ENVIRONMENTAL DEPARTMENT

Port of Oakland
530 Water Street
Oakland, CA 94607
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PORT OF OAKLAND

T R A N S M I T T A L

To: Ron Owcarz
Alameda County Health Dept.
Hazardous Materials Division
~~80 Swan Way, Rm. 200~~
Oakland, CA 94621

Date: 4-21-93

Project #:

Subject: Preliminary Groundwater Quality Investigation
Galbraith Golf Course, Oakland, CA

Enclosed please find 1 copies

Description: see subject

[x] As requested
[x] For your use
[ ] For your approval and return
[ ] For your review and comment
[ ] For return

COMMENTS:

Per your request, I am sending you this preliminary groundwater investigation report for Galbraith Golf Course. Call me with any questions at 510-272-1373.

Thanks. Patricia Murphy/Environmental

Transmitted by:
Patricia Murphy (ask)

PORT OF OAKLAND

October 9, 1991

Mr. Dennis Byrne
Alameda County
Department of Environmental Health
Hazardous Materials Program
80 Swan Way, Rm. 200
Oakland, CA 94621

SUBJECT: PRELIMINARY GROUNDWATER QUALITY INVESTIGATION, GALBRAITH GOLF COURSE, OAKLAND, CALIFORNIA

Dear Mr. Byrne:

Enclosed please find the preliminary report on groundwater quality at 1395 Middle Harbor Road in Oakland, California. A copy of the report has also been forwarded to the Regional Water Quality Control Board, San Francisco Bay Region.

If you have any questions or require additional information, please contact me at 272-1178.

Sincerely,

Andrew Clark-Clough
Environmental Scientist

ABC/abc

cc: Tom Gandesbery - RWQCB

wp\galcov.ltr

530 Water Street ■ Jack London's Waterfront ■ P.O. Box 2064 ■ Oakland, California 94604-2064
Telephone (415) 272-1100 ■ Fax 272-1172 ■ Telex 336-334 ■ Cable address, PORTOFOAK, Oakland

BASELINE

ENVIRONMENTAL CONSULTING

17 June 1991
S10-112A

Ms. Jody Zaitlin
Environmental Department
Port of Oakland
530 Water Street, 5th floor
Oakland, CA 94607

Subject: Documentation for Preliminary Groundwater Investigation at Galbraith Golf Course, Oakland, California

Dear Ms. Zaitlin:

Enclosed please find five copies of our report on the Preliminary Groundwater Quality Investigation conducted at the Galbraith Golf Course. Please do not hesitate to contact us if you have any questions or comments following your review of the document.

Sincerely,

Yane Nordhav
Principal
Reg. Geologist No. 4009

Kevin O'Dea
Senior Geologist

YN:KOD:cr/S91b
Enclosure

5900 Hollis Street, Suite D • Emeryville, CA 94608 • (415) 420-8686 • FAX (415) 420-1707

Report on

PRELIMINARY GROUNDWATER QUALITY INVESTIGATION
GALBRAITH GOLF COURSE
Oakland, California

Prepared for:

Port of Oakland
Oakland, California

June 1991

Prepared by:

BASELINE ENVIRONMENTAL CONSULTING
101 H Street, Suite L
Petaluma, California 94952
(707) 762-5233

S10-112A

TABLE OF CONTENTS

FIGURES

TABLES

APPENDIX

INTRODUCTION

The site is located within the boundaries of the Lew Galbraith Golf Course in Oakland, California (Figure 1). The site is bounded to the south by the southern boundary of the City of Oakland, to the north by Airport Drive, to the east by Doolittle Drive, and to the west by the Oakland International Airport (Figure 2). The golf course was developed on the former site of a landfill constructed near the margin of San Francisco Bay.

An investigation of the site history, prepared by Subsurface Consultants, Inc., (1991) determined that the project site was progressively filled over the period of time between the 1930s and 1960s. A garbage dump for the City of San Leandro was developed at the southeastern corner of the site. The landfilling operations progressed westward into marshlands at the margin of the Bay. The southwestern portion of the site, a former tidal mud flat, was raised above sea level by the placement of hydraulic fill from construction at the Metropolitan Oakland International Airport. The development of the Galbraith Golf Course was initiated in about 1965 by leveling the garbage and debris fill. A clayey soil cover was placed over the fill. Soil and debris were reportedly used to construct the landscaped mounds which characterize existing site topography.

Treated wastewater from the treatment facility operated by the East Bay Municipal Utility District, adjacent to the southern boundary of the site, has been used to irrigate the golf course. In 1987, prior to application of the wastewater to the golf course, a subsurface investigation, consisting of drilling and sampling of nine borings, was performed by Wahler and Associates (1987).

BASELINE Environmental Consulting was retained by the Port of Oakland (PORT) to conduct a preliminary investigation of groundwater quality and hydrogeologic conditions at the site. The investigation included the installation and sampling of nine groundwater monitoring wells. This report documents site activities and data obtained.

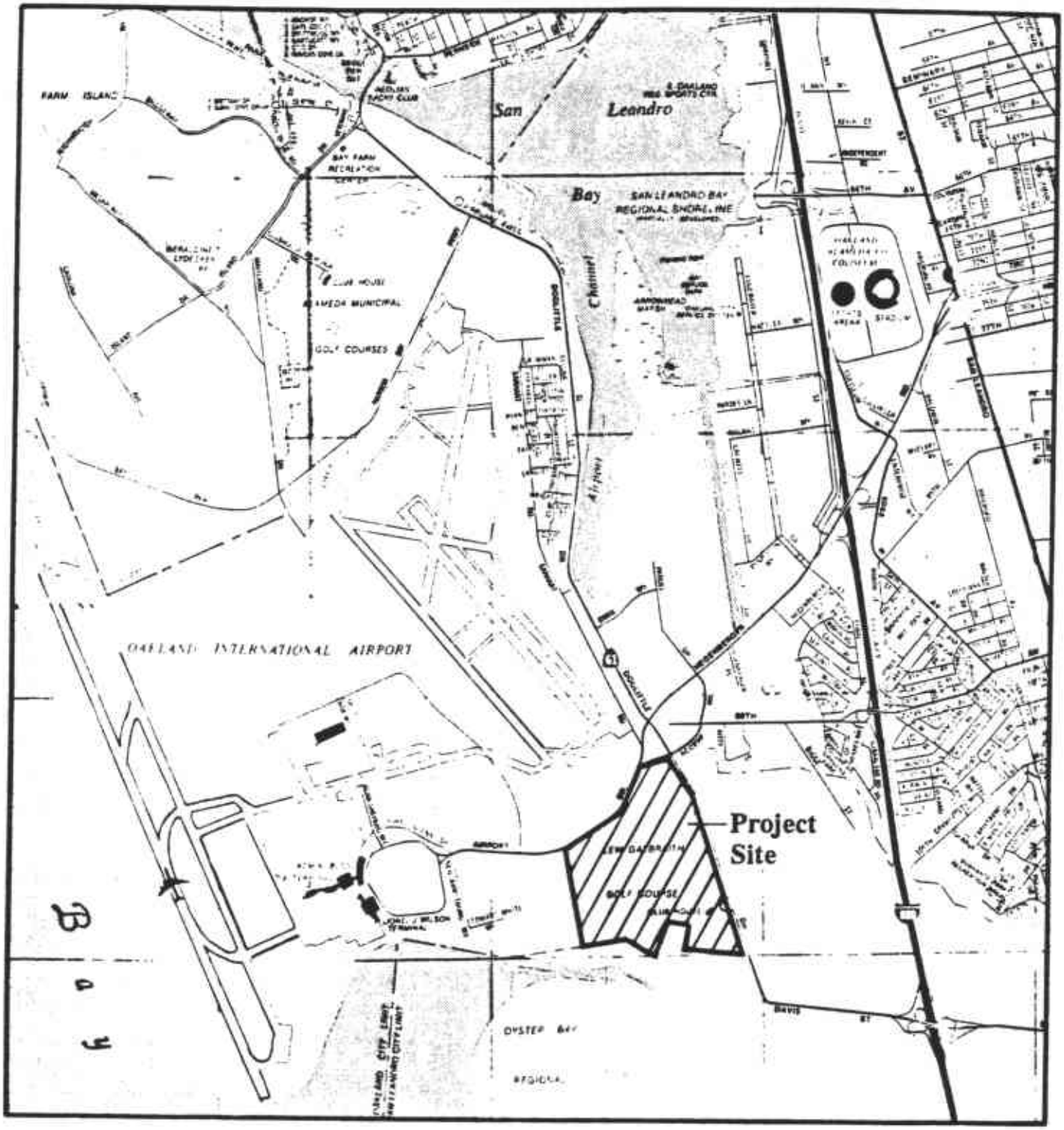
FIELD ACTIVITIES

Well Installation

During the period 22 through 25 April 1991, nine monitoring wells were installed at the site by Clear Heart Construction Company under supervision by a BASELINE geologist. The well locations are shown on Figure 2. The location of the wells were chosen to provide a monitoring network which would 1) provide coverage of the site, 2) provide hydrogeologic data from relatively higher and lower elevations, and 3) penetrate selected areas in which thick sequences of landfill material was expected.

REGIONAL LOCATION
Galbraith Golf Course
Oakland, California

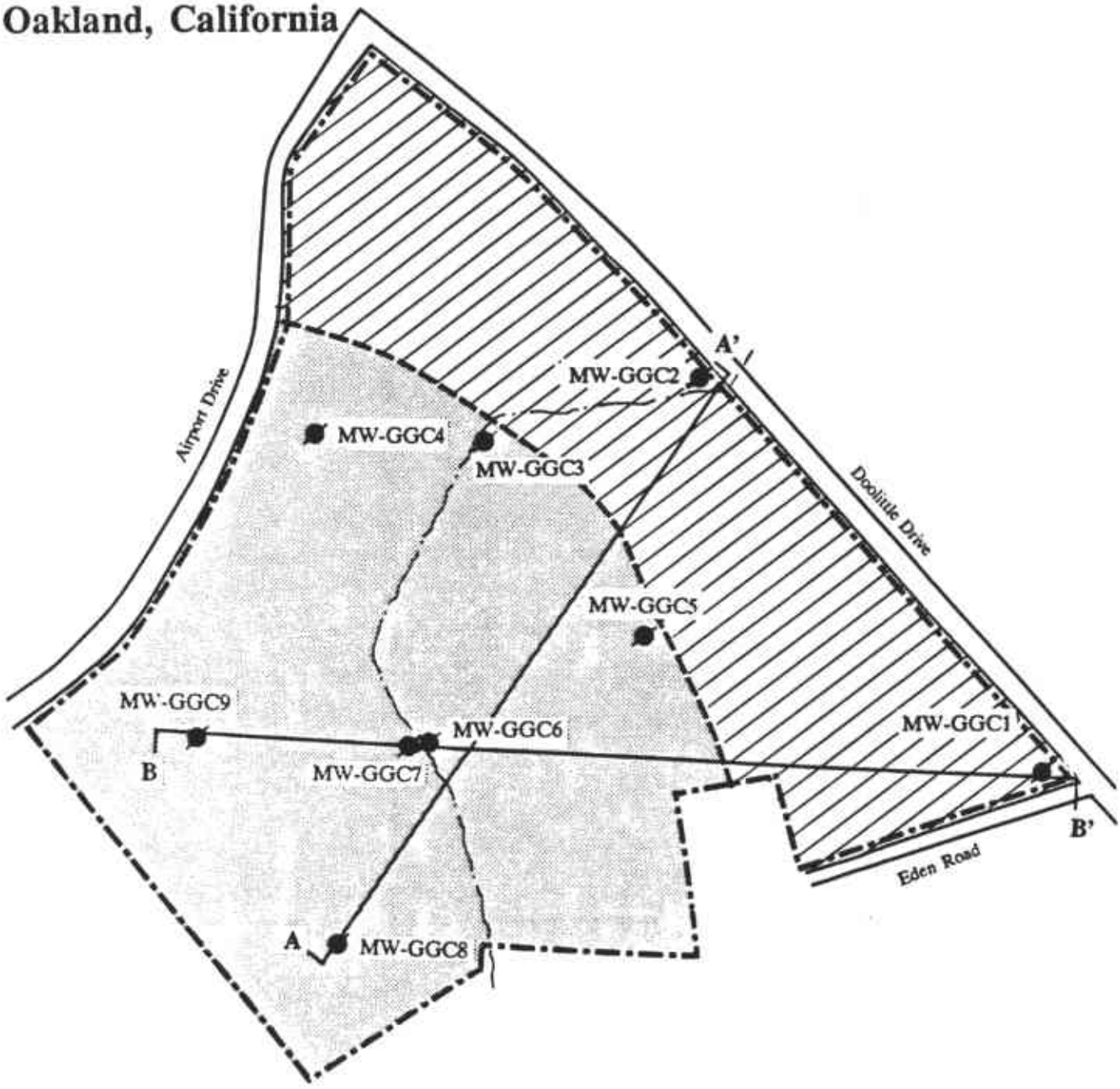
Figure 1



BASELINE

SITE PLAN
Galbraith Golf Course
Oakland, California

Figure 2



Legend

MW-GGC1 ● Monitoring Well Location	Quaternary Alluvium with Minor Fill
Drainage Channel	Man-Made Fill Covering Bay Muds
Approximate Position of 1853 Shoreline of San Francisco Bay	A — A' Position of Transects for Geologic Profiles
Project Site Boundary	

Approximate
0 600 Feet

BASELINE

S10-112A 6/11/91

Borings for monitoring well construction were drilled with nominal eight-inch diameter hollow-stem augers powered by a truck-mounted drilling rig. The borings were advanced to a depth of between one to two feet below the ground surface. At this depth, soil samples were collected at each location by driving a 2.5-inch modified California sampler fitted with clean, thin-walled brass sample tubes. One sample tube, at the shoe end of the sampler, was retained, capped, labeled, and stored in a cooled container. These soil samples were submitted under chain-of-custody to Curtis and Tompkins Inc., a state-certified laboratory in Berkeley, California, for analysis of Title 26 metals.

The borings were continued below the near-surface sampling depth with the hollow stem augers and a 5-foot continuous sampling barrel. The sample recovery within the landfill debris encountered in some of the borings was relatively poor compared to recovery within fill and natural soils. Penetration tests performed with a standard split spoon and California modified samplers were made at selected depths to provide data on the consistency of cohesive soils and compaction of granular soils. The borings were advanced to below the depth of the highest groundwater encountered during drilling. The boring logs are presented in Appendix A.

Following completion of the borings, two-inch PVC, schedule monitoring wells were installed at each boring location. Well screen slot size of 0.010 inch and #2/12 Lonestar sand were used in the well construction. The screened interval of each well was chosen on the basis of stratigraphy encountered at each location. The wells were installed through the annular space in the center of the hollow-stem augers. The sand filter and bentonite pellet seal for each well were tremied through the bottom of the augers which were incrementally raised during filter placement. The wells were completed by placement of an above-ground protective casing with a lockable lid. The well construction summaries, presented in Appendix A, document the details of well installation methods and materials.

Air Quality Monitoring

During drilling operations, air quality monitoring was performed at the project site by a BASELINE geologist. The monitoring program included field screening of ambient air quality in the working zone of the active drilling site and sampling of the air/vapor within the annular space of the hollow-stem augers. The working zone was monitored by mounting an Hnu model 101HW Hnu photo-ionization detector (PID) and Foxboro model 1286 GC-Port organic vapor analyzer, a flame ionization detector (FID), as close as possible to the drilled cuttings being brought to the surface during drilling. Unlike the PID, the FID is capable of detecting straight-chain aliphatics, including methane. The PID and FID readings were collected to evaluate the levels of organic vapors and the relative levels of methane within the soil gas emitted from the landfill refuse encountered in the borings.

The PID was also used in conjunction with the FID to evaluate air quality within the annular space of the hollow stem augers during drilling operations. The auger annular space was monitored by lowering the sampling pumps of the PID and FID into the augers after drilling conditions and sampling indicated that refuse had been encountered. The PID and FID readings are included in the Comments column of the boring logs, included in Appendix A.

In several cases, elevated levels of organic vapors were detected within the augers; at such times the drilling operation was halted. The vapors emanating from the augers were monitored with the PID and FID and drilling was not resumed until the vapor levels had dissipated to a level below 200 parts per million within the augers and less than 100 ppm in a downwind direction of the boring location.

Well Development

On 30 April and 1 May 1990, the monitoring wells at the site were developed by a BASELINE geologist. The wells were developed by placing clean PVC hosing to the bottom of well and extracting water at a slow rate with a pneumatic double-diaphragm pump. During the initial phase of development each well was surged with a surge block to facilitate removal of sediment from the sand filter. The wells were developed until very slightly turbid to clear water was produced from each well. Recharge rates for the wells at the site varied from 0.01 feet per minute at MW-GGC7 to more than four feet per minute at MW-GGC4. The groundwater removed during development was contained in sealed steel drum approved by the Department of Transportation (DOT) for the transportation of hazardous materials. The drums are temporarily stored on-site at each well location pending test results of groundwater sampling. The details of well development are documented on the well development forms included in Appendix B.

Groundwater Sampling

The nine monitoring wells installed during this preliminary investigation of hydrogeologic conditions at the Galbraith Golf Course were sampled on 6 and 7 May 1991. Following measurement of the static water level in the wells with a dual interface probe, each well was purged to remove potentially stagnant water from the wells before groundwater sampling was performed. The wells were purged by slowly pumping well water with a pneumatic double diaphragm pump through a clean PVC hose placed at the bottom of the well. The wells were purged until monitoring of the temperature, pH, and electrical conductivity of the evacuated water indicated that at least two of these physio-chemical parameters had stabilized and slightly turbid to clear water was being produced from the well. A minimum of five well casing volumes were removed from each well and the evacuated water was stored with development water in the DOT-approved drums. Documentation of the well sampling activities is provided on the Groundwater Sampling forms presented in Appendix B.

Following purging of the wells, groundwater samples were collected using a clean, disposable PVC bailer dedicated to each well. At each well, a sufficient volume of water was collected to fill the sample containers identified on the Groundwater Sampling forms in Appendix B. Each sample container was filled to capacity, the 40-ml vials were filled using an attachment to fill the containers from the bottom to reduce turbulence.

Upon collection, the groundwater sample containers were labeled and placed in a cooled container. The samples were transported under chain-of-custody to Curtis & Tompkins Ltd. laboratories in Berkeley for analysis of total dissolved solids, chloride, nitrates, Title 26 metals, purgeable halocarbons (Method 601), purgeable aromatics (Method 602), and pesticides (Method 608).

Surveying

The elevations of ground surface and top of the PVC well casing at each well location were surveyed by Bates and Bailey Land Surveyors, California licensed surveyors. The survey was initiated with reference to a City of Oakland benchmark at the northwestern corner of Doolittle Drive and Hegenberger Road. The elevation of the benchmark and the site elevations were referenced to the City of Oakland Datum. The City of Oakland Datum can be reconciled to the Port of Oakland Datum by adding 6.15 feet to the referenced City of Oakland elevations. The ground surface and top of casing elevations are shown in Table 1. The surveyor's report is presented in Appendix C.

Water Level Measurements

The depth to groundwater underlying the site was monitored several times during the investigation. During drilling, if conditions allowed identification, the depth of the highest groundwater encountered was measured with a dual interface probe or estimated by observation in samples collected from known depths. The low permeability of natural soils and some of the fill underlying the site made identification of the uppermost saturated zone difficult at most well locations. The water level within each well was measured upon completion of the well, before development, after development, and prior to and after groundwater sampling. The level of groundwater in all of the wells was measured within a two-hour period at low tide on 20 May 1991 to provide consistency of the water level measurement with respect to the tidal cycle. The water level elevations are presented in Table 2.

TABLE 1

WELL CASING AND GROUND SURFACE ELEVATIONS
Galbraith Golf Course, Oakland, CA

Well No.	CITY OF OAKLAND DATUM[1] Ground Surface Elevation[1] (ft)	CITY OF OAKLAND DATUM[1] Top of Casing Elevation[1] (ft)	PORT OF OAKLAND DATUM Ground Surface Elevation[2] (ft)	PORT OF OAKLAND DATUM Top of Casing Elevation[2] (ft)
MW-GGC1	5.83	7.93	11.98	14.08
MW-GGC2	1.75	4.22	7.90	10.37
MW-GGC3	2.14	4.79	8.29	10.94
MW-GGC4	8.28	10.95	14.48	17.10
MW-GGC5	13.35	15.92	19.50	22.07
MW-GGC6	8.49	11.34	14.64	17.49
MW-GGC7	4.99	8.82	11.14	14.97
MW-GGC8	8.16	10.44	14.31	16.59
MW-GGC9	11.26	13.67	17.41	19.82

Notes: Well locations are shown on Figure 2.

[1] Elevations surveyed by Bates and Bailey, Land Surveyors, referencing City of Oakland Datum
[2] Elevations corrected from City of Oakland Datum to Port of Oakland Datum by adding 6.15 ft. to City of Oakland Datum.

TABLE 2

GROUNDWATER ELEVATIONS
Galbraith Golf Course, Oakland, CA
(feet)

DATE	WELL NUMBER								
	MW-GGC1	MW-GGC2	MW-GGC3	MW-GGC4	MW-GGC5	MW-GGC6	MW-GGC7	MW-GGC8	MW-GGC9
5/20/91	7.32	4.64	6.16	7.62	7.35	7.05	6.66	2.19	2.01

Notes: Well locations are shown on Figure 2.
Elevations are shown as Port of Oakland Datum.
Water level measurements on 5/20/91 were collected within one hour at low tide.

HYDROGEOLOGY

The site is located on a filled surface on the margin of San Francisco Bay. Prior to the deposition of man-made fill, the bayshore, as mapped in 1853 (Nichols, 1971) was located within the site boundary. The position of the 1853 bayshore is shown on Figure 2. The eastern portion of the site was a historic marshland. The marsh had developed in a near-shore fluvial environment near the mouth of San Leandro Creek. The unconsolidated sediments underlying this area have been mapped as fine-grained alluvial deposits (Helley and others, 1979). Monitoring wells MW-GGC1, MW-GGC2, and MW-GGC3 are located within the former marshland area. The stratigraphy encountered at these locations, including clay, sandy clay, silts, silty sands, and occasional gravel lenses, reflects the past depositional environment.

