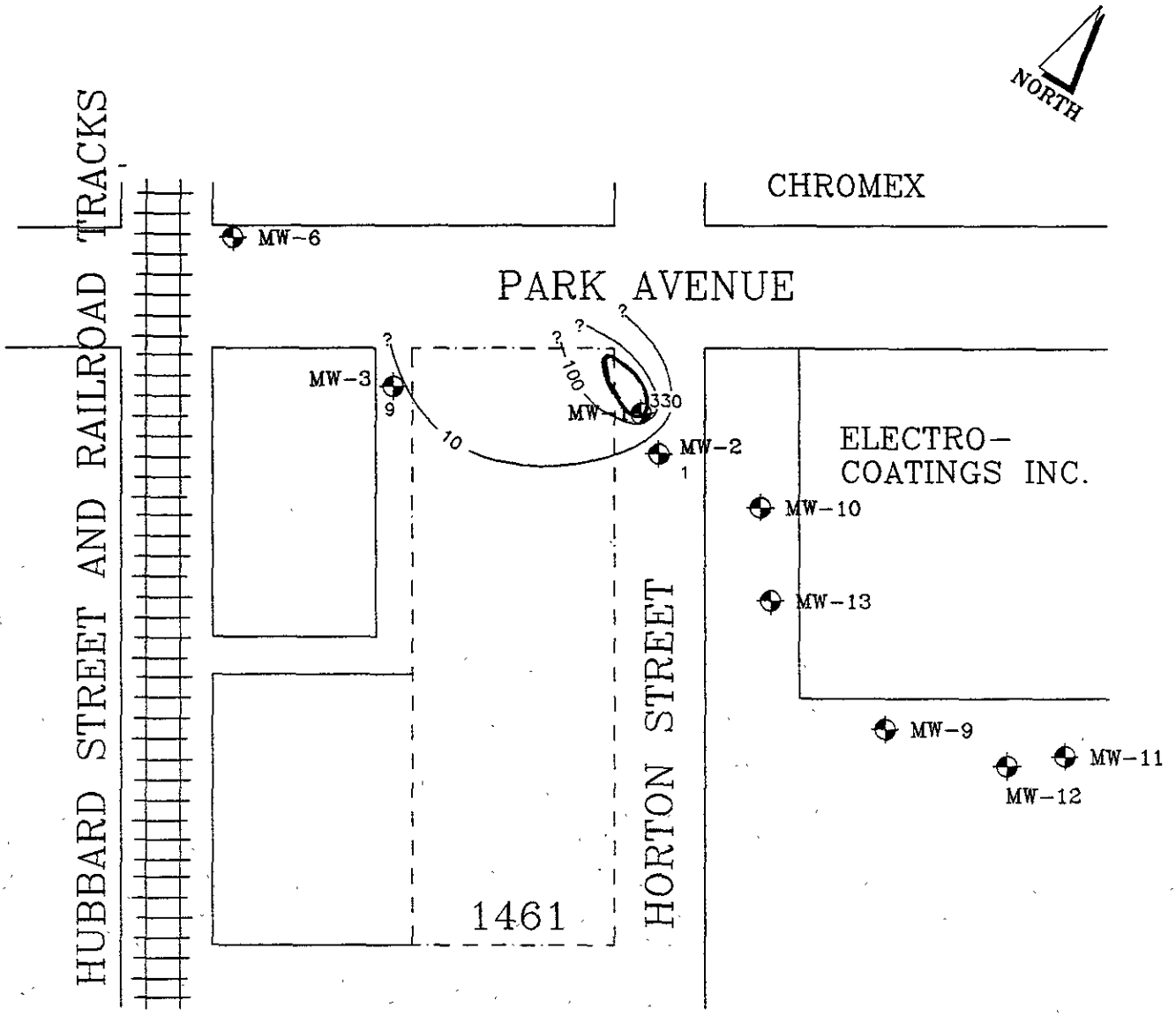
APPLIED GEOSCIENCES INC.

Environmental Consultants

SITE LOCATION MAP

WATSON TRUST PROPERTY
1461 PARK AVENUE
EMERYVILLE, CALIFORNIA

PROJECT NO. A953399 | FIGURE 1



EXPLANATION:

MW-3 — DESIGNATION AND LOCATION OF MONITORING WELLS.

9 — CONCENTRATION OF BENZENE IN GROUNDWATER (UG/L)

10 — CONTOUR OF BENZENE IN GROUNDWATER (UG/L)

CONTOUR OF 214 UG/L BENZENE IN GROUNDWATER

BUILDING BOUNDARY

0 100
SCALE, FEET

NOTES:

1) ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2) SITE PLAN BASED ON OBSERVATIONS MADE DURING SITE RECONNAISSANCE AND FIGURES PREPARED BY BLAKELY ENVIRONMENTAL INC., DATED JULY 1995.

APPLIED GEOSCIENCES INC.
Environmental Consultants

BENZENE CONCENTRATION CONTOUR MAP
WATSON TRUST
1461 PARK AVENUE
EMERYVILLE, CALIFORNIA

PROJECT NO. A953399 | FIGURE 2