West of the former bayshore, fine-grained marine sediments, commonly called Bay muds, were deposited within the Bay. Dark gray to black silty clays and clays are the predominant types of sediments underlying the heterogeneous fill materials used to raise the land surface above sea level. The Bay muds are soft to firm, saturated sediments with a high organic content which imparts the dark color to these deposits. The bay muds were encountered under the fill materials at the locations of MW-GGC4, MW-GGC5, MW-GGC6, MW-GGC7, MW-GGC8, and MW-GGC9. The contact between the bottom of the fill materials and the top of the bay muds is difficult to identify as fill materials have been pushed into the soft mud deposits. The overlying fill materials contain refuse and wood waste in a soil matrix.

Monitoring wells MW-GGC2, MW-GGC3, MW-GGC6, and MW-GGC7 were installed adjacent to a drainage channel which bisects the site (Figure2). Fine-grained sediments characterize the natural near-surface deposits at locations MW-GC2 and MW-GC3, located along the reach of the channel in the eastern portion of the site. At the locations of MW-6 and MW-7, the near-surface sediments include interbedded silty sands, sands, and clays. These sediments probably reflect recent deposition within and along the tidal channel. The geologic profile along southwest-northeast (A-A') and west-east (B-B') transects across the site are shown in Figures 3 and 4, respectively.

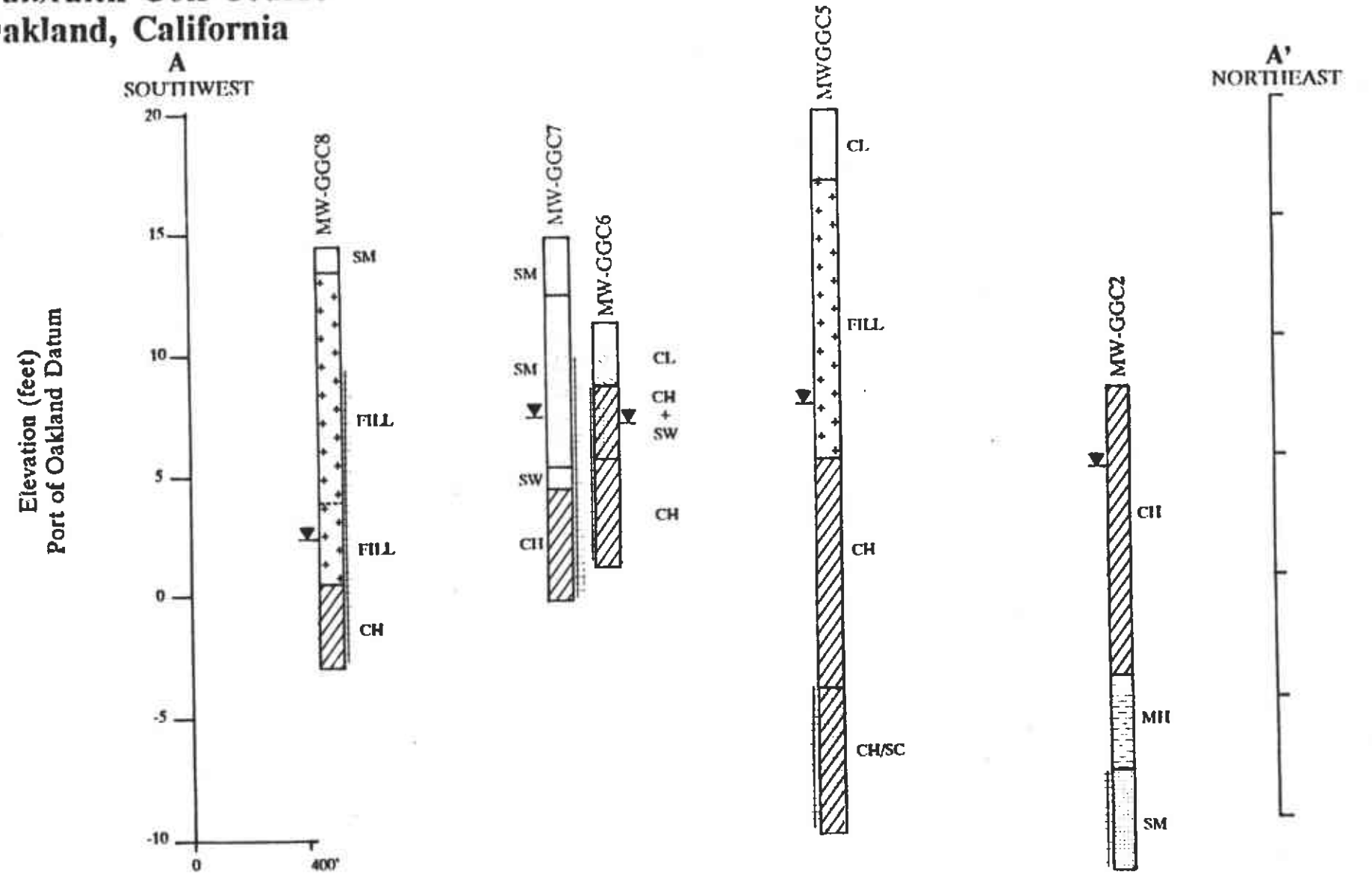
RESULTS OF ANALYTICAL TESTING

Shallow Soil Sampling

The results of analytical testing of soil samples, collected from depths ranging from 1.0 to 1.5 feet in each of the borings drilled for installation of the nine monitoring wells constructed for this investigation, are summarized in Table 3. The laboratory reports prepared by Curtis and Tompkins, Ltd. are presented in Appendix D. The soil samples were analyzed to evaluate the presence of potentially hazardous concentrations of metals. None of the Title 26 metals were detected at levels

GEOLOGIC PROFILE A-A'
Galbraith Golf Course
Oakland, California

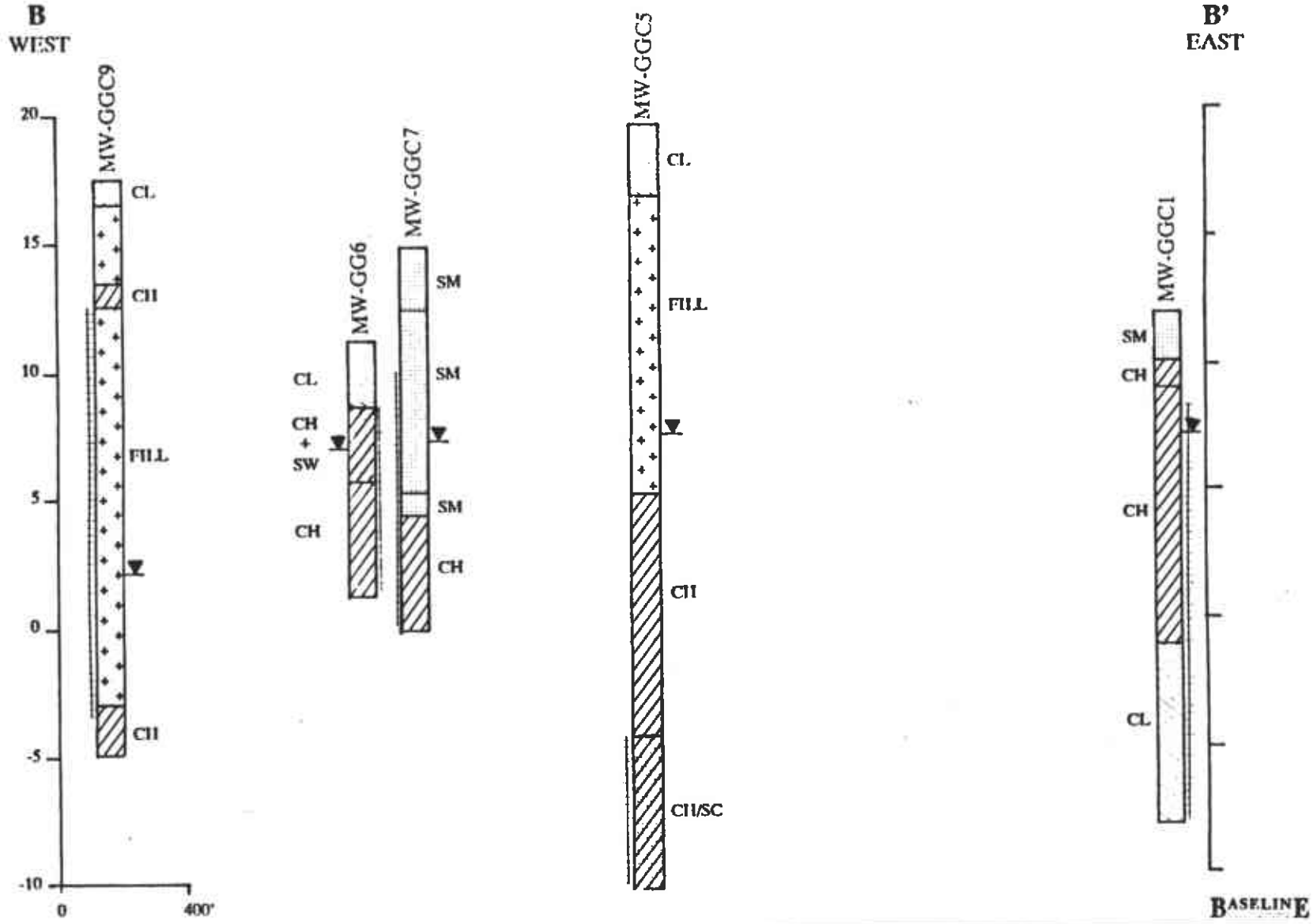
Figure 3



BASELINE

GEOLOGIC PROFILE B-B'
Galbraith Golf Course
Oakland, California

Figure 4



S10-112AO 6/7/91

TABLE 3

SUMMARY OF ANALYTICAL RESULTS, SOILS
Galbraith Golf Course, Oakland, CA
(mg/kg)

Well No.	Date	Depth (Ft.)	Sb	As	Ba	Be	Cd	Cr	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	V	Zn
MW-GGC1	4/22/91	1.5	<3.0	4.6	188	0.48	6.2	68.1	13.8	12.6	281	<0.09	<0.70	87.5	<1.6	<0.50	<6.3	39.1	428
MW-GGC2	4/22/91	1.5	<3.0	<3.5	203	0.62	2.3	44.6	12.0	37.7	<3.5	<0.10	<0.70	55.1	<3.5	<0.50	<6.3	39.4	57.1
MW-GGC3	4/23/91	1.0	<3.0	4.1	158	0.50	2.4	41.1	11.1	28.6	<3.5	<0.09	<0.70	49.7	<3.5	<0.50	<6.3	35.5	48.1
MW-GGC4	4/23/91	1.0	<3.0	6.1	156	0.38	3.4	61.3	13.5	68.2	68.2	0.44	<0.70	68.1	<3.5	<0.50	<6.3	36.4	156
MW-GGC5	4/23/91	1.0	<3.0	7.1	503	0.42	5.7	64.5	17.0	75.9	242	0.23	<0.70	189	<3.5	<0.50	<6.3	34.3	538
MW-GGC6	4/24/91	1.5	<3.0	<3.5	75.1	0.32	1.4	46.7	9.8	16.8	<3.5	<0.09	<0.70	33.4	<3.5	<0.50	<6.3	32.3	34.9
MW-GGC7	4/24/91	1.5	<3.0	4.5	203	0.54	3.1	43.0	13.1	57.3	<3.5	<0.09	<0.70	66.4	<3.5	<0.50	<6.3	55.8	58.9
MW-GGC8	4/25/91	1.5	<89.5	5.7	225	0.62	3.1	48.2	14.3	77.8	115	0.30	<0.70	46.1	<3.5	<0.50	<6.3	49.8	176
MW-GGC9	4/25/91	1.0	<3.0	3.2	204	0.43	3.6	44.5	13.8	61.7	307	0.14	<0.70	52.2	<3.5	<0.50	<6.3	43.1	263
STLC[1] (mg/L)				15.0	5.0	100	0.75	1.0	560	80	25	5.0	0.2	350	20	1.0	5.0	7.0	24250
TTLC[2]			500	500	10,000	75	100	2,500	8,000	2,500	1,000	20	3,500	2,000	100	500	700	2,400	5,000

Notes: <xx.xx = Less than laboratory reporting limit.
xx = Compounds identified above detection levels.
Sampling locations are shown in Figure 2.
Laboratory reports for the soil samples are included in Appendix C

[1] Soluble Threshold Limit Concentration presented in the California Code of Regulations, Title 26, Section 22-66699.
[2] Total Threshold Limit Concentration presented in the California Code of Regulations, Title 26, Section 22-66699.

above the total threshold limit concentrations (TTLC), the levels of the individual metals which identifies a material as hazardous under definitions put forth in the California Code of Regulations, Title 26.

The results indicate that arsenic (As), barium (Ba), cadmium (Cd), copper (Cu), lead (Pb), nickel (Ni), vanadium (V), and zinc (Zn) were detected at the site in concentrations above the soluble threshold limit concentration (STLC). Analysis of the soluble, or extractable, fraction of metals (the "WET" test), not performed as part of this investigation, involves a ten times dilution of the prepared sample. At five locations (MW-GGC1, MW-GGC4, MW-GGC5, MW-GGC8, and MW-GGC9), total lead concentrations in the sampled soil exceeded ten times the STLC for lead.

Groundwater

Groundwater samples collected from each of the wells were analyzed for volatile aromatic hydrocarbons (EPA method 8020), purgeable halocarbons (EPA method 8010), pesticides and polychlorobiphenyls (PCBs) (EPA method 8080), and dissolved Title 26 metals (various methods). The groundwater samples were also evaluated for the level of chloride (Cl), nitrate (NO_3), and total dissolved solids (TDS) to evaluate the overall quality of groundwater underlying the site. The results of the analytical testing of the groundwater samples are summarized in Table 4. The Table presents only those chemical species identified above the levels of detection. All chemical species evaluated by the test methods used to analyze the samples but not detected within the samples are identified in the laboratory reports presented in Appendix D.

The testing results of Cl and TDS indicate significant differences in groundwater collected along the eastern margin of the site relative to the remainder of the site. The chloride concentrations in samples collected from MW-GGC1 and MW-GGC2, 110 and 220 mg/L, respectively, were much lower than chloride levels throughout the rest of the site. The Cl concentration differences are paralleled by the relatively low total dissolved solids concentrations detected in samples collected from MW-GGC1 and MW-GGC2.

The TDS concentrations from the eastern site margin are likewise lower than for the remainder of the site, which are in excess of the 3,000 mg/L level of TDS considered by the State Water Resources Control Board (SWRCB) (Resolution No. 88-63) to be acceptable for public water supply systems. The TDS concentrations were reflected in field measurements of electrical conductivity (EC) collected during purging of the monitoring wells (Appendix B). The EC levels measured in groundwater samples collected from all wells except MW-GGC1 and MW-GGC2 were consistently above the SWRCB recommended level (5,000 μmhos/cm) for drinking water supplies.

Nitrates were identified in three wells, MW-GGC1, MW-GGC2, and MW-GGC3, located in the eastern portion of the site. The nitrate level measured in samples from these wells is below the

TABLE 4

SUMMARY OF ANALYTICAL RESULTS, GROUNDWATER
Galbraith Golf Course, Oakland, CA
6 and 7 May 1991
(mg/L)

Well No.	Sb	Ba	Cr	Co	Cu	Ni	V	Zn	Cl	NO_3	TDS	Methylene chloride	cis-1,2-dichloro-ethene	Trichloro-ethylene	Toluene
MW-GGC1	ND	0.0267	ND	ND	0.0226	ND	ND	ND	110	9.9	850	0.0093	0.0024	0.039	ND
MW-GGC2	ND	0.0775	ND	ND	0.0247	ND	ND	0.0144	240	36	910	ND	ND	ND	ND
MW-GGC3	ND	0.0681	ND	ND	0.0579	ND	ND	0.0388	3,100	29	7,000	0.0020	ND	ND	ND
MW-GGC4	ND	0.368	0.024	ND	0.0345	ND	0.0147	0.0165	4,000	ND	8,700	ND	ND	ND	ND
MW-GGC5	ND	0.0673	0.020	0.0227	0.0380	ND	ND	ND*	30,000	ND	56,000	ND	ND	ND	0.001
MW-GGC6	ND	0.0596	0.0112	ND	0.0746	ND	ND	0.0664	4,700	ND	11,000	ND	ND	ND	ND
MW-GGC7	ND	0.191	ND	ND	0.0756	0.0648	ND	0.0360	2,000	ND	6,100	ND	ND	ND	ND
MW-GGC8	89.5	0.953	0.0112	ND	0.0373	ND	ND	ND	12,000	47	23,000	ND	ND	ND	ND
MW-GGC9	ND	1.060	ND	ND	0.0241	ND	ND	ND	1,800	ND	4,900	ND	ND	ND	ND
Reporting Limit	0.060	0.005	0.010	0.018	0.010	0.010	0.010	0.010	15	5.0	10.0	0.001	0.001	0.001	0.001
MCL	--	1.00	0.05	--	1.00	--	--	5.00	250	45	500	--	--	0.005	--

Notes: Well locations are shown on Figure 2.
Laboratory reports are included in Appendix D.
MCL = Maximum Contaminant Levels, as listed in CCR Title 26, Sections 22-64444.5 and 22-64473.
Only chemical species above the levels of detection are listed.
A travel blank was also analyzed for EPA methods 8010 and 8020 for sampling events on 6 and 7 May 1991. No compounds were identified above the levels of detection.

MCL (45 mg/L) for nitrates in drinking water. Nitrates were also detected in MW-GGC8 at a concentration of 47 mg/L, slightly above the MCL.

Detectable levels of barium and copper were detected in all nine wells at the site. None of the samples contained copper in concentrations which exceed the maximum contaminant levels (MCL), set by the California Code of Regulations Title 26, for water used for drinking or culinary purposes. Barium was detected in MW-GGC9 at a concentration of 1.06 mg/L, slightly above the MCL of 1.0 mg/L. Antimony (Sb), Chromium (Cr), cobalt (Co), nickel (Ni), vanadium (V), and zinc (Zn) were detected at concentrations below the MCLs for these metals at some of the well locations.

Purgeable halocarbons were detected in samples collected from two of the wells installed at the site. Methylene chloride was detected in MW-GGC1 (0.009 mg/L) and MW-GGC3 (0.002 mg/L). These concentrations are above the MCL set for this compound (0.001 mg/L). Trichloroethylene and cis-1,2-dichloroethane were also detected at concentrations above the MCLs (0.001 mg/L) for these chemicals. Toluene, an aromatic hydrocarbon, was detected at the reporting limit (0.001 mg/L) in the sample collected from MW-GGC5. No other aromatic hydrocarbons were detected in any sample collected from the site.

CONCLUSIONS

- The water level measurements and water quality analysis collected as part of this investigation indicate that two distinct hydrogeologic systems underlie the Galbraith Golf Course site. The subsurface sampling of sediments under the site provides significant information for evaluation the two groundwater systems.

  The eastern portion of the site, as documented by information collected from monitoring wells MW-GGC1 and MW-GGC2, is underlain by natural sediments (with minor fill) which are representative of fine-grained alluvial deposits. These sediments were apparently deposited in a marsh setting at the mouth of San Leandro Creek. The water quality in MW-GGC1 and MW-GGC2 suggests that relatively fresh groundwater is carried within the shallow sediments of this depositional environment. The extent of this "freshwater" system cannot be defined on the basis of data collected during this investigation but may be controlled by the position of the historic bayshore location, as estimated by existing shoreline and geologic mapping. Although the direction and magnitude of the groundwater gradient within this system cannot be established based on existing data, groundwater discharge is probably directed west-southwesterly toward the Bay.

The hydrogeology of the western portion of the site reflects hydraulic interaction of the saline surface water of San Francisco Bay with groundwater held within fill placed along the bayshore. The thickness of refuse fill placed at the site is variable with the greatest thickness (approximately 13 feet) identified, as expected, at the most bayward locations, at MW-GGC8 and MW-GGC9. At these two locations, the fill extends to depths below the elevation of sea level. The groundwater levels measured at these locations is significantly lower than other monitoring well locations within the filled portion of the site, suggesting direct communication with the tidally-controlled surface waters of the Bay. At more landward locations, wells placed within fill do not extend to depths below sea level (MW-GGC3, MW-GGC4, and MW-GGC5); groundwater flow in those locations is more complex and may be controlled by position of the drainage channel, the elevation of water within the channel, and subsurface topography of the fill/Bay mud contact.

- The level of total dissolved solids (TDS) and electrical conductivity (EC) measurements for groundwater underlying the majority of the site indicate that these waters do not meet the criteria for a potential drinking water supply source, as defined by the State Water Resources Control Board. The quality of groundwater underlying the eastern portion of the site is marginal and does not meet the Maximum Contaminant Level (MCL) for TDS content for drinking water. The MCLs are exceeded for barium in MW-GGC9. Chloride concentrations exceed the MCL in all but one well (MW-GGC1), and the trichloroethylene (TCE) detected in MW-GGC1 exceeds the MCL for TCE.

- The detection of halocarbons and aromatic hydrocarbons in three wells at the site indicates isolated plumes of contaminants may be present within groundwater underlying the site. The extent and source of the plumes cannot be determined on the basis of the data collected for this preliminary investigation. The identification of methylene chloride, dichloroethene, and trichloroethylene in MW-GGC1 suggests that a source of industrial solvents is present near or upgradient of the eastern boundary of the site.

- Insufficient data are available to determine if detectable levels of metals within the surface soils at the site reflect background levels of metals within soils imported to the site as fill materials or residual levels of metals contained in irrigation waters applied to the site. The levels of lead detected at the site are above ten times the STLC and should be considered capable of releasing soluble lead to groundwater underlying the site. Significantly, lead was not detected within groundwater samples collected from any of the wells, suggesting that the release of lead to the groundwater is not currently occurring. The concentration of other detected metals are lower than levels considered hazardous, according to Title 26.

RECOMMENDATIONS

- The nine monitoring wells installed at the Galbraith Golf Course as part of this preliminary hydrogeologic investigation should be monitored monthly for groundwater level measurements to establish seasonal trends in groundwater levels. Measurement of groundwater levels in one well within fill expected to be in direct hydraulic communication with the Bay (MW-GGC8 or MW-GGC9) and one well penetrating the alluvial sediments in the eastern portion of the site (MW-GGC1 or MW-GGC2) should monitored throughout a minimum of two tidal cycles to evaluate the hydraulic influence of tide action on the site. The measurement of groundwater levels over the tidal cycles could be accurately collected by the temporary installation of pressure transducers within the well.

- Additional monitoring wells would provide data needed to evaluate the groundwater gradient direction and magnitude. The position of the additional wells should include locations within the area underlain by alluvial sediments in the eastern portion of the site. Minimally, two wells should be installed to evaluate the extent of TCE, DCE, and methlyene chloride in monitoring well MW-GGC1. An additional well should be installed northeast of the approximate position of the 1853 bayshore (the approximate westward limit of the alluvial deposits) to provide additional information on groundwater quality and gradient determinations.

REFERENCES

Subsurface Consultants, Inc., 1991, *Preliminary Geotechnical Engineering Investigation, Galbraith Dredge Disposal Site, Oakland, California*, prepared for the Port of Oakland, project No. SCI-133.002.

Wahler Associates, 1987, Galbraith Reclamation Project, prepared for the East Bay Municipal Utility District, Project No. EBM-110.

Nichols. D. R., and N. A. Wright, 1971, *Preliminary Map of Historic Margins of Marshlands, San Francisco Bay, CA*. USGS Open File Map, Scale 1:125,000.

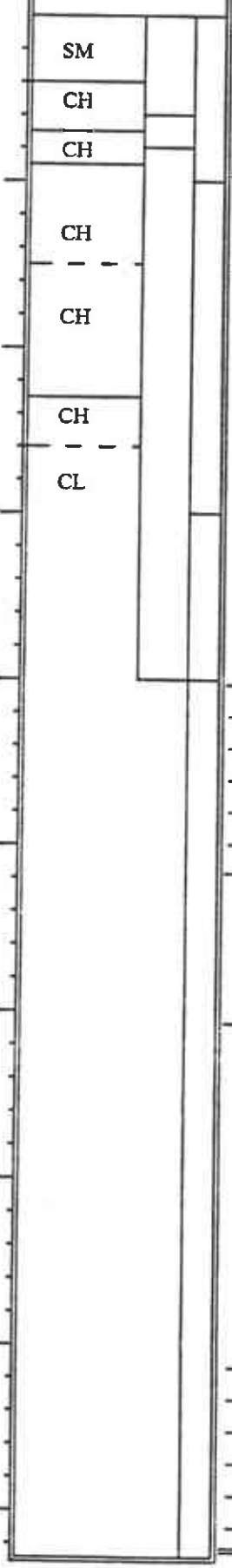
Helley, E. J., *et al.*, 1979, *Flatlands Deposits of the San Francisco Bay Region, California - Their Geology and Engineering Properties, and Their Importance to Comprehensive Planning*, in USGS Prof. Paper 943, 88 pp.

LIMITATIONS

The conclusions presented in this report are professional opinions based on the indicated data described in this report. They are intended only for the purpose, site, and project indicated. Opinions and recommendations presented herein apply to site conditions existing at the time of our study. Changes in the conditions of the subject property can occur with time, because of natural processes or the works of man, on the subject sites or on adjacent properties. Changes in applicable standards can also occur as the result of legislation or from the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or in part, by changes beyond our control.

APPENDIX A

WELL CONSTRUCTION SUMMARIES



[Scale: 1 inch = 5 feet]

WELL CONSTRUCTION SUMMARY

Project No.: S10-112A Well No: MW-GGC1

Project Name: Galbraith Golf Course
Location: 10505 Doolittle Drive
Oakland, CA

Date: 4/22/91
Personnel: WKS
Driller: Clear Heart Construction

DRILLING SUMMARY

Drill Rig: Failing
Auger/Bits: Hollow-stem cont. flight
Drilling Fluid: None
Boring Diameter (inch): 8
Boring Depth (feet): 20.0
Surface Completion: Stove pipe
Ground Surface Elevation (feet): 11.98 PORT Datum
TOC Elevation (feet): 14.08 PORT Datum

WELL DESIGN

Basis: X Geologic Log ___ Geophysical Log

Casing Diameter (inch)	Material + Length (feet)	Slot Size	Interval (feet bgs)
2	PVC 7.1	Blank	+2.10-5
2	PVC 10.0	10	5-15
2	PVC 5.0	10	15-20
Centralizer None			
Filter Material Lonestar Sand #2/12			4-20
Bentonite Pellets			3-7
Cement Neat			0-3

WATER LEVELS

	Date	Time	Depth (ft bgs)
During Drilling:	4/22/91	11:50	≈13
After completion:	4/24/91	10:00	4.6
Before development:	4/30/91	09:33	6.46

COMMENTS

CONSTRUCTION TIME LOG

Task	Start Date	Start Time	Finish Date	Finish Time
Drilling:	4/22/91	09:30	4/22/91	11:55
Geophys Logging:				
Casing:	4/22/91	12:04	4/22/91	12:00
Filter Placement:	4/22/91	12:10	4/22/91	13:30
Cementing:	4/24/91	15:30	4/24/91	15:40
Development:	4/30/91	09:54	4/30/91	10:25
Other:				

WELL DEVELOPMENT

Method: Double diagphram pump Date: 4/30/91

Time	Gallons	Appearance
09:54	3	Very turbid
10:09	7	Clear
10:25	12	Clear

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DRILLING LOG

Location	Galbraith Golf Course	Boring No.	MW-GGC1
Driller	Clear Heart Construction	Project No.	S10-112A
Method	Hollow-stem cont. flight	Date	4/22/91
Logger	WKS Datum 11.98 feet Bore size 8-inch	Casing size	None

Depth	Graphic	Lithology	Notes
0			
	SM	Dark brown silty SAND with trace of clay, fine-grained, medium dense, some rootlets, dry (fill).	<5% clay ≈30% silt 8-10-16 (blow count)
1			
			≈5% sand ≈35% gravel
2			
	CH	Black gravelly CLAY, medium to high plasticity, stiff, moist (fill).	0 ppm HNu and OVA
3		Gravel up to 2-inch diameter, subrounded, hard clasts.	
	CH	Black CLAY, medium to high plasticity, soft to firm, moist.	≈15% silt
4			
5			
	CH	Mottled gray to light gray sandy CLAY, high plasticity, very fine-grained, caliche nodules, stiff, moist.	≈20% sand Strong reaction with HCL
6			
		Increase in sand grain size.	
7			
			2-foot recovery for 5-to 10-foot sampling interval
8	CH	Very dark gray CLAY, medium to high plasticity, soft, moist.	≈10% silt
9			
10			

Scale: 1 inch = 1.5 feet

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DRILLING LOG

Location Galbraith Golf Course
Driller Clear Heart Construction
Method Hollow-stem cont. flight
Logger WKS Datum 11.98 feet Bore size 8-inch

Boring No. MW-GGC1
Project No. S10-112A
Date 4/22/91
Casing size None

Depth	Graphic	Lithology	Notes
10	CH		
		Minor slickensided surfaces, becoming wet, very soft.	
11			
12	CH	Greenish gray CLAY with sand, medium to high plasticity, firm to hard, very fine-grained sand, caliche nodules, moist.	≈20% sand
13			
	CL	Yellowish brown, slightly mottled with gray sandy CLAY, low to medium plasticity, very fine-grained	≈30% sand
14		sand, some sand lenses or layers; very moist.	
15			
16			
17			3-foot recovery for 15- to 20-foot sampling interval
18		Increase in sand content.	≈35-40% sand at 18 feet
19			
20		Total depth = 20 feet	

Scale: 1 inch = 1.5 feet

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DRILLING LOG

Location	Galbraith Golf Course	Boring No.	MW-GGC2
Driller	Clear Heart Construction	Project No.	S10-112A
Method	Hollow-stem cont. flight	Date	4/22/91
Logger	WKS Datum 7.90 feet Bore size 8-inch	Casing size	None

Depth	Graphic	Lithology	Notes
0			
	CH	Very dark gray to black CLAY with silt, medium to high plasticity, soft, rootlets, very moist.	≈10% silt
1		Minor slickensided surfaces.	3-4-7 (blow count)
2			
			3-5-7-8
3		Becomes mottled, dark gray and gray, firm, increase in moisture.	0 ppm HNu and OVA
			Strong reaction with HCL
4			
5			
6		Becomes very soft, slickensided, friable, some free water between 6 and 8 feet.	
7			
8			
			3.8-foot recovery for 5- to 10-foot sampling interval
9			
10	CH		

Scale: 1 inch = 1.5 feet

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DRILLING LOG

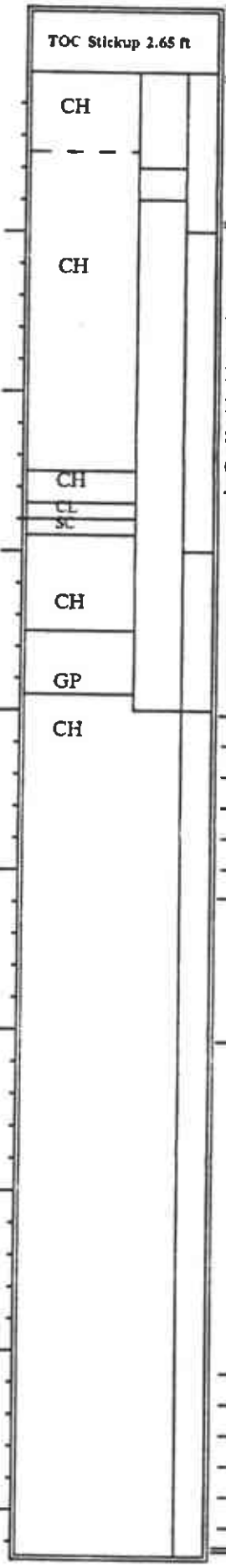
Location	Galbraith Golf Course	Boring No.	MW-GGC2
Driller	Clear Heart Construction	Project No.	S10-112A
Method	Hollow-stem cont. flight	Date	4/22/91
Logger	WKS Datum 7.90 feet Bore size 8-inch	Casing size	None

Depth	Graphic	Lithology	Notes
10	CH	Gray silty CLAY, medium to high plasticity, firm to very firm, rootlets, very moist. Slickensided surfaces, caliche nodules.	≈35% silt 3.5-foot recovery for 5- to 10-foot sampling interval
11		Increases in sand content, very fine-grained, (11-12 feet), increase in moisture, stratified.	
12	MH	Light gray SILT with sand, medium to high plasticity, very stiff, some hard caliche nodules, very moist to wet.	≈15% sand ≈35% clay Strong reaction with HCL
13			
14	MH	Pale brown, slightly mottled with red oxide stains, SILT with sand, high plasticity, soft, very moist.	≈15% clay ≈20% sand Strong reaction with HCL
15			
16	SM-SC	Mottled greenish gray to olive silty SAND with clay, very fine-grained, low plasticity, soft, rootlets, shell fragments, wet.	≈15% clay ≈25% silt
17			
18	SM	Olive silty SAND with trace of clay, fine-grained, soft, wet.	≈<5% clay ≈15% silt Very weak reaction with HCL
19			
20		Total depth = 20 feet	

Scale: 1 inch = 1.5 feet

(6/13/91)

Signature _____



[Scale: 1 inch=5 feet]

WELL CONSTRUCTION SUMMARY

Project No.: S10-112A Well No: MW-GGC3

Project Name: Galbraith Golf Course
Location: 10505 Doolittle Drive
Oakland, CA

Date: 4/23/91
Personnel: WKS
Driller: Clear Heart Construction

DRILLING SUMMARY

Drill Rig: Failing
Auger/Bits: Hollow-stem cont. flight
Drilling Fluid: None
Boring Diameter (inch): 8
Boring Depth (feet): 20.0
Surface Completion: Stove pipe
Ground Surface Elevation (feet): 8.29 PORT Datum
TOC Elevation (feet): 10.94 PORT Datum

WELL DESIGN

Basis: X Geologic Log ___ Geophysical Log

Casing Diameter (inch)	Material + Length (feet)	Slot Size	Interval (feet bgs)
2	PVC 7.7	Blank	+2.65-5
2	PVC 10	10	5-15
2	PVC 5	10	15-20
Centralizer	None		
Filter Material	Lonestar Sand #2/12		4-20
Bentonite	Pellets		3-7
Cement	Neat		0-3

WATER LEVELS

	Date	Time	Depth (ft bgs)
During Drilling:	4/23/91	09:30	≈14.5
After completion:	4/23/91		None
Before development:	4/30/91	12:51	4.55

COMMENTS

CONSTRUCTION TIME LOG

Task	Start Date	Start Time	Finish Date	Finish Time
Drilling:	4/23/91	8:14	4/23/91	9:45
Geophys Logging:				
Casing:	4/23/91	9:50	4/23/91	10:55
Filter Placement:	4/23/91	10:02	4/23/91	10:55
Cementing:	4/24/91	16:12	4/24/91	16:18
Development:	4/30/91	12:51	4/30/91	14:21
Other:				

WELL DEVELOPMENT

Method: Double diaphragm pump Date: 5/1/91

Time	Gallons	Appearance
12:58	5	Very turbid
13:06	9.5	Turbid
13:17	14	Very slightly turbid
13:25	18.5	Very slightly turbid
13:40	23	Very slightly turbid

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DRILLING LOG

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Location	Galbraith Golf Course	Boring No.	MW-GGC3
Driller	Clear Heart Construction	Project No.	S10-112A
Method	Hollow-stem cont. flight	Date	4/23/91
Logger	WKS Datum 8.29 feet Bore size 8-inch	Casing size	None

Depth	Graphic	Lithology	Notes
0			
	CH	Very dark brown CLAY with silt, medium to high plasticity, firm, rootlets, wood pieces, moist.	~10% silt
1			3-4-5 (blow count)
		Becoming stained, red brown.	0 ppm HNu and OVA
2			
	CH	Very dark gray CLAY with trace of silt, moist to very moist.	
3			
4			0 ppm HNu
5		Increase in silt content up to 15%, firm.	5-foot recovery for 5- to 10- foot sampling interval Weak reaction with HCL
6			
7			
8			
9			
10			

Scale 1 inch = 1.5 feet

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DRILLING LOG

Location	Galbraith Golf Course	Boring No.	MW-GGC3
Driller	Clear Heart Construction	Project No.	S10-112A
Method	Hollow-stem cont. flight	Date	4/23/91
Logger	WKS Datum 8.29 feet Bore size 8-inch	Casing size	None

Depth	Graphic	Lithology	Notes
10	CH	Increase in silt content up to 35% silt	5-foot recovery for 10- to 15-foot sampling interval
11			
12			
13	CH	Greenish gray silty CLAY, medium to high plasticity, firm, hard caliche nodules, rootlets, moist.	≈35% silt Strong reaction with HCL
14	CL	Greenish gray sandy CLAY with silt, low to medium plasticity, very fine-grained, soft, very moist.	≈10% silt ≈40% sand Strong reaction with HCL
	SC	Yellowish brown clayey SAND, fine-grained, loose, red oxide-stained streaks, very moist to wet.	≈30% clay
15	CH	Pale olive silty CLAY with trace of black coarse-grained sand, ¼-inch diameter, high to medium plasticity, firm, caliche nodules, very moist.	≈2% coarse-grained sand ≈30% silt Strong reaction with HCL
16			
17		Increase in silt content at 17 feet.	
18	GP	Brown poorly-graded GRAVEL with sand, fine- to medium-grained, wet. Angular to subrounded hard fine clasts up to ½-inch diameter, some flat and elongated.	≈20% sand
19		Yellowish brown sandy CLAY with silt, very fine-grained, medium to high plasticity, firm, wet.	0 ppm HNu ≈35% sand
20	CH	Some black-stained areas with increase in silt content and decrease in sand content. Total depth = 20 feet	≈10% silt

Scale: 1 inch = 1.5 feet

(6/13/91)

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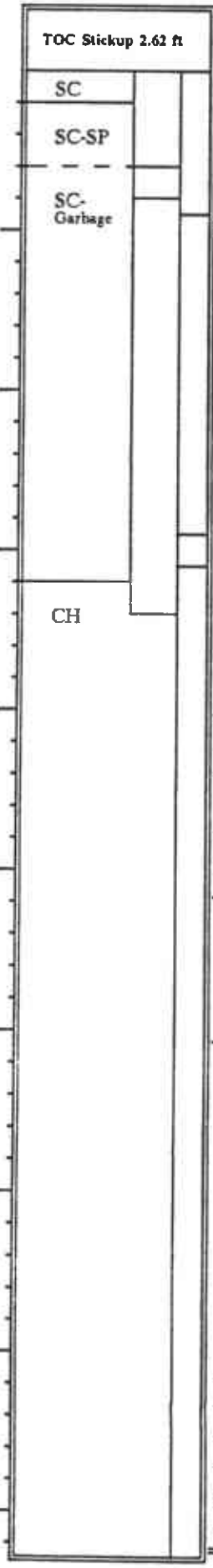

[Scale: 1 inch=5 feet]

WELL CONSTRUCTION SUMMARY

Project No.: S10-112A Well No: MW-GGC4

Project Name: Galbraith Golf Course
Location: 10505 Doolittle Drive
Oakland, CA

Date: 4/23/91
Personnel: WKS
Driller: Clear Heart Construction

DRILLING SUMMARY

Drill Rig: Failing
Auger/Bits: Hollow-stem cont. flight
Drilling Fluid: None
Boring Diameter (inch): 8
Boring Depth (feet): 17.0
Surface Completion: Stove pipe
Ground Surface Elevation (feet): 14.48 PORT Datum
TOC Elevation (feet): 17.10 PORT Datum

WELL DESIGN

Basis: X Geologic Log ___ Geophysical Log

Casing Diameter (inch)	Material + Length (feet)	Slot Size	Interval (feet bgs)
2	PVC 7.4	Blank	+2.67-4.7
2	PVC 10	10	4.7-14.7
2	PVC 1	10	14.7-15.7
Centralizer None			
Filter Material Lonestar Sand #2/12			4-17
Bentonite Pellets			3-4
Cement Neat			0-3

WATER LEVELS

	Date	Time	Depth (ft bgs)
During Drilling:	4/23/91	11:25	≈7.75
After completion:	4/24/91	10:15	≈7.5
Before development:	5/1/91	09:40	9.35

COMMENTS

CONSTRUCTION TIME LOG

Task	Start Date	Start Time	Finish Date	Finish Time
Drilling:	4/23/91	11:15	4/23/91	13:05
Geophys Logging:				
Casing:	4/23/91	13:10	4/23/91	13:15
Filter Placement:	4/23/91	13:16	4/23/91	14:25
Cementing:	4/24/91	16:30	4/24/91	16:40
Development:	5/1/91	09:43	5/1/91	10:10
Other:				

WELL DEVELOPMENT

Method: Double diaphragm pump Date: 5/1/91

Time	Gallons	Appearance
09:43	4.5	Very turbid
09:53	9	Very slightly turbid
10:04	13.5	Very slightly turbid
10:10	18	Very slightly turbid

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DRILLING LOG

Location	Galbraith Golf Course	Boring No.	MW-GGC4
Driller	Clear Heart Construction	Project No.	S10-112A
Method	Hollow-stem cont. flight	Date	4/23/91
Logger	WKS Datum 14.48 feet Bore size 8-inch	Casing size	None

Depth	Graphic	Lithology	Notes
0	SC	Brown, poorly-graded SAND with clay, trace of silt gravel, very fine-grained sand, low plasticity clay, soft, rootlets, damp to dry. Clasts up to ½-inch diameter, hard and angular.	≈5% gravel ≈5% silt ≈25% clay
1			5-4-4 (blow count)
2	SC-SP	Reddish brown clayey SAND, fine-grained, some clayey aggregates, low plasticity, soft to firm, iron staining, damp to dry, (fill).	0 ppm HNu
3	SC	Very dark gray to black clayey SAND, fine-grained, low plasticity, firm, wood debris, moist.	≈25% clay
4			2-3-3 0 ppm HNu and OVA
5	Garbage		A lot of wood chips
6			No recovery for 5-10-foot sampling interval
7			Hard and large debris fragments from 5.5-7.0 feet
8			Drilling becoming easier at 7 feet
9			Water encountered at 7.75 feet
10			

Scale: 1 inch = 1.5 feet

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DRILLING LOG

Location	Galbraith Golf Course	Boring No.	MW-GGC4
Driller	Clear Heart Construction	Project No.	S10-112A
Method	Hollow-stem cont. flight	Date	4/23/91
Logger	WKS Datum 14.48 feet Bore size 8-inch	Casing size	None

Depth	Graphic	Lithology	Notes
10	Garbage	Predominantly garbage material. Some plaster, plastic, glass, wood chips, ceramic pieces, tin cans, and brick.	No recovery for 10-15 feet
11			
12			
13			
14			
15			3-3-4-6 Predominantly wood chips
16	CH	Gray silty CLAY, medium to high plasticity, firm, caliche nodules and rootlets, wet.	≈15% silt
17		Total depth = 17.0 feet	100 ppm peak HNu 500 ppm peak OVA Strong reaction with HCL
18			
19			
20			

Scale: 1 inch = 1.5 feet

(6/13/91)

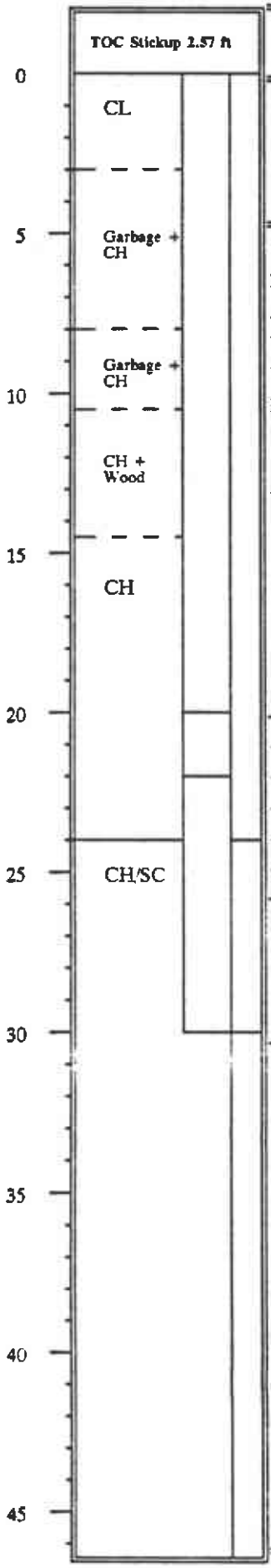
Signature _____

WELL CONSTRUCTION SUMMARY

Project No.: S10-112A Well No: MW-GGC5

Project Name: Galbraith Golf Course
Location: 10505 Doolittle Drive
Oakland, CA

Date: 4/23/91
Personnel: WKS
Driller: Clear Heart Construction



(Scale: 1 inch=5 feet)

DRILLING SUMMARY

Drill Rig: Failing
Auger/Bits: Hollow-stem cont. flight
Drilling Fluid: None
Boring Diameter (inch): 8
Boring Depth (feet): 30.0
Surface Completion: Stove pipe
Ground Surface Elevation (feet): 19.50 PORT Datum
TOC Elevation (feet): 22.07 PORT Datum

WELL DESIGN

Basis: X Geologic Log ___ Geophysical Log

Casing Diameter (inch)	Material + Length (feet)	Slot Size	Interval (feet bgs)
2	PVC 6.6	Blank	+2.57-4.0
2	PVC 10	Blank	4.0-14.0
2	PVC 10	Blank	14.0-24.0
2	PVC 6	10	24-30

Centralizer: None	
Filter Material: Lonestar Sand #2/12	22-30
Bentonite: Pellets	20-22
Cement: Neat	0-20

WATER LEVELS

	Date	Time	Depth (ft bgs)
During Drilling:	4/23/91		None
After completion:	4/24/91		None
Before development:	5/1/91	15:20	14.41

COMMENTS

CONSTRUCTION TIME LOG

Task	Start Date	Start Time	Finish Date	Finish Time
Drilling:	4/23/91	15:30	4/29/91	10:30
Geophys Logging:				
Casing:	4/24/91	10:30	4/24/91	12:42
Filter Placement:	4/24/91	10:45	4/24/91	11:13
Cementing:	4/24/91	11:37	4/24/91	12:12
Development:	5/1/91	10:47	5/1/91	12:16
Other:				

WELL DEVELOPMENT

Method: Double diaphragm pump Date: 5/1/91

Time	Gallons	Appearance
11:22	5	Turbid
11:48	9.5	Slightly turbid
12:16	13	Very slightly turbid

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DRILLING LOG

Location	Galbraith Golf Course	Boring No.	MW-GGC5
Driller	Clear Heart Construction	Project No.	S10-112A
Method	Hollow-stem cont. flight	Date	4/23/91
Logger	WKS Datum 19.50 feet Bore size 8-inch	Casing size	None

Depth	Graphic	Lithology	Notes
0			
	CL	Dark brown to very dark gray sandy CLAY with gravel, low to medium plasticity. firm, fine-grained sand,	≈15% gravel ≈35% sand
1		rootlets, damp to dry.	4-6-10 (blow count)
		1- to 2-inch hard subangular clasts.	Only 6-foot recovery
			Newspaper and wood chips
2			0 ppm HNu
3			Hit wood pieces, hit sampler bouncing
	Garbage and CH	Dark gray to black silty CLAY, medium to high plasticity, stiff to firm with garbage debris	33 blows for 3 inches
4		including wood pieces, moist.	Drilling more difficult at 4-5 feet
5			Spring wire, wood chips, paper book pages
6			Hard drilling at 5 feet (wood?)
			500 ppm HNu
			0 ppm VOA on tip of 5-foot sampler
7			Wood chips
			≈10% silt
8			
	Garbage and CH	Very dark gray to black CLAY with garbage debris, medium to high plasticity, soft, moist.	Becoming harder at 8 feet; wood pieces
9			
10			

Scale: 1 inch = 1.5 feet

(6/13/91)

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DRILLING LOG

Location	Galbraith Golf Course	Boring No.	MW-GGC5
Driller	Clear Heart Construction	Project No.	S10-112A
Method	Hollow-stem cont. flight	Date	4/23/91
Logger	WKS Datum 19.50 feet Bore size 8-inch	Casing size	None

Depth	Graphic	Lithology	Notes
10	Garbage and CH		Debris blocked tip of 5-foot sampler Little recovery for 10- to 15-foot sampling interval
11	CH and Wood	Very dark gray to black CLAY with silt, medium to high plasticity, soft with some wood chips, rootlets, moist.	
12			
13			
14			1 ppm HNu 0 ppm OVA
15	CH		≈10% silt 2-2-2
16			Shut down for night to see if water would seep into hole over night; no water standing in augers in morning
17			16 to 20 feet
18			Debris blocked tip of 5-foot sampler, little recovery for 16- to 20-foot sampling interval
19			
20			

Scale: 1 inch = 1.5 feet

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DRILLING LOG

Location	Galbraith Golf Course	Boring No.	MW-GGC5
Driller	Clear Heart Construction	Project No.	S10-112A
Method	Hollow-stem cont. flight	Date	4/23/91
Logger	WKS Datum 19.50 feet Bore size 8-inch	Casing size	None

Depth	Graphic	Lithology	Notes
20	CH		4-foot recovery for 20- to 25-foot sampling interval
21			
22			
23			
24			
25	CH/SC	Greenish gray clayey SAND-sandy CLAY, very fine-grained, medium to high plasticity, caliche nodules, wet.	≈20% silt 5-foot recovery for 25- to 30-foot sampling interval
26		Soft from 24-26.5 feet, becoming firm with increase in clay content.	
27			
28			
29		Becoming stiff at 29 feet.	
30		Total depth = 30.0 feet	

Scale: 1 inch = 1.5 feet

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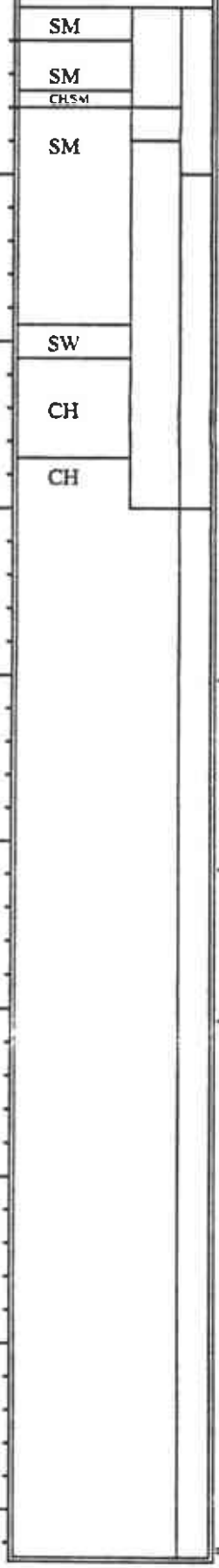

WELL CONSTRUCTION SUMMARY

Project No.: S10-112A Well No: MW-GGC6

Project Name: Galbraith Golf Course
Location: Doolittle Drive, Oakland, CA
Date: 4/24/91
Personnel: WKS
Driller: Clear Heart Construction

DRILLING SUMMARY

Drill Rig: Failing
Auger/Bits: Hollow-stem cont. flight
Drilling Fluid: None
Boring Diameter (inch): 8
Boring Depth (feet): 15
Surface Completion: Stove pipe
Ground Surface Elevation (feet): 14.64 PORT Datum
TOC Elevation (feet): 17.49 PORT Datum

WELL DESIGN

Basis: X Geologic Log ___ Geophysical Log

Casing Diameter (inch)	Material + Length (feet)	Slot Size	Interval (feet bgs)
2	PVC 7.8	Blank	+2.85-5
2	PVC 10.0	10	5-15
Centralizer	None		
Filter Material	Lonestar Sand #2/12		4-15
Bentonite	Pellets		3-4
Cement	Neat		

WATER LEVELS

	Date	Time	Depth (ft bgs)
During Drilling:	4/24/91	13:45	10
After completion:	4/24/91		None
Before development:	5/1/91	13:00	10.38

COMMENTS

CONSTRUCTION TIME LOG

Task	Start Date	Start Time	Finish Date	Finish Time
Drilling:	4/24/91	13:30	4/24/91	14:19
Geophys Logging:				
Casing:	4/24/91	14:23	4/24/91	14:24
Filter Placement:	4/24/91	14:24	4/24/91	14:50
Cementing:	4/24/91	16:15	4/24/91	16:25
Development:	5/1/91	13:00	5/1/91	13:40
Other:				

WELL DEVELOPMENT

Method: Double diaphragm pump Date: 5/1/91

Time	Gallons	Appearance
13:10	5	Very turbid
13:21	10	Turbid
13:34	15	Slightly turbid
13:40	20	Slightly turbid

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[Scale 1 inch=5 feet]

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DRILLING LOG

Location	Galbraith Golf Course	Boring No.	MW-GGC6
Driller	Clear Heart Construction	Project No.	S10-112A
Method	Hollow-stem cont. flight	Date	4/24/91
Logger	WKS Datum 14.64 feet Bore size 8-inch	Casing size	None

Depth	Graphic	Lithology	Notes
0			
	SM	Brown silty SAND, very fine-grained, loose, rootlets, damp.	≈30% silt
1			
	SM	Yellowish brown silty SAND with trace of clay, fine-grained, medium dense, rootlets, damp to very damp.	11-9-10 (blow count)
2			≈20% silt <5% clay 0 ppm HNu and OVA
	CH/SM	Mixture of dark gray to black silty CLAY and yellowish brown silty sand with gravel, medium to high plasticity clay, stiff, fine-grained, rootlets, damp.	6-4-6-5
3			≈25% silt ≈15% gravel
	SM	Becoming predominantly yellowish brown silty sand with gravel, clasts up to ½-inch diameter, hard subangular.	
4			Some brick and concrete pieces
			2-foot recovery for 5- to 10-foot sampling interval
5			
6			
7			
8			
9			Wood pieces at 9.5 feet
10	SW	Very dark gray to bluish gray well-graded SAND with silt and minor gravel, fine-grained with wood pieces, wet.	≈10% silt 0 ppm HNu and OVA

Scale: 1 inch = 1.5 feet

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DRILLING LOG

Location	Galbraith Golf Course	Boring No.	MW-GGC6
Driller	Clear Heart Construction	Project No.	S10-112A
Method	Hollow-stem cont. flight	Date	4/24/91
Logger	WKS Datum 14.64 feet Bore size 8-inch	Casing size	None

Depth	Graphic	Lithology	Notes
10	SW		10-15 feet
11	CH	Dark gray silty CLAY, medium to high plasticity, very soft, laminated, some interbedding of clayey silt (3 inches thick), wet.	≈15% silt No reaction with HCL
12			Sulfuric odor
13			
14	CH	Very dark gray to black silty CLAY, high plasticity, firm, caliche nodules, rootlets, very moist.	Strong reaction with HCL
15		Total depth = 15.0 feet	
16			
17			
18			
19			
20			

Scale: 1 inch = 1.5 feet

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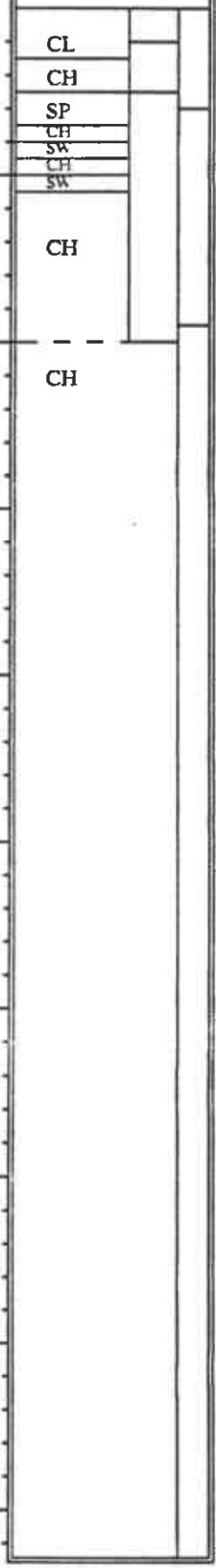

[Scale: 1 inch=5 feet]

WELL CONSTRUCTION SUMMARY

Project No.: S10-112A Well No: MW-GGC7

Project Name: Galbraith Golf Course
Location: 10505 Doolittle Drive
Oakland, CA

Date: 4/24/91
Personnel: WKS
Driller: Clear Heart Construction

DRILLING SUMMARY

Drill Rig: Failing
Auger/Bits: Hollow-stem cont. flight
Drilling Fluid: None
Boring Diameter (inch): 8
Boring Depth (feet): 12.0
Surface Completion: Stove pipe
Ground Surface Elevation (feet): 11.14 PORT Datum
TOC Elevation (feet): 14.97 PORT Datum

WELL DESIGN

Basis: X Geologic Log ___ Geophysical Log

Casing Diameter 20 (inch)	Material + Length (feet)	Slot Size	Interval (feet bgs)
2	PVC 6.8	Blank	+3.83-3
2	PVC 6.8	10	3-9.8
Centralizer None			
Filter Material Lonestar Sand #2/12			2.5-1.0
Bentonite Pellets			1-2.5
Cement Neat			0-1

WATER LEVELS

	Date	Time	Depth (ft bgs)
During Drilling:	4/24/91		None
After completion:	4/24/91		None
Before development:	5/1/91	14:24	8.16

COMMENTS

CONSTRUCTION TIME LOG

Task	Start Date	Start Time	Finish Date	Finish Time
Drilling:	4/24/91	15:20	4/24/91	16:25
Geophys Logging:				
Casing:	4/24/91	16:09	4/24/91	16:33
Filter Placement:	4/24/91	16:39	4/24/91	12:00
Cementing:	4/25/91	16:30	4/25/91	16:30
Development:	5/1/91	14:24	5/2/91	14:35
	5/2/91	11:10	5/2/91	11:44
Other:				

WELL DEVELOPMENT

Method: Double diaphragm pump Date: 5/1-5/2/91

Time	Gallons	Appearance
14:29	0	Turbid
14:35	3	Turbid
11:10	4	Clear
11:21	6	Clear
11:44	7	Clear

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DRILLING LOG

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Location Galbraith Golf Course
Driller Clear Heart Construction
Method Hollow-stem cont. flight
Logger WKS Datum 11.14 feet Bore size 8-inch

Boring No. MW-GGC7
Project No. S10-112A
Date 4/24/91
Casing size None

Depth	Graphic	Lithology	Notes
0	CL	Very dark gray silty CLAY with gravel, low to medium plasticity, firm, rootlets, damp. Gravel clasts up to 2-inch diameter, hard, subangular to angular.	≈15% gravel ≈20% silt No reaction with HCL
1			3-3-5 (blow count)
2	CH	Brown silty CLAY, medium to high plasticity, soft to firm, rootlets, veinlets, moist to very damp.	≈25% silt
3	SP	Gray SAND, fine-grained, loose, rootlets, moist.	0 ppm HNu and OVA 2-2-3-5
4	CH	Brown silty CLAY, moist to very moist.	
	SW	Gravelly SAND, very moist.	
	CH	Very dark gray to black silty CLAY, medium to high plasticity, very soft, rootlets, veinlets, very moist to very moist to wet.	No reaction with HCL
5	SW	Brown, well-graded SAND, wet.	5-foot recovery for 5- to 10-foot sampling interval
6	CH	Gray silty CLAY but predominantly gray, medium to high plasticity, spotted with black organic fragments, very soft, sulfur smell.	
7			
8			
9		Layers of roots and other organic fragments, older Bay mud interbedded with silty clay.	
10			

Scale: 1 inch = 1.5 feet

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DRILLING LOG

Location	Galbraith Golf Course	Boring No.	MW-GGC7
Driller	Clear Heart Construction	Project No.	S10-112A
Method	Hollow-stem cont. flight	Date	4/24/91
Logger	WKS Datum 11.14 feet Bore size 8-inch	Casing size	None

Depth	Graphic	Lithology	Notes
10			3-3-4-5
	CH	Very dark gray CLAY with trace of silt, firm, caliche nodules, rootlets, moist.	≈5% silt 0 ppm HNu
11			Place bentonite pellets from 10-12 feet to seal bottom of boring
12		Total depth = 12.0 feet	
13			
14			
15			
16			
17			
18			
19			
20			

Scale: 1 inch = 1.5 feet

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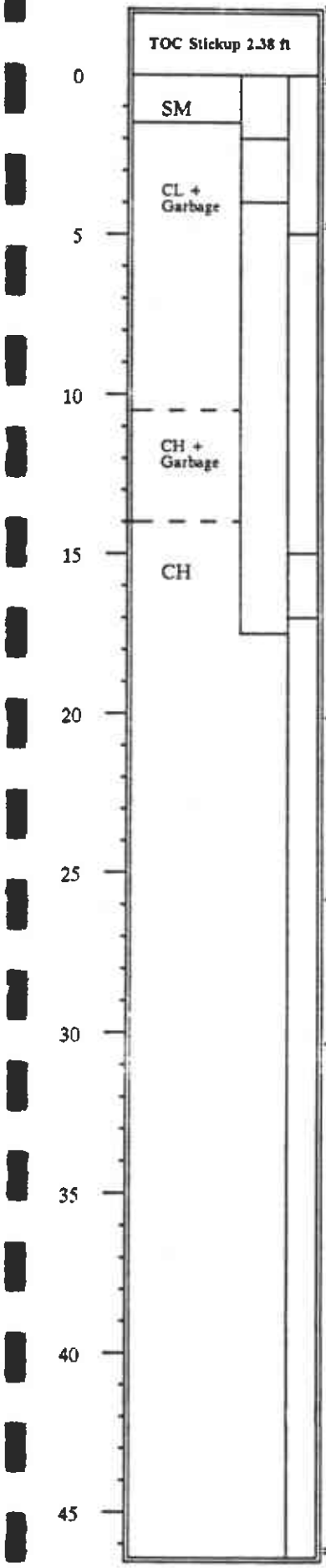

[Scale 1 inch=5 feet]

WELL CONSTRUCTION SUMMARY

Project No.: S10-112A Well No: MW-GGC8

Project Name: Galbraith Golf Course
Location: 10505 Doolittle Drive
Oakland, CA
Date: 4/25/91
Personnel: WKS
Driller: Clear Heart Construction

DRILLING SUMMARY

Drill Rig: Failing
Auger/Bits: Hollow-stem cont. flight
Drilling Fluid: None
Boring Diameter (inch): 8
Boring Depth (feet): 17.5
Surface Completion: Stove pipe
Ground Surface Elevation (feet): 14.31 PORT Datum
TOC Elevation (feet): 16.59 PORT Datum

WELL DESIGN

Basis: X Geologic Log ___ Geophysical Log

Casing Diameter (inch)	Material + Length (feet)	Slot Size	Interval (feet bgs)
2	PVC 7.3	Blank	+2.38-5
2	PVC 10	10	5-15
2	PVC 2	10	15-17

Centralizer	None	
Filter Material	Lonestar Sand #2/12	4-17.5
Bentonite	Pellets	2-4
Cement	Neat	0-2

WATER LEVELS

	Date	Time	Depth (ft bgs)
During Drilling:	4/25/91		None
After completion:	4/25/91		None
Before development:	5/1/91	15:20	14.41

COMMENTS

CONSTRUCTION TIME LOG

Task	Start Date	Start Time	Finish Date	Finish Time
Drilling:	4/25/91	8:30	4/25/91	9:50
Geophys Logging:				
Casing:	4/25/91	12:10	4/25/91	12:12
Filter Placement:	4/25/91	10:15	4/25/91	10:50
Cementing:	4/25/91	16:10	4/25/91	16:15
Development:	5/1/91	15:20	5/1/91	15:52
Other:				

WELL DEVELOPMENT

Method: Double diaphragm pump Date: 5/1/91

Time	Gallons	Appearance
15:23	0	Turbid
15:42	5	Slightly turbid
15:52	7.5	Slightly turbid

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DRILLING LOG

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Location Galbraith Golf Course
Driller Clear Heart Construction
Method Hollow-stem cont. flight
Logger WKS Datum 14.31 feet Bore size 8-inch

Boring No. MW-GGC8
Project No. S10-112A
Date 4/25/91
Casing size None

Depth	Graphic	Lithology	Notes
0			
	SM	Brown silty SAND, very fine-grained, soft, rootlets, damp to dry.	
1			5-7-9 (blow count)
	CL and Garbage	Very dark gray CLAY with sand and gravel, low plasticity, firm to stiff, fine-grained sand, very damp to moist.	≈5% gravel ≈15% sand Some large glass and wood pieces 0 ppm HNu and OVA
2		Gravel up to 1/3-inch diameter.	
3			5-5-6-5
		Increase in garbage debris, increase in sand.	8-inch recovery for 3- to 5-foot sampling interval
4			Wood chips, newspaper blocks, glass
5			
6		Very dark gray to greenish gray silty CLAY, garbage debris in matrix, high plasticity, stiff, moist.	No recovery for 5- to 10-foot sampling interval
7			Large pieces of wood at 7.5 feet; drilled out with pilot bit
8			
9			50 ppm HNu 6 ppm OVA
10			Very stiff drilling Wood chips

Scale: 1 inch = 1.5 feet

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DRILLING LOG

Location	Galbraith Golf Course	Boring No.	MW-GGC8
Driller	Clear Heart Construction	Project No.	S10-112A
Method	Hollow-stem cont. flight	Date	4/25/91
Logger	WKS Datum 14.31 feet Bore size 8-inch	Casing size	None

Depth	Graphic	Lithology	Notes
10	CL		Becoming very soft at 10.5 feet
11	CH and Garbage	Greenish gray silty CLAY, high plasticity, soft to firm, thin interbedding of fine-grained sand (1-2mm in thickness) with stratified silt beds at 12 feet, moist becoming very moist to wet at 13 feet.	6-2-3-3 8-inch recovery for 11- to 13-foot sampling interval
12			Wood pieces in tip of sampler 200 ppm HNu 1 ppm OVA
13			4-6-2-2 8-inch recovery for 13- to 15-foot sampling interval
14	CH	Greenish gray CLAY becoming very soft, wet, (Bay mud).	Large wood pieces in top end of sampler
15			2-1-1-2 4-inch recovery for 15- to 17-foot samping interval
16			
17		Total depth = 17.5 feet	
18			
19			
20			

Scale: 1 inch = 1.5 feet

(6/13/91)

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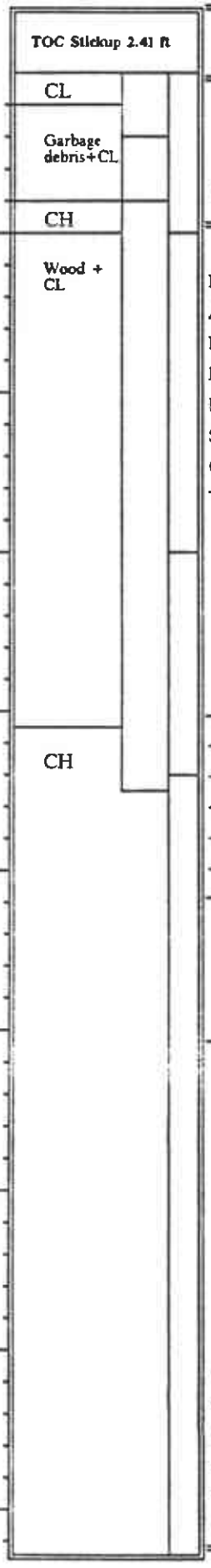
WELL CONSTRUCTION SUMMARY

Project No.: S10-112A Well No: MW-GGC9

Project Name: Galbraith Golf Course
Location: 10505 Doolittle Drive
Oakland, CA

Date: 4/25/91
Personnel: WKS
Driller: Clear Heart Construction



DRILLING SUMMARY

Drill Rig: Failing
Auger/Bits: Hollow-stem cont. flight
Drilling Fluid: None
Boring Diameter (inch): 8
Boring Depth (feet): 22.5
Surface Completion: Stove pipe
Ground Surface Elevation (feet): 17.41 PORT Datum
TOC Elevation (feet): 19.82 PORT Datum

WELL DESIGN

Basis: X Geologic Log ___ Geophysical Log

Casing Diameter (inch)	Material + Length (feet)	Slot Size	Interval (feet bgs)
2	PVC 7.4	Blank	+2.41-5
2	PVC 10.0	0.010	5-15
2	PVC 7.0	0.010	15-22

Centralizer	None	
Filter Material	Lonestar Sand #2/12	4-22.5
Bentonite	Pellets	2-4
Cement	Neat	15-22

WATER LEVELS

	Date	Time	Depth (ft bgs)
During Drilling:	4/25/91	14:10	≈17.5
After completion:	4/25/91		None
Before development:	5/1/91	16:30	17.82

COMMENTS

CONSTRUCTION TIME LOG

Task	Start		Finish	
	Date	Time	Date	Time
Drilling:	4/25/91	11:58	4/25/91	15:27
Geophys Logging:				
Casing:	4/25/91	15:33	4/25/91	15:35
Filter Placement:				
Cementing:	4/25/91	15:40	4/25/91	15:58
Development:	5/1/91	10:09	5/1/91	12:39
Other:				

WELL DEVELOPMENT

Method: Double diaphragm pump Date: 5/1 and 5/2/91

Time	Gallons	Appearance
10:09	2.5	Very turbid
12:18	3	Turbid
12:39	4	Slightly turbid

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[Scale: 1 inch=5 feet]

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DRILLING LOG

Location Galbraith Golf Course
Driller Clear Heart Construction
Method Hollow-stem cont. flight
Logger WKS Datum 17.41 feet Bore size 8-inch

Boring No. MW-GGC9
Project No. S10-112A
Date 4/25/91
Casing size None

Depth	Graphic	Lithology	Notes
0			
	CL	Brown silty CLAY with sand, low plasticitiy, firm, rootlets, damp.	
1			5-5-5 (blow count)
	Garbage debris and CL	Increase in wood debris, becomes very soft.	Large wood piece, some plastic and glass
2			
3			2-3-4-3
4	CH	Dark greenish gray silty CLAY, minor gravel and shells, high plasticity, firm, moist.	Strong reaction with HCL
5	Wood and CL	Dark greenish gray and gray silty CLAY, medium plasticity, stiff to very stiff, wood pieces, moist.	100 ppm HNu 900 ppm OVA (Sample in auger)
6			3-8-9-8
7		Predominantly wood pieces.	No recovery except tip for VOA readings
			Sample of cloth only recovery
8			30 ppm VOA 200 ppm HNu
9			
10			

Scale: 1 inch = 1.5 feet

(6/13/91)

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DRILLING LOG

Location	Galbraith Golf Course	Boring No.	MW-GGC9
Driller	Clear Heart Construction	Project No.	S10-112A
Method	Hollow-stem cont. flight	Date	4/25/91
Logger	WKS Datum 17.41 feet Bore size 8-inch	Casing size	None

Depth	Graphic	Lithology	Notes
10	Wood and CL	Dark greenish gray and gray silty CLAY, medium plasticity, stiff to very stiff, wood pieces, moist.	1.5 feet recovery for 10- to 15-foot sampling interval
11			Pieces of rubber, papers, wire, lots of wood, cardboard, brick, and glass at 10-14 feet
12			Rancid odor
13			
14		Increase in matrix of clayey SAND (≈20%), becoming black in color, moist.	
15			
16			3-4-5-24
17			Hit wood at 17.5-19 feet
18			Very hard drilling to 19 feet
19			
20			

Scale: 1 inch = 1.5 feet

(6/13/91)

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DRILLING LOG

Location	Galbraith Golf Course	Boring No.	MW-GGC9
Driller	Clear Heart Construction	Project No.	S10-112A
Method	Hollow-stem cont. flight	Date	4/25/91
Logger	WKS Datum 17.41 feet Bore size 8-inch	Casing size	None

Depth	Graphic	Lithology	Notes
20			3-3-4-8
21	CH	Light gray CLAY with sand and silt, medium to high plasticity, firm to stiff, fine-grained, moist.	≈15% silt ≈20% sand
22		Total depth = 22.5 feet	
23			
24			
25			
26			
27			
28			
29			
30			

Scale: 1 inch = 1.5 feet

(6/13/91)

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APPENDIX B

WELL DEVELOPMENT AND GROUNDWATER SAMPLING FORMS

GROUNDWATER SAMPLING

Project No: S10112-A0
Project Name: GALBRAITH GOLF COURSE
Location: 10505 Doolittle Road

Recorded by: WKS
Weather Conditions: Sunny, slight breeze
Precip. in last 5 days (inch): None

Well No.: MW-GGC1 Date: 5/06/91
Depth of Well from TOC (feet): 22.3
Well Diameter (inch): 2
Screened Interval (feet): 5-20
TOC Elevation (feet): 14.08 PORT Datum
Water Level from TOC (feet): 6.65 Time: 10:27
Product Level from TOC (feet): None Time: 10:27
Water Level Measurement (feet): 7.43 PORT Datum

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(22.3 ft) − (6.65 ft)] x (.083 ft)^2 x 3.14 x 7.48 =
Well Depth − Water Level × Well radius

2.5 gallons on one well volume.
12.5 gallons in 5 well volumes.
12.5 total gallons removed.

CALIBRATION:

	Time	Temp (°C)	pH	EC
Calibration Standard:	10:38	19	7.00	10,000
Before Purging:	10:39	19	7.00	9,000
After Purging:	16:45	23	7.02	9,000

FIELD MEASUREMENTS:

Time	Temp (°C)	pH	EC	Cumulative Gallons Removed	Appearance
10:42	18	7.45	850	3	Very slightly turbid to clear
11:04	19	7.45	800	6	Clear
11:30	20	7.42	800	9	Clear
11:43	17	7.44	775	12.5	Clear

Water Level After Purging Prior to Sampling (feet): 6.83 Time: 11:50
Appearance of Sample: Clear Time: 12:00
Duplicate/Blank No.: Travel blank Time: 08:00
Purge Method: Double diaphragm pump
Sampling Equipment: Disposable PVC bailer VOC Attachment: Yes
Sample Containers: 1 liter amber glass, 1 liter plastic, 75 ml plastic, 50 ml plastic, four (4) 40 ml VOAs
Sample Analyses: 608, CL, TDS, Title 26, Nitrate, 8010, 8020 Laboratory: Curtis and Tompkins
Decontamination Method: TSP and water, DI water rinse Rinsate Disposal: MW-GGC1 W5

(3/18/91)

GROUNDWATER SAMPLING

Project No: S10112-A0
Project Name: GALBRAITH GOLF COURSE
Location: 10505 Doolittle Road

Recorded by: WKS
Weather Conditions: Sunny, slight breeze
Precip. in last 5 days (inch): None

Well No.: MW-GGC2 **Date:** 5/06/91
Depth of Well from TOC (feet): 22.5
Well Diameter (inch): 2
Screened Interval (feet): 5-20
TOC Elevation (feet): 10.37 PORT Datum
Water Level from TOC (feet): 5.70 Time: 12:19
Product Level from TOC (feet): None Time: 12:19
Water Level Measurement (feet): 4.67 PORT Datum

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(22.5 ft) – (5.7 ft)] x (.083 ft)² x 3.14 x 7.48 =
Well Depth – Water Level – Well radius

2.7 gallons on one well volume.
13.5 gallons in 5 well volumes.
13.5 total gallons removed.

CALIBRATION:

	Time	Temp (°C)	pH	EC
Calibration Standard:	10:38	19	7.00	10,000
Before Purging:	10:39	19	7.00	9,000
After Purging:	16:45	23	7.02	9,000

FIELD MEASUREMENTS:

Time	Temp (°C)	pH	EC	Cumulative Gallons Removed	Appearance
12:30	23.0	7.30	800	2.5	Very slightly turbid to clear
12:49	20.0	7.24	900	5.5	Clear
13:02	22.0	7.24	875	8.0	Clear
13:14	21.0	7.29	900	13.5	Clear

Water Level After Purging Prior to Sampling (feet): 6.02 Time: 13:25
Appearance of Sample: Clear Time: 13:30
Duplicate/Blank No.: Travel blank Time: 08:00
Purge Method: Double diaphragm pump
Sampling Equipment: Disposable PVC bailer VOC Attachment: Yes
Sample Containers: 1 liter amber glass, 1 liter plastic, 75 ml plastic, 50 ml plastic, four (4) 40 ml VOAs
Sample Analyses: 608, CL, TDS, Title 26, Nitrate, 8010, 8020 Laboratory: Curtis and Tompkins
Decontamination Method: TSP and water, DI water rinse Rinsate Disposal: MW-GGC2,3 W6

(3/18/91)

GROUNDWATER SAMPLING

Project No: S10112-A0
Project Name: GALBRAITH GOLF COURSE
Location: 10505 Doolittle Road

Recorded by: WKS
Weather Conditions: Sunny, breezy
Precip. in last 5 days (inch): None

Well No.: MW-GGC3 **Date:** 5/06/91
Depth of Well from TOC (feet): 22.85
Well Diameter (inch): 2
Screened Interval (feet): 5-20
TOC Elevation (feet): 10.94 PORT Datum
Water Level from TOC (feet): 4.64 Time: 13:48
Product Level from TOC (feet): None Time: 13:48
Water Level Measurement (feet): 6.30 PORT Datum

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(22.85 ft) − (4.64 ft)] x (.083 ft)² x 3.14 x 7.48 =
Well Depth − Water Level; Well radius

3 gallons on one well volume.
15 gallons in 5 well volumes.
15 total gallons removed.

CALIBRATION:

	Time	Temp (°C)	pH	EC
Calibration Standard:	10:38	19	7.00	10,000
Before Purging:	10:39	19	7.00	9,000
After Purging:	16:45	23	7.02	9,000

FIELD MEASUREMENTS:

Time	Temp (°C)	pH	EC	Cumulative Gallons Removed	Appearance
14:05	20.0	7.16	10,000	2.5	Very slightly turbid
14:26	19.5	7.13	10,000	7.0	Clear
14:44	20.0	7.12	10,000	11.0	Clear
15:03	19.5	7.15	10,000	15.0	Clear

Water Level After Purging Prior to Sampling (feet): 5.56 Time: 15:09
Appearance of Sample: Clear Time: 15:15
Duplicate/Blank No.: Travel blank Time: 08:00, 5/06/91
Purge Method: Double diaphragm pump
Sampling Equipment: Disposable PVC bailer VOC Attachment: Yes
Sample Containers: 1 liter amber glass, 1 liter plastic, 75 ml plastic, 50 ml plastic, four (4) 40 ml VOAs
Sample Analyses: 608, CL, TDS, Title 26, Nitrate, 8010, 8020 Laboratory: Curtis and Tompkins
Decontamination Method: TSP and water, DI water rinse Rinsate Disposal: MW-GGC3,4,5,6 W7

(3/18/91)

GROUNDWATER SAMPLING

Project No: S10112-A0
Project Name: GALBRAITH GOLF COURSE
Location: 10505 Doolittle Road

Recorded by: WKS
Weather Conditions: Sunny, breezy
Precip. in last 5 days (inch): None

Well No.: MW-GGC4 **Date:** 5/07/91
Depth of Well from TOC (feet): 18.35
Well Diameter (inch): 2
Screened Interval (feet): 4.7-15.7
TOC Elevation (feet): 17.10 PORT Datum
Water Level from TOC (feet): 9.39 Time: 11:55
Product Level from TOC (feet): None Time: 11:55
Water Level Measurement (feet): 7.71 PORT Datum

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(18.35 ft) − (9.39 ft)] x (.083 ft)² x 3.14 x 7.48 =
Well Depth − Water Level × Well radius

1.5 gallons on one well volume.
7.5 gallons in 5 well volumes.
7.5 total gallons removed.

CALIBRATION:

	Time	Temp (°C)	pH	EC
Calibration Standard:	10:38	19	7.00	10,000
Before Purging:	10:39	19	7.00	9,000
After Purging:	16:45	23	7.02	9,000

FIELD MEASUREMENTS:

Time	Temp (°C)	pH	EC	Cumulative Gallons Removed	Appearance
12:05	25.0	6.96	12,500	1.5	Very slightly turbid
12:10	25.0	6.97	12,500	3.5	Very slightly turbid
12:15	25.0	6.99	12,000	5	Very slightly turbid
12:23	25.0	7.02	12,000	7.5	Very slightly turbid

Water Level After Purging Prior to Sampling (feet): 9.4 Time: 12:25
Appearance of Sample: Very slightly turbid Time: 12:30
Duplicate/Blank No.: Travel blank Time: 08:00
Purge Method: Double diaphragm pump
Sampling Equipment: Disposable PVC bailer VOC Attachment: Yes
Sample Containers: 1 liter amber glass, 1 liter plastic, 75 ml plastic, 50 ml plastic, four (4) 40 ml VOAs
Sample Analyses: 608, CL, TDS, Title 26, Nitrate, 8010, 8020 Laboratory: Curtis and Tompkins
Decontamination Method: TSP and water, DI water rinse Rinsate Disposal: MW-GGC3,4,5,6 W7

(3/18/91)

GROUNDWATER SAMPLING

Project No: S10112-A0
Project Name: GALBRAITH GOLF COURSE
Location: 10505 Doolittle Road

Recorded by: WKS
Weather Conditions: Partly cloudy
Precip. in last 5 days (inch): None

Well No.: MW-GGC5 Date: 5/07/91
Depth of Well from TOC (feet): 32.5
Well Diameter (inch): 2
Screened Interval (feet): 24-30
TOC Elevation (feet): 22.07 PORT Datum
14.59 16:44, 5/06/91
Water Level from TOC (feet): 14.58 Time: 08:06
Product Level from TOC (feet): None Time: 08:07
Water Level Measurement (feet): 7.49 PORT Datum

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(32.5 ft) – (14.58 ft)] x (.083 ft)² x 3.14 x 7.48 =
Well Depth – Water Level – Well radius

2.9 gallons on one well volume.
14.5 gallons in 5 well volumes.
15 total gallons removed.

CALIBRATION:

	Time	Temp (°C)	pH	EC
Calibration Standard:	08:16	16	7.00	10,000
Before Purging:	08:17	16	7.00	10,000
After Purging:	15:10	24	7.02	11,000

FIELD MEASUREMENTS:

Time	Temp (°C)	pH	EC	Cumulative Gallons Removed	Appearance
08:26	19	6.51	>50,000	1	Very slightly turbid
08:42	21	6.51	>50,000	5	Very slightly turbid
08:58	22	6.48	>50,000	11	Clear
09:15	21	6.50	>50,000	15	Clear

Water Level After Purging Prior to Sampling (feet): 19.89 Time: 09:28
Appearance of Sample: Clear Time: 09:30
Duplicate/Blank No.: Travel blank Time: 08:00
Purge Method: Double diaphragm pump
Sampling Equipment: Disposable PVC bailer VOC Attachment: Yes
Sample Containers: 1 liter amber glass, 1 liter plastic, 75 ml plastic, 50 ml plastic, four (4) 40 ml VOAs
Sample Analyses: 608, CL, TDS, Title 26, Nitrate, 8010, 8020 Laboratory: Curtis and Tompkins
Decontamination Method: TSP and water, DI water rinse Rinsate Disposal: MW-GGC3,4,5,6 W7

(3/18/91)

GROUNDWATER SAMPLING

Project No: S10112-A0
Project Name: GALBRAITH GOLF COURSE
Location: 10505 Doolittle Road

Recorded by: WKS
Weather Conditions: Sunny, breezy
Precip. in last 5 days (inch): None

Well No.: MW-GGC6 **Date:** 5/06/91
Depth of Well from TOC (feet): 17.5
Well Diameter (inch): 2
Screened Interval (feet): 5-15
TOC Elevation (feet): 17.49 PORT Datum
Water Level from TOC (feet): 10.42 Time: 15:36
Product Level from TOC (feet): None Time: 15:40
Water Level Measurement (feet): 7.07 PORT Datum

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(17.5 ft) − (10.42 ft)] x (.083 ft)^2 x 3.14 x 7.48 =
Well Depth Water Level Well radius

1.2 gallons on one well volume.
6 gallons in 5 well volumes.
6 total gallons removed.

CALIBRATION:

	Time	Temp (°C)	pH	EC
Calibration Standard:	10:38	19	7.00	10,000
Before Purging:	10:39	19	7.00	9,000
After Purging:	16:45	23	7.02	9,000

FIELD MEASUREMENTS:

Time	Temp (°C)	pH	EC	Cumulative Gallons Removed	Appearance
15:51	19.0	6.97	20,000	1	Slightly turbid
16:00	18.5	7.11	14,000	2	Very slightly turbid
16:14	18.0	7.12	14,000	4	Clear
16:22	18.0	7.09	13,500	6	Clear

Water Level After Purging Prior to Sampling (feet): 10.46 Time: 16:25
Appearance of Sample: Clear Time: 16:35
Duplicate/Blank No.: Travel blank Time: 08:00
Purge Method: Double diaphragm pump
Sampling Equipment: Disposable PVC bailer VOC Attachment: Yes
Sample Containers: 1 liter amber glass, 1 liter plastic, 75 ml plastic, 50 ml plastic, four (4) 40 ml VOAs
Sample Analyses: 608, CL, TDS, Title 26, Nitrate, 8010, 8020 Laboratory: Curtis and Tompkins
Decontamination Method: TSP and water, DI water rinse Rinsate Disposal: MW-GGC3,4,5,6 W7

(3/18/91)

GROUNDWATER SAMPLING

Project No: S10112-A0
Project Name: GALBRAITH GOLF COURSE
Location: 10505 Doolittle Road

Recorded by: WKS
Weather Conditions: Sunny, breezy
Precip. in last 5 days (inch): None

Well No.: MW-GGC7 **Date:** 5/07/91
Depth of Well from TOC (feet): 13.7
Well Diameter (inch): 2
Screened Interval (feet): 3-9.8
TOC Elevation (feet): 14.97 PORT Datum
Water Level from TOC (feet): 8.39 Time: 09:54
Product Level from TOC (feet): None Time: 09:55
Water Level Measurement (feet): 6.58 PORT Datum

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(13.7 ft) – (8.39 ft)] x (.083 ft)² x 3.14 x 7.48 =
Well Depth – Water Level; Well radius

.87 gallons on one well volume.
4.4 gallons in 5 well volumes.
5 total gallons removed.

CALIBRATION:

	Time	Temp (°C)	pH	EC
Calibration Standard:	08:16	16	7.00	10,000
Before Purging:	08:16	16	7.00	10,000
After Purging:	15:10	24	7.02	11,000

FIELD MEASUREMENTS:

Time	Temp (°C)	pH	EC	Cumulative Gallons Removed	Appearance
10:02	18.5	6.51	33,000	1	Clear
10:13	17.0	6.44	30,000	2	Clear
10:24	17.0	6.43	30,000	3	Clear
10:35	16.5	6.45	31,000	4	Clear
10:45	16.5	6.42	31,000	5	Very slightly turbid

Water Level After Purging Prior to Sampling (feet): 12.45 Time: 13:25
Appearance of Sample: Clear Time: 13:30
Duplicate/Blank No.: Travel blank Time: 08:00
Purge Method: Double diaphragm pump
Sampling Equipment: Disposable PVC bailer VOC Attachment: Yes
Sample Containers: 1 liter amber glass, 1 liter plastic, 75 ml plastic, 50 ml plastic, four (4) 40 ml VOAs
Sample Analyses: 608, CL, TDS, Title 26, Nitrate, 8010, 8020 Laboratory: Curtis and Tompkins
Decontamination Method: TSP and water, DI water rinse Rinsate Disposal: MW-GGC7,8,9 W7

(3/18/91)

GROUNDWATER SAMPLING

Project No: S10112-A0
Project Name: GALBRAITH GOLF COURSE
Location: 10505 Doolittle Road

Recorded by: WKS
Weather Conditions: Sunny, breezy
Precip. in last 5 days (inch): None

Well No.: MW-GGC8 Date: 5/07/91
Depth of Well from TOC (feet): 19.5
Well Diameter (inch): 2
Screened Interval (feet): 5-17
TOC Elevation (feet): 16.59 PORT Datum
Water Level from TOC (feet): 14.43 Time: 11:02
Product Level from TOC (feet): None Time: 11:03
Water Level Measurement (feet): 2.16 PORT Datum

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(19.5 ft) − (14.43 ft)] x (.083 ft)² x 3.14 x 7.48 =
Well Depth − Water Level; Well radius

0.83 gallons on one well volume.
4.2 gallons in 5 well volumes.
4.5 total gallons removed.

CALIBRATION:

	Time	Temp (°C)	pH	EC
Calibration Standard:	10:38	19	7.00	10,000
Before Purging:	10:39	19	7.00	9,000
After Purging:	16:45	23	7.02	9,000

FIELD MEASUREMENTS:

Time	Temp (°C)	pH	EC	Cumulative Gallons Removed	Appearance
11:10	23.0	6.48	16,500	1.5	Very slightly turbid
11:15	24.0	6.49	17,000	3.5	Very slightly turbid
11:18	24.0	6.49	17,000	4.5	Very slightly turbid

Water Level After Purging Prior to Sampling (feet): 14.45 Time: 11:31
Appearance of Sample: Very slightly turbid Time: 11:45
Duplicate/Blank No.: Travel blank Time: 08:00
Purge Method: Double diaphragm pump
Sampling Equipment: Disposable PVC bailer VOC Attachment: Yes
Sample Containers: 1 liter amber glass, 1 liter plastic, 75 ml plastic, 50 ml plastic, four (4) 40 ml VOAs
Sample Analyses: 608, CL, TDS, Title 26, Nitrate, 8010, 8020 Laboratory: Curtis and Tompkins
Decontamination Method: TSP and water, DI water rinse Rinsate Disposal: MW-GGC7,8,9 W7

(3/18/91)

GROUNDWATER SAMPLING

Project No: S10112-A0
Project Name: GALBRAITH GOLF COURSE
Location: 10505 Doolittle Road

Recorded by: WKS
Weather Conditions: Sunny, breezy
Precip. in last 5 days (inch): None

Well No.: MW-GGC9 **Date:** 5/07/91
Depth of Well from TOC (feet): 24.5
Well Diameter (inch): 2
Screened Interval (feet): 5-22
TOC Elevation (feet): 19.82 PORT Datum
Water Level from TOC (feet): 17.83 Time: 12:49
Product Level from TOC (feet): None Time: 12:49
Water Level Measurement (feet): 1.99 PORT Datum

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(24.5 ft) − (17.83 ft)] x (.083 ft)² x 3.14 x 7.48 =
Well Depth − Water Level; Well radius

1.1 gallons on one well volume.
5.5 gallons in 5 well volumes.
6 total gallons removed.

CALIBRATION:

	Time	Temp (°C)	pH	EC
Calibration Standard:	08:16	16	7.00	10,000
Before Purging:	08:16	16	7.00	10,000
After Purging:	15:10	24	7.02	11,000

FIELD MEASUREMENTS:

Time	Temp (°C)	pH	EC	Cumulative Gallons Removed	Appearance
12:58	25.0	6.61	10,000	1	Turbid
13:10	25.0	6.74	11,000	3	Slightly turbid
13:19	25.0	6.76	11,000	6	Slightly turbid

Water Level After Purging Prior to Sampling (feet): 17.84 Time: 14:50
Appearance of Sample: Slightly turbid turning turbid Time: 14:55
Duplicate/Blank No.: Travel blank Time: 08:00, 5/07/91
Purge Method: Double diaphragm pump
Sampling Equipment: Disposable PVC bailer VOC Attachment: Yes
Sample Containers: 1 liter amber glass, 1 liter plastic, 75 ml plastic, 50 ml plastic, four (4) 40 ml VOAs
Sample Analyses: 608, CL, TDS, Title 26, Nitrate, 8010, 8020 Laboratory: Curtis and Tompkins
Decontamination Method: TSP and water, DI water rinse Rinsate Disposal: MW-GGC7,8,9 W7

(3/18/91)

WELL DEVELOPMENT

Project No: S10112-A0

Project Name: GALBRAITH GOLF COURSE

Location: 10505 Doolittle Road

Recorded by: WKS

Weather Conditions: Breezy, partly cloudy

Precip. in last 5 days (inch): 0.1

Well No.: MW-GGC1 Date: 4/30/91

Depth of Well from TOC (feet): 22.3

Well Diameter (inch): 2

Screened Interval (feet): 5-20

TOC Elevation (feet): 14.08 PORT Datum

Water Level from TOC (feet): 6.46 Time: 09:33

Product Level from TOC (feet): None Time: 09:33

Water Level Measurement (feet): 7.62 PORT Datum

FIELD MEASUREMENTS

Time	Gallons Removed	Appearance
09:54	3	Very turbid
10:09	7	Clear
10:25	12	Clear

Recharge:

Time	Water Level (feet)
10:27:58	7.4
10:28:10	7.3
10:28:42	7.1
10:29:23	7.0
10:30:22	6.9
10:32:20	6.8

Total Gallons Removed: 12

Development Method: Double diaphragm pump

Decontamination Method: TSP wash DI rinse

Average Recharge Rate (foot/minute): 0.14

Purged Water Disposal: MW-GGC1 W5

Number of Drums: MW-GGC1 W5

Rinsate Disposal: MW-GGC1 W5

(3/18/91)

WELL DEVELOPMENT

Project No: S10112-A0

Project Name: GALBRAITH GOLF COURSE

Location: 10505 Doolittle Road

Recorded by: WKS

Weather Conditions: Breezy, partly cloudy

Precip. in last 5 days (inch): 0.1

Well No.: MW-GGC2 **Date:** 4/30/91

Depth of Well from TOC (feet): 22.5

Well Diameter (inch): 2

Screened Interval (feet): 5-20

TOC Elevation (feet): 10.37 PORT Datum

Water Level from TOC (feet): 5.68 Time: 10:58

Product Level from TOC (feet): None Time: 10:58

Water Level Measurement (feet): 4.69 PORT Datum

FIELD MEASUREMENTS

Time	Gallons Removed	Appearance
11:12	2.5	Turbid
11:27	7.5	Very turbid (purged block)
11:44	12.5	Slightly turbid
11:58	17.5	Very slightly turbid
12:14	22.5	Very slightly turbid
12:28	27.5	Very slightly turbid
(continued development - increase Q rate to purge full well volume)		
14:51	27.5	Turbid
15:05	32.5	Very slightly turbid
15:35	41.0	Very slightly turbid

Recharge:

Time	Water Level (feet)
12:34:00	9.9
12:34:34	9.6
12:34:56	9.4
12:35:21	9.2
12:36:11	8.0
12:36:35	7.3
12:37:14	7.0
12:37:52	6.8
12:38:54	6.6

Total Gallons Removed: 41

Development Method: Double diaphragm pump

Decontamination Method: TSP wash DI rinse

Average Recharge Rate (foot/minute): 0.67

Purged Water Disposal: MW-GGC2,3 W6

Number of Drums: MW-GGC2,3 W6

Rinsate Disposal: MW-GGC2,3 W6

(3/18/91)

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 103639-8
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-00
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC8

DATE RECEIVED: 04/26/91
DATE ANALYZED: 04/30,05/03/91
DATE REPORTED: 05/06/91

Title 26 Metals in Soils & Wastes
Digestion Method: EPA 3050

METAL	RESULT mg/Kg	REPORTING LIMIT mg/Kg	METHOD
Antimony	ND	3.0	EPA 6010
Arsenic	5.7	2.5	EPA 7060
Barium	225	0.25	EPA 6010
Beryllium	0.62	0.10	EPA 6010
Cadmium	3.1	0.25	EPA 6010
Chromium (total)	48.2	0.50	EPA 6010
Cobalt	14.3	0.90	EPA 6010
Copper	77.8	0.50	EPA 6010
Lead	115	3.5	EPA 6010
Mercury	0.30	0.09	EPA 7471
Molybdenum	ND	0.70	EPA 6010
Nickel	46.1	1.6	EPA 6010
Selenium	ND	3.5	EPA 6010
Silver	ND	0.50	EPA 6010
Thallium	ND	6.3	EPA 6010
Vanadium	49.8	0.50	EPA 6010
Zinc	176	0.50	EPA 6010

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Antimony	1	91	Mercury	5	91
Arsenic	3	88	Molybdenum	3	91
Barium	2	93	Nickel	<1	91
Beryllium	<1	96	Selenium	<1	91
Cadmium	4	92	Silver	4	100
Chromium	4	96	Thallium	10	84
Cobalt	1	87	Vanadium	3	91
Copper	<1	96	Zinc	4	92
Lead	5	88			

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103639-9
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-00
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC9

DATE RECEIVED: 04/26/91
DATE ANALYZED: 04/30,05/03/91
DATE REPORTED: 05/06/91

Title 26 Metals in Soils & Wastes
Digestion Method: EPA 3050

METAL	RESULT mg/Kg	REPORTING LIMIT mg/Kg	METHOD
Antimony	ND	3.0	EPA 6010
Arsenic	3.2	2.4	EPA 7060
Barium	204	0.25	EPA 6010
Beryllium	0.43	0.10	EPA 6010
Cadmium	3.6	0.25	EPA 6010
Chromium (total)	44.5	0.50	EPA 6010
Cobalt	13.8	0.90	EPA 6010
Copper	61.7	0.50	EPA 6010
Lead	307	3.5	EPA 6010
Mercury	0.14	0.09	EPA 7471
Molybdenum	ND	0.70	EPA 6010
Nickel	52.2	1.6	EPA 6010
Selenium	ND	3.5	EPA 6010
Silver	ND	0.50	EPA 6010
Thallium	ND	6.3	EPA 6010
Vanadium	43.1	0.50	EPA 6010
Zinc	263	0.50	EPA 6010

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Antimony	1	91	Mercury	5	91
Arsenic	3	88	Molybdenum	3	91
Barium	2	93	Nickel	<1	91
Beryllium	<1	96	Selenium	<1	91
Cadmium	4	92	Silver	4	100
Chromium	4	96	Thallium	10	84
Cobalt	1	87	Vanadium	3	91
Copper	<1	96	Zinc	4	92
Lead	5	88			

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 05/07/91
DATE REPORTED: 05/28/91

LAB NUMBER: 103736

CLIENT: BASELINE ENVIRONMENTAL

PROJECT ID: S10112-AO

LOCATION: GALBRAITH GOLF COURSE

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

WELL DEVELOPMENT

Project No: S10112-A0

Project Name: GALBRAITH GOLF COURSE

Location: 10505 Doolittle Road

Recorded by: WKS

Weather Conditions: Breezy, partly cloudy

Precip. in last 5 days (inch): 0.1

Well No.: MW-GGC3 **Date:** 4/30/91

Depth of Well from TOC (feet): 22.85

Well Diameter (inch): 2

Screened Interval (feet): 5-20

TOC Elevation (feet): 10.94 PORT Datum

Water Level from TOC (feet): 4.55 Time: 12:51

Product Level from TOC (feet): None Time: 12:51

Water Level Measurement (feet): 6.39 PORT Datum

FIELD MEASUREMENTS

Time	Gallons Removed	Appearance
12:58	5	Very turbid
13:06	9.5	Turbid becoming v. sl. turbid
13:17	14.0	Very slightly turbid
13:25	18.5	Very slightly turbid
13:40	23.0	Very slightly turbid

Recharge:

Time	Water Level (feet)
02:00:38	7.9
02:00:57	7.8
02:01:43	7.6
02:02:19	7.4
02:03:04	7.2
02:04:02	6.0
02:05:27	5.8
02:07:23	5.6
02:10:10	5.4
02:14:43	5.2
02:21:39	5.0

Total Gallons Removed: 23

Development Method: Double diaphragm pump

Decontamination Method: TSP wash DI rinse

Average Recharge Rate (foot/minute): 0.13

Purged Water Disposal: MW-GGC2,3 W6

Number of Drums: MW-GGC2,3 W6

Rinsate Disposal: MW-GGC2,3 W6

(3/18/91)

WELL DEVELOPMENT

Project No: S10112-A0

Project Name: GALBRAITH GOLF COURSE

Location: 10505 Doolittle Road

Recorded by: WKS

Weather Conditions: Breezy, partly cloudy

Precip. in last 5 days (inch): 0.1

Well No.: MW-GGC3 **Date:** 4/30/91

Depth of Well from TOC (feet): 22.85

Well Diameter (inch): 2

Screened Interval (feet): 5-20

TOC Elevation (feet): 10.94 PORT Datum

Water Level from TOC (feet): 4.55 Time: 12:51

Product Level from TOC (feet): None Time: 12:51

Water Level Measurement (feet): 6.39 PORT Datum

FIELD MEASUREMENTS

Time	Gallons Removed	Appearance
12:58	5	Very turbid
13:06	9.5	Turbid becoming v. sl. turbid
13:17	14.0	Very slightly turbid
13:25	18.5	Very slightly turbid
13:40	23.0	Very slightly turbid

Recharge:

Time	Water Level (feet)
02:00:38	7.9
02:00:57	7.8
02:01:43	7.6
02:02:19	7.4
02:03:04	7.2
02:04:02	6.0
02:05:27	5.8
02:07:23	5.6
02:10:10	5.4
02:14:43	5.2
02:21:39	5.0

Total Gallons Removed: 23

Development Method: Double diaphragm pump

Decontamination Method: TSP wash DI rinse

Average Recharge Rate (foot/minute): 0.13

Purged Water Disposal: MW-GGC2,3 W6

Number of Drums: MW-GGC2,3 W6

Rinsate Disposal: MW-GGC2,3 W6

(3/18/91)

WELL DEVELOPMENT

Project No: S10112-A0

Project Name: GALBRAITH GOLF COURSE

Location: 10505 Doolittle Road

Recorded by: WKS

Weather Conditions: Showers, breezy

Precip. in last 5 days (inch): 0.1

Well No.: MW-GGC4 **Date:** 5/01/91

Depth of Well from TOC (feet): 18.35

Well Diameter (inch): 2

Screened Interval (feet): 4.7-15.7

TOC Elevation (feet): 17.10 PORT Datum

Water Level from TOC (feet): 9.35 Time: 09:40

Product Level from TOC (feet): None Time: 09:40

Water Level Measurement (feet): 7.75 PORT Datum

FIELD MEASUREMENTS

Time	Gallons Removed	Appearance
09:43	4.5	Very turbid
09:53	9	Very slightly turbid
10:04	13.5	Very slightly turbid
10:10	18.0	Very slightly turbid

Recharge:

Time	Water Level (feet)

(Recharge rate too fast to measure; increased Q from 10:04 - 10:10)

Total Gallons Removed: 18

Development Method: Double diaphragm pump

Decontamination Method: TSP wash DI rinse

Average Recharge Rate (foot/minute): >4.0

Purged Water Disposal: MW-GGC3,4,5,6 W7

Number of Drums: MW-GGC3,4,5,6 W7

Rinsate Disposal: MW-GGC3,4,5,6 W7

(3/18/91)

WELL DEVELOPMENT

Project No: S10112-A0

Project Name: GALBRAITH GOLF COURSE

Location: 10505 Doolittle Road

Recorded by: WKS

Weather Conditions: Showers, breezy

Precip. in last 5 days (inch): 0.1

Well No.: MW-GGC5 **Date:** 5/01/91

Depth of Well from TOC (feet): 32.5

Well Diameter (inch): 2

Screened Interval (feet): 24-30

TOC Elevation (feet): 22.07 PORT Datum

Water Level from TOC (feet): 14.52 Time: 10:47

Product Level from TOC (feet): None Time: 10:47

Water Level Measurement (feet): 7.55 PORT Datum

FIELD MEASUREMENTS

Time	Gallons Removed	Appearance
11:22	5	Turbid
11:48	9.5	Slightly turbid
12:16	13.0	Very slightly turbid

Recharge:

Time	Water Level (feet)
12:14:35	30
12:15:29	29.9
12:16:12	29.8
12:17:00	29.7
12:17:50	29.6
12:18:44	29.5
12:23:22	29.0
12:28:30	28.5
12:33:40	28.0

Total Gallons Removed: 13

Development Method: Double diaphragm pump

Decontamination Method: TSP wash DI rinse

Average Recharge Rate (foot/minute): 0.055

Purged Water Disposal: MW-GGC3,4,5,6 W7

Number of Drums: MW-GGC3,4,5,6 W7

Rinsate Disposal: MW-GGC3,4,5,6 W7

(3/18/91)

WELL DEVELOPMENT

Project No: S10112-A0

Project Name: GALBRAITH GOLF COURSE

Location: 10505 Doolittle Road

Recorded by: WKS

Weather Conditions: Showers, breezy

Precip. in last 5 days (inch): 0.1

Well No.: MW-GGC6 Date: 5/01/91

Depth of Well from TOC (feet): 17.5

Well Diameter (inch): 2

Screened Interval (feet): 5-15

TOC Elevation (feet): 17.49 PORT Datum

Water Level from TOC (feet): 10.38 Time: 13:00

Product Level from TOC (feet): None Time: 13:00

Water Level Measurement (feet): 7.11 PORT Datum

FIELD MEASUREMENTS

Time	Gallons Removed	Appearance
13:02	0	N/A
10:10	5	Very turbid
13:21	10	Turbid
13:34	15	Slightly turbid
13:40	20	Slightly turbid

Recharge:

Time	Water Level (feet)
13:51:29	11.8
13:52:58	11.3
13:53:21	11.2
13:53:49	11.1
13:54:21	11.0
13:54:53	10.9
13:55:34	10.8
13:56:28	10.7
14:02:28	10.5

Total Gallons Removed: 20

Development Method: Double diaphragm pump

Decontamination Method: TSP wash DI rinse

Average Recharge Rate (foot/minute): 0.12

Purged Water Disposal: MW-GGC3,4,5,6 W7

Number of Drums: MW-GGC3,4,5,6 W7

Rinsate Disposal: MW-GGC3,4,5,6 W7

(3/18/91)

WELL DEVELOPMENT

Project No: S10112-A0

Project Name: GALBRAITH GOLF COURSE

Location: 10505 Doolittle Road

Recorded by: WKS

Weather Conditions: Cloudy, possible showers

Precip. in last 5 days (inch): 0.1

Well No.: MW-GGC9 **Date:** 5/01/91, 5/02/91

Depth of Well from TOC (feet): 24.5

Well Diameter (inch): 2

Screened Interval (feet): 5-22

TOC Elevation (feet): 19.82 PORT Datum

Water Level from TOC (feet): 17.82 Time: 16:30

Product Level from TOC (feet): None Time: None

Water Level Measurement (feet): 2.00 PORT Datum

FIELD MEASUREMENTS

Time	Gallons Removed	Appearance
10:09	2.5	Very turbid
12:18	3.0	Turbid
12:39	4.0	Slightly turbid

Recharge:

Time	Water Level (feet)
10:11:20	24.3
10:12:59	24.1
10:16:12	23.9
10:21:15	23.7
10:26:27	23.5
10:32:02	23.3
10:57:41	22.3
11:48:00	18.3

Total Gallons Removed: 4.0

Development Method: Double diaphragm pump

Decontamination Method: TSP wash DI rinse

Average Recharge Rate (foot/minute): 0.06

Purged Water Disposal: MW-GGC7,8,9 W8

Number of Drums: MW-GGC7,8,9 W8

Rinsate Disposal: MW-GGC7,8,9 W8

(3/18/91)

WELL DEVELOPMENT

Project No: S10112-A0

Project Name: GALBRAITH GOLF COURSE

Location: 10505 Doolittle Road

Recorded by: WKS

Weather Conditions: Showers, breezy

Precip. in last 5 days (inch): 0.1

Well No.: MW-GGC6 **Date:** 5/01/91

Depth of Well from TOC (feet): 17.5

Well Diameter (inch): 2

Screened Interval (feet): 5-15

TOC Elevation (feet): 17.49 PORT Datum

Water Level from TOC (feet): 10.38 Time: 13:00

Product Level from TOC (feet): None Time: 13:00

Water Level Measurement (feet): 7.11 PORT Datum

FIELD MEASUREMENTS

Time	Gallons Removed	Appearance
13:02	0	N/A
10:10	5	Very turbid
13:21	10	Turbid
13:34	15	Slightly turbid
13:40	20	Slightly turbid

Recharge:

Time	Water Level (feet)
13:51:29	11.8
13:52:58	11.3
13:53:21	11.2
13:53:49	11.1
13:54:21	11.0
13:54:53	10.9
13:55:34	10.8
13:56:28	10.7
14:02:28	10.5

Total Gallons Removed: 20

Development Method: Double diaphragm pump

Decontamination Method: TSP wash DI rinse

Average Recharge Rate (foot/minute): 0.12

Purged Water Disposal: MW-GGC3,4,5,6 W7

Number of Drums: MW-GGC3,4,5,6 W7

Rinsate Disposal: MW-GGC3,4,5,6 W7

(3/18/91)

WELL DEVELOPMENT

Project No: S10112-A0

Project Name: GALBRAITH GOLF COURSE

Location: 10505 Doolittle Road

Recorded by: WKS

Weather Conditions: Showers, breezy

Precip. in last 5 days (inch): 0.1

Well No.: MW-GGC7 Date: 5/01/91, 5/02/91

Depth of Well from TOC (feet): 13.7

Well Diameter (inch): 2

Screened Interval (feet): 3-9.8

TOC Elevation (feet): 14.97 PORT Datum

Water Level from TOC (feet): 8.16 Time: 14:24

Product Level from TOC (feet): None Time: 14:24

Water Level Measurement (feet): 6.81 PORT Datum

FIELD MEASUREMENTS

Time	Gallons Removed	Appearance
14:29	0	Turbid
14:35	3	Turbid
11:10	4	Clear
11:21	6	Clear
11:44	7	Clear

Recharge:

Time	Water Level (feet)
14:38:14	13.2
14:40:22	13.1
14:43:25	13.0
14:47:22	12.9
14:51:42	12.8
14:57:18	12.7
15:02:32	12.6
15:08:46	12.5
15:15:15	12.4
16:01:57	11.7
16:09:07	11.6

Total Gallons Removed: 7

Development Method: Double diaphragm pump

Decontamination Method: TSP wash DI rinse

Average Recharge Rate (foot/minute): 0.01

Purged Water Disposal: MW-GGC7,8,9 W8

Number of Drums: MW-GGC7,8,9 W8

Rinsate Disposal: MW-GGC7,8,9 W8

(3/18/91)

WELL DEVELOPMENT

Project No: S10112-A0

Project Name: GALBRAITH GOLF COURSE

Location: 10505 Doolittle Road

Recorded by: WKS

Weather Conditions: Showers, breezy

Precip. in last 5 days (inch): 0.1

Well No.: MW-GGC8 **Date:** 5/01/91

Depth of Well from TOC (feet): 19.5

Well Diameter (inch): 2

Screened Interval (feet): 5-17

TOC Elevation (feet): 16.59 PORT Datum

Water Level from TOC (feet): 14.41 Time: 15:20

Product Level from TOC (feet): None Time: 15:20

Water Level Measurement (feet): 2.18 PORT Datum

FIELD MEASUREMENTS

Time	Gallons Removed	Appearance
15:23	0	Turbid (rancid odor)
15:42	5	Slightly turbid
15:52	7.5	Slightly turbid

Recharge:

Time	Water Level (feet)
(faster than discharge rate)	

Total Gallons Removed: 7.5

Development Method: Double diaphragm pump

Decontamination Method: TSP wash DI rinse

Average Recharge Rate (feet/minute): >1.6

Purged Water Disposal: MW-GGC7,8,9 W8

Number of Drums: MW-GGC7,8,9 W8

Rinsate Disposal: MW-GGC7,8,9 W8

(3/18/91)

WELL DEVELOPMENT

Project No: S10112-A0

Project Name: GALBRAITH GOLF COURSE

Location: 10505 Doolittle Road

Recorded by: WKS

Weather Conditions: Cloudy, possible showers

Precip. in last 5 days (inch): 0.1

Well No.: MW-GGC9 **Date:** 5/01/91, 5/02/91

Depth of Well from TOC (feet): 24.5

Well Diameter (inch): 2

Screened Interval (feet): 5-22

TOC Elevation (feet): 19.82 PORT Datum

Water Level from TOC (feet): 17.82 Time: 16:30

Product Level from TOC (feet): None Time: None

Water Level Measurement (feet): 2.00 PORT Datum

FIELD MEASUREMENTS

Time	Gallons Removed	Appearance
10:09	2.5	Very turbid
12:18	3.0	Turbid
12:39	4.0	Slightly turbid

Recharge:

Time	Water Level (feet)
10:11:20	24.3
10:12:59	24.1
10:16:12	23.9
10:21:15	23.7
10:26:27	23.5
10:32:02	23.3
10:57:41	22.3
11:48:00	18.3

Total Gallons Removed: 4.0

Development Method: Double diaphragm pump

Decontamination Method: TSP wash DI rinse

Average Recharge Rate (foot/minute): 0.06

Purged Water Disposal: MW-GGC7,8,9 W8

Number of Drums: MW-GGC7,8,9 W8

Rinsate Disposal: MW-GGC7,8,9 W8

(3/18/91)

BATES AND BAILEY
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TELEPHONE (415) 843-2007

P.O. BOX 592
BERKELEY, CA 94701-0592

May 2, 1991

Baseline Environmental Consulting
5900 Hollis St., Suite D
Emeryville, CA 94608

Attention: Bill Scott

Dear Bill,

Listed below are the elevations of the monitor wells located at the Galbraith Golf Course in Oakland. The elevations are based on City of Oakland datum, the bench mark being at the north-western corner of Doolittle Drive and Hegenberger Road No. 3523 with an elevation of 4.15 feet.

WELL	GROUND ELEVATION	CASING ELEVATION
MW-GGC1	5.83	7.93
MW-GGC2	1.75	4.22
MW-GGC3	2.14	4.79
MW-GGC4	8.28	10.95
MW-GGC5	13.35	15.92
MW-GGC6	8.49	11.34
MW-GGC7	4.99	8.82
MW-GGC8	8.16	10.44
MW-GGC9	11.26	13.67

Yours truly,

Robert W. Wilson - L.S.3833

RWW/dd

Curtis & Tompkins, Ltd., Analytical Laboratories. Since 1878
2323 Fifth Street. Berkeley. CA 94710. Phone (415) 486-0900

DATE RECEIVED: 04/26/91
DATE REPORTED: 05/06/91

LAB NUMBER: 103639

CLIENT: BASELINE ENVIRONMENTAL

PROJECT ID: S10112-00

LOCATION: GALBRAITH GOLF COURSE

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103639-1
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-00
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC1

DATE RECEIVED: 04/26/91
DATE ANALYZED: 04/30,05/03/91
DATE REPORTED: 05/06/91

Title 26 Metals in Soils & Wastes
Digestion Method: EPA 3050

METAL	RESULT mg/Kg	REPORTING LIMIT mg/Kg	METHOD
Antimony	ND	3.0	EPA 6010
Arsenic	4.6	2.5	EPA 7060
Barium	188	0.25	EPA 6010
Beryllium	0.48	0.10	EPA 6010
Cadmium	6.2	0.25	EPA 6010
Chromium (total)	68.1	0.50	EPA 6010
Cobalt	13.8	0.90	EPA 6010
Copper	126	0.50	EPA 6010
Lead	281	3.5	EPA 6010
Mercury	ND	0.09	EPA 7471
Molybdenum	ND	0.70	EPA 6010
Nickel	87.5	1.6	EPA 6010
Selenium	ND	3.5	EPA 6010
Silver	ND	0.50	EPA 6010
Thallium	ND	6.3	EPA 6010
Vanadium	39.1	0.50	EPA 6010
Zinc	428	0.50	EPA 6010

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Antimony	1	91	Mercury	5	91
Arsenic	3	88	Molybdenum	3	91
Barium	2	93	Nickel	<1	91
Beryllium	<1	96	Selenium	<1	91
Cadmium	4	92	Silver	4	100
Chromium	4	96	Thallium	10	84
Cobalt	1	87	Vanadium	3	91
Copper	<1	96	Zinc	4	92
Lead	5	88			

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 103639-2
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-00
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC2

DATE RECEIVED: 04/26/91
DATE ANALYZED: 04/30,05/03/91
DATE REPORTED: 05/06/91

Title 26 Metals in Soils & Wastes
Digestion Method: EPA 3050

METAL	RESULT mg/Kg	REPORTING LIMIT mg/Kg	METHOD
Antimony	ND	3.0	EPA 6010
Arsenic	ND	3.5	EPA 6010
Barium	203	0.25	EPA 6010
Beryllium	0.62	0.10	EPA 6010
Cadmium	2.3	0.25	EPA 6010
Chromium (total)	44.6	0.50	EPA 6010
Cobalt	12.0	0.90	EPA 6010
Copper	37.7	0.50	EPA 6010
Lead	ND	3.5	EPA 6010
Mercury	ND	0.10	EPA 7471
Molybdenum	ND	0.70	EPA 6010
Nickel	55.1	1.6	EPA 6010
Selenium	ND	3.5	EPA 6010
Silver	ND	0.50	EPA 6010
Thallium	ND	6.3	EPA 6010
Vanadium	39.4	0.50	EPA 6010
Zinc	57.1	0.50	EPA 6010

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Antimony	1	91	Mercury	5	91
Arsenic	3	88	Molybdenum	3	91
Barium	2	93	Nickel	<1	91
Beryllium	<1	96	Selenium	<1	91
Cadmium	4	92	Silver	4	100
Chromium	4	96	Thallium	10	84
Cobalt	1	87	Vanadium	3	91
Copper	<1	96	Zinc	4	92
Lead	5	88			

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103639-3
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-00
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC3

DATE RECEIVED: 04/26/91
DATE ANALYZED: 04/30,05/03/91
DATE REPORTED: 05/06/91

Title 26 Metals in Soils & Wastes
Digestion Method: EPA 3050

METAL	RESULT mg/Kg	REPORTING LIMIT mg/Kg	METHOD
Antimony	ND	3.0	EPA 6010
Arsenic	4.1	2.5	EPA 7060
Barium	158	0.25	EPA 6010
Beryllium	0.50	0.10	EPA 6010
Cadmium	2.4	0.25	EPA 6010
Chromium (total)	41.1	0.50	EPA 6010
Cobalt	11.1	0.90	EPA 6010
Copper	28.6	0.50	EPA 6010
Lead	ND	3.5	EPA 6010
Mercury	ND	0.09	EPA 7471
Molybdenum	ND	0.70	EPA 6010
Nickel	49.7	1.6	EPA 6010
Selenium	ND	3.5	EPA 6010
Silver	ND	0.50	EPA 6010
Thallium	ND	6.3	EPA 6010
Vanadium	35.5	0.50	EPA 6010
Zinc	48.1	0.50	EPA 6010

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Antimony	1	91	Mercury	5	91
Arsenic	3	88	Molybdenum	3	91
Barium	2	93	Nickel	<1	91
Beryllium	<1	96	Selenium	<1	91
Cadmium	4	92	Silver	4	100
Chromium	4	96	Thallium	10	84
Cobalt	1	87	Vanadium	3	91
Copper	<1	96	Zinc	4	92
Lead	5	88			

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103639-4
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-00
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC4

DATE RECEIVED: 04/26/91
DATE ANALYZED: 04/30,05/03/91
DATE REPORTED: 05/06/91

Title 26 Metals in Soils & Wastes
Digestion Method: EPA 3050

METAL	RESULT mg/Kg	REPORTING LIMIT mg/Kg	METHOD
Antimony	ND	3.0	EPA 6010
Arsenic	6.1	2.5	EPA 7060
Barium	156	0.25	EPA 6010
Beryllium	0.38	0.10	EPA 6010
Cadmium	3.4	0.25	EPA 6010
Chromium (total)	61.3	0.50	EPA 6010
Cobalt	13.5	0.90	EPA 6010
Copper	68.2	0.50	EPA 6010
Lead	68.2	3.5	EPA 6010
Mercury	0.44	0.09	EPA 7471
Molybdenum	ND	0.70	EPA 6010
Nickel	68.1	1.6	EPA 6010
Selenium	ND	3.5	EPA 6010
Silver	ND	0.50	EPA 6010
Thallium	ND	6.3	EPA 6010
Vanadium	36.4	0.50	EPA 6010
Zinc	156	0.50	EPA 6010

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Antimony	1	91	Mercury	5	91
Arsenic	3	88	Molybdenum	3	91
Barium	2	93	Nickel	<1	91
Beryllium	<1	96	Selenium	<1	91
Cadmium	4	92	Silver	4	100
Chromium	4	96	Thallium	10	84
Cobalt	1	87	Vanadium	3	91
Copper	<1	96	Zinc	4	92
Lead	5	88			

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103639-5
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-00
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC5

DATE RECEIVED: 04/26/91
DATE ANALYZED: 04/30,05/03/91
DATE REPORTED: 05/06/91

Title 26 Metals in Soils & Wastes
Digestion Method: EPA 3050

METAL	RESULT mg/Kg	REPORTING LIMIT mg/Kg	METHOD
Antimony	ND	3.0	EPA 6010
Arsenic	7.1	2.5	EPA 7060
Barium	503	0.25	EPA 6010
Beryllium	0.42	0.10	EPA 6010
Cadmium	5.7	0.25	EPA 6010
Chromium (total)	64.5	0.50	EPA 6010
Cobalt	17.0	0.90	EPA 6010
Copper	75.9	0.50	EPA 6010
Lead	242	3.5	EPA 6010
Mercury	0.23	0.09	EPA 7471
Molybdenum	ND	0.70	EPA 6010
Nickel	189	1.6	EPA 6010
Selenium	ND	3.5	EPA 6010
Silver	ND	0.50	EPA 6010
Thallium	ND	6.3	EPA 6010
Vanadium	34.3	0.50	EPA 6010
Zinc	538	0.50	EPA 6010

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Antimony	1	91	Mercury	5	91
Arsenic	3	88	Molybdenum	3	91
Barium	2	93	Nickel	<1	91
Beryllium	<1	96	Selenium	<1	91
Cadmium	4	92	Silver	4	100
Chromium	4	96	Thallium	10	84
Cobalt	1	87	Vanadium	3	91
Copper	<1	96	Zinc	4	92
Lead	5	88			

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103639-6
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-00
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC6

DATE RECEIVED: 04/26/91
DATE ANALYZED: 04/30,05/03/91
DATE REPORTED: 05/06/91

Title 26 Metals in Soils & Wastes
Digestion Method: EPA 3050

METAL	RESULT mg/Kg	REPORTING LIMIT mg/Kg	METHOD
Antimony	ND	3.0	EPA 6010
Arsenic	ND	3.5	EPA 6010
Barium	75.1	0.25	EPA 6010
Beryllium	0.32	0.10	EPA 6010
Cadmium	1.4	0.25	EPA 6010
Chromium (total)	46.7	0.50	EPA 6010
Cobalt	9.8	0.90	EPA 6010
Copper	16.8	0.50	EPA 6010
Lead	ND	3.5	EPA 6010
Mercury	ND	0.09	EPA 7471
Molybdenum	ND	0.70	EPA 6010
Nickel	33.4	1.6	EPA 6010
Selenium	ND	3.5	EPA 6010
Silver	ND	0.50	EPA 6010
Thallium	ND	6.3	EPA 6010
Vanadium	32.3	0.50	EPA 6010
Zinc	34.9	0.50	EPA 6010

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Antimony	1	91	Mercury	5	91
Arsenic	3	88	Molybdenum	3	91
Barium	2	93	Nickel	<1	91
Beryllium	<1	96	Selenium	<1	91
Cadmium	4	92	Silver	4	100
Chromium	4	96	Thallium	10	84
Cobalt	1	87	Vanadium	3	91
Copper	<1	96	Zinc	4	92
Lead	5	88			

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103639-7
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-00
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC7

DATE RECEIVED: 04/26/91
DATE ANALYZED: 04/30,05/03/91
DATE REPORTED: 05/06/91

Title 26 Metals in Soils & Wastes
Digestion Method: EPA 3050

METAL	RESULT mg/Kg	REPORTING LIMIT mg/Kg	METHOD
Antimony	ND	3.0	EPA 6010
Arsenic	4.5	2.5	EPA 7060
Barium	203	0.25	EPA 6010
Beryllium	0.54	0.10	EPA 6010
Cadmium	3.1	0.25	EPA 6010
Chromium (total)	43.0	0.50	EPA 6010
Cobalt	13.1	0.90	EPA 6010
Copper	57.3	0.50	EPA 6010
Lead	ND	3.5	EPA 6010
Mercury	ND	0.09	EPA 7471
Molybdenum	ND	0.70	EPA 6010
Nickel	66.4	1.6	EPA 6010
Selenium	ND	3.5	EPA 6010
Silver	ND	0.50	EPA 6010
Thallium	ND	6.3	EPA 6010
Vanadium	55.8	0.50	EPA 6010
Zinc	58.9	0.50	EPA 6010

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Antimony	1	91	Mercury	5	91
Arsenic	3	88	Molybdenum	3	91
Barium	2	93	Nickel	<1	91
Beryllium	<1	96	Selenium	<1	91
Cadmium	4	92	Silver	4	100
Chromium	4	96	Thallium	10	84
Cobalt	1	87	Vanadium	3	91
Copper	<1	96	Zinc	4	92
Lead	5	88			

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-1
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-AO
SAMPLE ID: MW-GGC1

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/23-24/91
DATE REPORTED: 05/28/91

Dissolved Title 26 Metals in Aqueous Solutions

METAL	RESULT ug/L	REPORTING LIMIT ug/L	METHOD
Antimony	ND	60.0	EPA 6010
Arsenic	ND	50.0	EPA 7060
Barium	26.7	5.0	EPA 6010
Beryllium	ND	2.0	EPA 6010
Cadmium	ND	5.0	EPA 6010
Chromium (total)	ND	10.0	EPA 6010
Cobalt	ND	18.0	EPA 6010
Copper	22.6	10.0	EPA 6010
Lead	ND	60.0	EPA 7420
Mercury	ND	0.2	EPA 7470
Molybdenum	ND	14.0	EPA 6010
Nickel	ND	32.0	EPA 6010
Selenium	ND	50.0	EPA 7740
Silver	ND	10.0	EPA 6010
Thallium	ND	50.0	EPA 7841
Vanadium	ND	10.0	EPA 6010
Zinc	ND	10.0	EPA 6010

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Antimony	3	108	Mercury	4	83
Arsenic	7	91	Molybdenum	2	106
Barium	1	112	Nickel	3	112
Beryllium	<1	119	Selenium	4	106
Cadmium	4	104	Silver	3	100
Chromium	3	112	Thallium	4	86
Cobalt	<1	111	Vanadium	2	110
Copper	1	104	Zinc	2	108
Lead	<1	103			

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-2
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-AO
SAMPLE ID: MW-GGC2

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/23-24/91
DATE REPORTED: 05/28/91

Dissolved Title 26 Metals in Aqueous Solutions

METAL	RESULT ug/L	REPORTING LIMIT ug/L	METHOD
Antimony	ND	60.0	EPA 6010
Arsenic	ND	50.0	EPA 7060
Barium	77.5	5.0	EPA 6010
Beryllium	ND	2.0	EPA 6010
Cadmium	ND	5.0	EPA 6010
Chromium (total)	ND	10.0	EPA 6010
Cobalt	ND	18.0	EPA 6010
Copper	24.7	10.0	EPA 6010
Lead	ND	60.0	EPA 7420
Mercury	ND	0.2	EPA 7470
Molybdenum	ND	14.0	EPA 6010
Nickel	ND	32.0	EPA 6010
Selenium	ND	50.0	EPA 7740
Silver	ND	10.0	EPA 6010
Thallium	ND	50.0	EPA 7841
Vanadium	ND	10.0	EPA 6010
Zinc	14.4	10.0	EPA 6010

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Antimony	3	108	Mercury	4	83
Arsenic	7	91	Molybdenum	2	106
Barium	1	112	Nickel	3	112
Beryllium	<1	119	Selenium	4	106
Cadmium	4	104	Silver	3	100
Chromium	3	112	Thallium	4	86
Cobalt	<1	111	Vanadium	2	110
Copper	1	104	Zinc	2	108
Lead	<1	103			

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103736-3
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-AO
SAMPLE ID: MW-GGC3

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/23-24/91
DATE REPORTED: 05/28/91

Dissolved Title 26 Metals in Aqueous Solutions

METAL	RESULT ug/L	REPORTING LIMIT ug/L	METHOD
Antimony	ND	60.0	EPA 6010
Arsenic	ND	50.0	EPA 7060
Barium	68.1	5.0	EPA 6010
Beryllium	ND	2.0	EPA 6010
Cadmium	ND	5.0	EPA 6010
Chromium (total)	ND	10.0	EPA 6010
Cobalt	ND	18.0	EPA 6010
Copper	57.9	10.0	EPA 6010
Lead	ND	60.0	EPA 7420
Mercury	ND	0.2	EPA 7470
Molybdenum	ND	14.0	EPA 6010
Nickel	ND	32.0	EPA 6010
Selenium	ND	50.0	EPA 7740
Silver	ND	10.0	EPA 6010
Thallium	ND	50.0	EPA 7841
Vanadium	ND	10.0	EPA 6010
Zinc	38.8	10.0	EPA 6010

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Antimony	3	108	Mercury	4	83
Arsenic	7	91	Molybdenum	2	106
Barium	1	112	Nickel	3	112
Beryllium	<1	119	Selenium	4	106
Cadmium	4	104	Silver	3	100
Chromium	3	112	Thallium	4	86
Cobalt	<1	111	Vanadium	2	110
Copper	1	104	Zinc	2	108
Lead	<1	103			

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-7
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-AO
SAMPLE ID: MW-GGC4

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/23-24/91
DATE REPORTED: 05/28/91

Dissolved Title 26 Metals in Aqueous Solutions

METAL	RESULT ug/L	REPORTING LIMIT ug/L	METHOD
Antimony	ND	60.0	EPA 6010
Arsenic	ND	50.0	EPA 7060
Barium	368	5.0	EPA 6010
Beryllium	ND	2.0	EPA 6010
Cadmium	ND	5.0	EPA 6010
Chromium (total)	24.0	10.0	EPA 6010
Cobalt	ND	18.0	EPA 6010
Copper	34.5	10.0	EPA 6010
Lead	ND	60.0	EPA 7420
Mercury	ND	0.2	EPA 7470
Molybdenum	ND	14.0	EPA 6010
Nickel	ND	32.0	EPA 6010
Selenium	ND	50.0	EPA 7740
Silver	ND	10.0	EPA 6010
Thallium	ND	50.0	EPA 7841
Vanadium	14.7	10.0	EPA 6010
Zinc	16.5	10.0	EPA 6010

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Antimony	3	108	Mercury	4	83
Arsenic	7	91	Molybdenum	2	106
Barium	1	112	Nickel	3	112
Beryllium	<1	119	Selenium	4	106
Cadmium	4	104	Silver	3	100
Chromium	3	112	Thallium	4	86
Cobalt	<1	111	Vanadium	2	110
Copper	1	104	Zinc	2	108
Lead	<1	103			

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-5
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-AO
SAMPLE ID: MW-GGC5

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/23-24/91
DATE REPORTED: 05/28/91

Dissolved Title 26 Metals in Aqueous Solutions

METAL	RESULT ug/L	REPORTING LIMIT ug/L	METHOD
Antimony	ND	600	EPA 6010
Arsenic	ND	50.0	EPA 7060
Barium	67.3	5.0	EPA 6010
Beryllium	ND	2.0	EPA 6010
Cadmium	ND	5.0	EPA 6010
Chromium (total)	20.0	10.0	EPA 6010
Cobalt	22.7	18.0	EPA 6010
Copper	330	100	EPA 6010
Lead	ND	60.0	EPA 7420
Mercury	ND	0.2	EPA 7470
Molybdenum	ND	14.0	EPA 6010
Nickel	ND	32.0	EPA 6010
Selenium	ND	50.0	EPA 7740
Silver	ND	10.0	EPA 6010
Thallium	ND	100	EPA 7841
Vanadium	ND	10.0	EPA 6010
Zinc	ND	100	EPA 6010

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Antimony	3	108	Mercury	4	83
Arsenic	7	91	Molybdenum	2	106
Barium	1	112	Nickel	3	112
Beryllium	<1	119	Selenium	4	106
Cadmium	4	104	Silver	3	100
Chromium	3	112	Thallium	4	86
Cobalt	<1	111	Vanadium	2	110
Copper	1	104	Zinc	2	108
Lead	<1	103			

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-4
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-AO
SAMPLE ID: MW-GGC6

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/23-24/91
DATE REPORTED: 05/28/91

Dissolved Title 26 Metals in Aqueous Solutions

METAL	RESULT ug/L	REPORTING LIMIT ug/L	METHOD
Antimony	ND	60.0	EPA 6010
Arsenic	ND	50.0	EPA 7060
Barium	59.6	5.0	EPA 6010
Beryllium	ND	2.0	EPA 6010
Cadmium	ND	5.0	EPA 6010
Chromium (total)	11.2	10.0	EPA 6010
Cobalt	ND	18.0	EPA 6010
Copper	74.6	10.0	EPA 6010
Lead	ND	60.0	EPA 7420
Mercury	ND	0.2	EPA 7470
Molybdenum	ND	14.0	EPA 6010
Nickel	ND	32.0	EPA 6010
Selenium	ND	50.0	EPA 7740
Silver	ND	10.0	EPA 6010
Thallium	ND	50.0	EPA 7841
Vanadium	ND	10.0	EPA 6010
Zinc	66.4	10.0	EPA 6010

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Antimony	3	108	Mercury	4	83
Arsenic	7	91	Molybdenum	2	106
Barium	1	112	Nickel	3	112
Beryllium	<1	119	Selenium	4	106
Cadmium	4	104	Silver	3	100
Chromium	3	112	Thallium	4	86
Cobalt	<1	111	Vanadium	2	110
Copper	1	104	Zinc	2	108
Lead	<1	103			

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 103736-8
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-AO
SAMPLE ID: MW-GGC7

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/23/91
DATE REPORTED: 05/28/91

Dissolved Title 26 Metals in Aqueous Solutions

METAL	RESULT ug/L	REPORTING LIMIT ug/L	METHOD
Antimony	ND	60.0	EPA 6010
Arsenic	ND	50.0	EPA 7060
Barium	191	5.0	EPA 6010
Beryllium	ND	2.0	EPA 6010
Cadmium	ND	5.0	EPA 6010
Chromium (total)	ND	10.0	EPA 6010
Cobalt	ND	18.0	EPA 6010
Copper	75.6	10.0	EPA 6010
Lead	ND	60.0	EPA 7420
Mercury	ND	0.2	EPA 7470
Molybdenum	ND	14.0	EPA 6010
Nickel	64.8	32.0	EPA 6010
Selenium	ND	50.0	EPA 7740
Silver	ND	10.0	EPA 6010
Thallium	ND	50.0	EPA 7841
Vanadium	ND	10.0	EPA 6010
Zinc	36.0	10.0	EPA 6010

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Antimony	3	108	Mercury	4	83
Arsenic	7	91	Molybdenum	2	106
Barium	1	112	Nickel	3	112
Beryllium	<1	119	Selenium	4	106
Cadmium	4	104	Silver	3	100
Chromium	3	112	Thallium	4	86
Cobalt	<1	111	Vanadium	2	110
Copper	1	104	Zinc	2	108
Lead	<1	103			

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-6
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-AO
SAMPLE ID: MW-GGC8

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/23-24/91
DATE REPORTED: 05/28/91

Dissolved Title 26 Metals in Aqueous Solutions

METAL	RESULT ug/L	REPORTING LIMIT ug/L	METHOD
Antimony	89.5	60.0	EPA 6010
Arsenic	ND	50.0	EPA 7060
Barium	953	5.0	EPA 6010
Beryllium	ND	2.0	EPA 6010
Cadmium	ND	5.0	EPA 6010
Chromium (total)	11.2	10.0	EPA 6010
Cobalt	ND	18.0	EPA 6010
Copper	37.3	10.0	EPA 6010
Lead	ND	60.0	EPA 7420
Mercury	ND	0.2	EPA 7470
Molybdenum	ND	14.0	EPA 6010
Nickel	ND	32.0	EPA 6010
Selenium	ND	50.0	EPA 7740
Silver	ND	10.0	EPA 6010
Thallium	ND	50.0	EPA 7841
Vanadium	ND	10.0	EPA 6010
Zinc	ND	10.0	EPA 6010

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Antimony	3	108	Mercury	4	83
Arsenic	7	91	Molybdenum	2	106
Barium	1	112	Nickel	3	112
Beryllium	<1	119	Selenium	4	106
Cadmium	4	104	Silver	3	100
Chromium	3	112	Thallium	4	86
Cobalt	<1	111	Vanadium	2	110
Copper	1	104	Zinc	2	108
Lead	<1	103			

Curtis & Tompkins Ltd.

LABORATORY NUMBER: 103736-9
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-AO
SAMPLE ID: MW-GGC9

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/23/91
DATE REPORTED: 05/28/91

Dissolved Title 26 Metals in Aqueous Solutions

METAL	RESULT ug/L	REPORTING LIMIT ug/L	METHOD
Antimony	ND	60.0	EPA 6010
Arsenic	ND	50.0	EPA 7060
Barium	1,060	5.0	EPA 6010
Beryllium	ND	2.0	EPA 6010
Cadmium	ND	5.0	EPA 6010
Chromium (total)	ND	10.0	EPA 6010
Cobalt	ND	18.0	EPA 6010
Copper	24.1	10.0	EPA 6010
Lead	ND	60.0	EPA 7420
Mercury	ND	0.2	EPA 7470
Molybdenum	ND	14.0	EPA 6010
Nickel	ND	32.0	EPA 6010
Selenium	ND	50.0	EPA 7740
Silver	ND	10.0	EPA 6010
Thallium	ND	50.0	EPA 7841
Vanadium	ND	10.0	EPA 6010
Zinc	ND	10.0	EPA 6010

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Antimony	3	108	Mercury	4	83
Arsenic	7	91	Molybdenum	2	106
Barium	1	112	Nickel	3	112
Beryllium	<1	119	Selenium	4	106
Cadmium	4	104	Silver	3	100
Chromium	3	112	Thallium	4	86
Cobalt	<1	111	Vanadium	2	110
Copper	1	104	Zinc	2	108
Lead	<1	103			

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-AO
LOCATION: GALBRAITH GOLF COURSE

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/08,09/91
DATE REPORTED: 05/22/91

ANALYSIS: CHLORIDE
ANALYSIS METHOD: EPA 300.0

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
103736-1	MW-GGC1	110	mg/L	15
103736-2	MW-GGC2	240	mg/L	15
103736-3	MW-GGC3	3,100	mg/L	1,500
103736-4	MW-GGC6	4,000	mg/L	1,500
103736-5	MW-GGC5	30,000	mg/L	1,500
103736-6	MW-GGC8	4,700	mg/L	1,500
103736-7	MW-GGC4	2,000	mg/L	1,500
103736-8	MW-GGC7	12,000	mg/L	1,500
103736-9	MW-GGC9	1,800	mg/L	1,500

QA/QC SUMMARY

RPD, %	1
Recovery, %	101

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 103736
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-AO
LOCATION: GALBRAITH GOLF COURSE

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/08,09/91
DATE REPORTED: 05/22/91

ANALYSIS: NITRATE
ANALYSIS METHOD: EPA 300.0

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
103736-1	MW-GGC1	9.9	mg/L	5.0
103736-2	MW-GGC2	36	mg/L	5.0
103736-3	MW-GGC3	29	mg/L	5.0
103736-4	MW-GGC6	ND	mg/L	5.0
103736-5	MW-GGC5	ND	mg/L	5.0
103736-6	MW-GGC8	ND	mg/L	5.0
103736-7	MW-GGC4	ND	mg/L	5.0
103736-8	MW-GGC7	47	mg/L	5.0
103736-9	MW-GGC9	ND	mg/L	5.0

QA/QC SUMMARY

RPD, %	1
Recovery, %	101

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103736
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-AO
LOCATION: GALBRAITH GOLF COURSE

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/09/91
DATE REPORTED: 05/22/91

ANALYSIS: TOTAL DISSOLVED SOLIDS
ANALYSIS METHOD: EPA 160.1

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
103736-1	MW-GGC1	850	mg/L	10
103736-2	MW-GGC2	910	mg/L	10
103736-3	MW-GGC3	7,000	mg/L	10
103736-4	MW-GGC6	8,700	mg/L	10
103736-5	MW-GGC5	56,000	mg/L	10
103736-6	MW-GGC8	11,000	mg/L	10
103736-7	MW-GGC4	6,100	mg/L	10
103736-8	MW-GGC7	23,000	mg/L	10
103736-9	MW-GGC9	4,900	mg/L	10

QA/QC SUMMARY

RPD, %	5

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 103736-1
CLIENT: BASELINE ENVIRONMENTAL
PROJECT #: S10112-AO
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC1

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/13/91
DATE REPORTED: 05/22/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	REPORTING LIMIT ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	9.3	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	2.4	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	39	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethylvinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	8
RECOVERY, %	82

Curtis & Tompkins Ltd.

LABORATORY NUMBER: 103736-1
CLIENT: BASELINE ENVIRONMENTAL
PROJECT #: S10112-AO
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC1

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/13/91
DATE REPORTED: 05/22/91

EPA 8020: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
Benzene	ND	1.0
Toluene	ND	1.0
Ethyl Benzene	ND	1.0
Total Xylenes	ND	1.0
Chlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	3
RECOVERY, %	95

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 103736-2
CLIENT: BASELINE ENVIRONMENTAL
PROJECT #: S10112-AO
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC2

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/13/91
DATE REPORTED: 05/22/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	REPORTING LIMIT ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethylvinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	8
RECOVERY, %	82

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103736-2
CLIENT: BASELINE ENVIRONMENTAL
PROJECT #: S10112-AO
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC2

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/13/91
DATE REPORTED: 05/22/91

EPA 8020: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
Benzene	ND	1.0
Toluene	ND	1.0
Ethyl Benzene	ND	1.0
Total Xylenes	ND	1.0
Chlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	3
RECOVERY, %	95

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 103736-3
CLIENT: BASELINE ENVIRONMENTAL
PROJECT #: S10112-AO
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC3

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/13/91
DATE REPORTED: 05/22/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	REPORTING LIMIT ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	2.0	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethylvinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	8
RECOVERY, %	82

Curtis & Tompkins Ltd.

LABORATORY NUMBER: 103736-3
CLIENT: BASELINE ENVIRONMENTAL
PROJECT #: S10112-AO
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC3

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/13/91
DATE REPORTED: 05/22/91

EPA 8020: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
Benzene	ND	1.0
Toluene	ND	1.0
Ethyl Benzene	ND	1.0
Total Xylenes	ND	1.0
Chlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	3
RECOVERY, %	95

LABORATORY NUMBER: 103736-7
CLIENT: BASELINE ENVIRONMENTAL
PROJECT #: S10112-AO
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC4

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/15/91
DATE REPORTED: 05/22/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	REPORTING LIMIT ug/L
chloromethane	ND	20
bromomethane	ND	20
vinyl chloride	ND	20
chloroethane	ND	20
methylene chloride	ND	10
trichlorofluoromethane	ND	10
1,1-dichloroethene	ND	10
1,1-dichloroethane	ND	10
cis-1,2-dichloroethene	ND	10
trans-1,2-dichloroethene	ND	10
chloroform	ND	10
freon 113	ND	10
1,2-dichloroethane	ND	10
1,1,1-trichloroethane	ND	10
carbon tetrachloride	ND	10
bromodichloromethane	ND	10
1,2-dichloropropane	ND	10
cis-1,3-dichloropropene	ND	10
trichloroethylene	ND	10
1,1,2-trichloroethane	ND	10
trans-1,3-dichloropropene	ND	10
dibromochloromethane	ND	10
2-chloroethylvinyl ether	ND	20
bromoform	ND	10
tetrachloroethene	ND	10
1,1,2,2-tetrachloroethane	ND	10
chlorobenzene	ND	10
1,3-dichlorobenzene	ND	10
1,2-dichlorobenzene	ND	10
1,4-dichlorobenzene	ND	10

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	4
RECOVERY, %	97

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-7
CLIENT: BASELINE ENVIRONMENTAL
PROJECT #: S10112-AO
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC4

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/15/91
DATE REPORTED: 05/22/91

EPA 8020: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
Benzene	ND	10
Toluene	ND	10
Ethyl Benzene	ND	10
Total Xylenes	ND	10
Chlorobenzene	ND	10
1,4-Dichlorobenzene	ND	10
1,3-Dichlorobenzene	ND	10
1,2-Dichlorobenzene	ND	10

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	2
RECOVERY, %	93

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-5
CLIENT: BASELINE ENVIRONMENTAL
PROJECT #: S10112-AO
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC5

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/13/91
DATE REPORTED: 05/22/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	REPORTING LIMIT ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethylvinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	8
RECOVERY, %	82

Curtis & Tompkins Ltd.

LABORATORY NUMBER: 103736-5
CLIENT: BASELINE ENVIRONMENTAL
PROJECT #: S10112-AO
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC5

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/13/91
DATE REPORTED: 05/22/91

EPA 8020: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
Benzene	ND	1.0
Toluene	1.1	1.0
Ethyl Benzene	ND	1.0
Total Xylenes	ND	1.0
Chlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	3
RECOVERY, %	95

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 103736-4
CLIENT: BASELINE ENVIRONMENTAL
PROJECT #: S10112-AO
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC6

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/13/91
DATE REPORTED: 05/22/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	REPORTING LIMIT ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethylvinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	8
RECOVERY, %	82

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-4
CLIENT: BASELINE ENVIRONMENTAL
PROJECT #: S10112-AO
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC6

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/13/91
DATE REPORTED: 05/22/91

EPA 8020: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
Benzene	ND	1.0
Toluene	ND	1.0
Ethyl Benzene	ND	1.0
Total Xylenes	ND	1.0
Chlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	3
RECOVERY, %	95

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 103736-8
CLIENT: BASELINE ENVIRONMENTAL
PROJECT #: S10112-AO
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC7

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/13/91
DATE REPORTED: 05/22/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	REPORTING LIMIT ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethylvinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	8
RECOVERY, %	82

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-8
CLIENT: BASELINE ENVIRONMENTAL
PROJECT #: S10112-AO
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC7

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/13/91
DATE REPORTED: 05/22/91

EPA 8020: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
Benzene	ND	1.0
Toluene	ND	1.0
Ethyl Benzene	ND	1.0
Total Xylenes	ND	1.0
Chlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	3
RECOVERY, %	95

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 103736-6
CLIENT: BASELINE ENVIRONMENTAL
PROJECT #: S10112-AO
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC8

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/13/91
DATE REPORTED: 05/22/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	REPORTING LIMIT ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethylvinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	8
RECOVERY, %	82

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-6
CLIENT: BASELINE ENVIRONMENTAL
PROJECT #: S10112-AO
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC8

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/13/91
DATE REPORTED: 05/22/91

EPA 8020: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
Benzene	ND	1.0
Toluene	ND	1.0
Ethyl Benzene	ND	1.0
Total Xylenes	ND	1.0
Chlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	3
RECOVERY, %	95

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-9
CLIENT: BASELINE ENVIRONMENTAL
PROJECT #: S10112-AO
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC9

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/17/91
DATE REPORTED: 05/22/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	REPORTING LIMIT ug/L
chloromethane	ND	20
bromomethane	ND	20
vinyl chloride	ND	20
chloroethane	ND	20
methylene chloride	ND	10
trichlorofluoromethane	ND	10
1,1-dichloroethene	ND	10
1,1-dichloroethane	ND	10
cis-1,2-dichloroethene	ND	10
trans-1,2-dichloroethene	ND	10
chloroform	ND	10
freon 113	ND	10
1,2-dichloroethane	ND	10
1,1,1-trichloroethane	ND	10
carbon tetrachloride	ND	10
bromodichloromethane	ND	10
1,2-dichloropropane	ND	10
cis-1,3-dichloropropene	ND	10
trichloroethylene	ND	10
1,1,2-trichloroethane	ND	10
trans-1,3-dichloropropene	ND	10
dibromochloromethane	ND	10
2-chloroethylvinyl ether	ND	20
bromoform	ND	10
tetrachloroethene	ND	10
1,1,2,2-tetrachloroethane	ND	10
chlorobenzene	ND	10
1,3-dichlorobenzene	ND	10
1,2-dichlorobenzene	ND	10
1,4-dichlorobenzene	ND	10

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	21
RECOVERY, %	96

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 103736-9
CLIENT: BASELINE ENVIRONMENTAL
PROJECT #: S10112-AO
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: MW-GGC9

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/17/91
DATE REPORTED: 05/22/91

EPA 8020: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
Benzene	ND	10
Toluene	ND	10
Ethyl Benzene	ND	10
Total Xylenes	ND	10
Chlorobenzene	ND	10
1,4-Dichlorobenzene	ND	10
1,3-Dichlorobenzene	ND	10
1,2-Dichlorobenzene	ND	10

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	1
RECOVERY, %	95

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-10
CLIENT: BASELINE ENVIRONMENTAL
PROJECT #: S10112-AO
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: TRAVEL BLANK 05/06/91

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/14/91
DATE REPORTED: 05/22/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	REPORTING LIMIT ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethylvinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	14
RECOVERY, %	95

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-10
CLIENT: BASELINE ENVIRONMENTAL
PROJECT #: S10112-AO
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: TRAVEL BLANK 05/06/91

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/14/91
DATE REPORTED: 05/22/91

EPA 8020: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
Benzene	ND	1.0
Toluene	ND	1.0
Ethyl Benzene	ND	1.0
Total Xylenes	ND	1.0
Chlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	13
RECOVERY, %	111

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-11
CLIENT: BASELINE ENVIRONMENTAL
PROJECT #: S10112-AO
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: TRAVEL BLANK 05/07/91

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/13/91
DATE REPORTED: 05/22/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	REPORTING LIMIT ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethylvinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	8
RECOVERY, %	82

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-11
CLIENT: BASELINE ENVIRONMENTAL
PROJECT #: S10112-AO
LOCATION: GALBRAITH GOLF COURSE
SAMPLE ID: TRAVEL BLANK 05/07/91

DATE RECEIVED: 05/07/91
DATE ANALYZED: 05/13/91
DATE REPORTED: 05/22/91

EPA 8020: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
Benzene	ND	1.0
Toluene	ND	1.0
Ethyl Benzene	ND	1.0
Total Xylenes	ND	1.0
Chlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	3
RECOVERY, %	95

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-1
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-A0
SAMPLE ID: MW-GGC1

DATE RECEIVED: 05/07/91
DATE EXTRACTED: 05/13/91
DATE ANALYZED: 05/15/91
DATE REPORTED: 05/22/91

EPA 8080: Organochlorine Pesticides and PCBs in Water
Extraction Method: EPA 3520

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
alpha-BHC	ND	0.1
beta-BHC	ND	0.1
gamma-BHC	ND	0.1
delta-BHC	ND	0.1
Heptachlor	ND	0.1
Aldrin	ND	0.1
Heptachlor Epoxide	ND	0.1
Endosulfan I	ND	0.1
Dieldrin	ND	0.1
4,4'-DDE	ND	0.1
Endrin	ND	0.1
Endosulfan II	ND	0.1
Endosulfan Sulfate	ND	0.1
4,4'-DDD	ND	0.1
Endrin Aldehyde	ND	0.1
4,4'-DDT	ND	0.1
Chlordane	ND	0.5
Methoxychlor	ND	0.5
Toxaphene	ND	0.5
Aroclor 1016	ND	0.5
Aroclor 1221	ND	0.5
Aroclor 1232	ND	0.5
Aroclor 1242	ND	0.5
Aroclor 1248	ND	0.5
Aroclor 1254	ND	0.5
Aroclor 1260	ND	0.5

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	11
RECOVERY, %	122

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-2
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-A0
SAMPLE ID: MW-GGC2

DATE RECEIVED: 05/07/91
DATE EXTRACTED: 05/13/91
DATE ANALYZED: 05/15/91
DATE REPORTED: 05/22/91

EPA 8080: Organochlorine Pesticides and PCBs in Water
Extraction Method: EPA 3520

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
alpha-BHC	ND	0.1
beta-BHC	ND	0.1
gamma-BHC	ND	0.1
delta-BHC	ND	0.1
Heptachlor	ND	0.1
Aldrin	ND	0.1
Heptachlor Epoxide	ND	0.1
Endosulfan I	ND	0.1
Dieldrin	ND	0.1
4,4'-DDE	ND	0.1
Endrin	ND	0.1
Endosulfan II	ND	0.1
Endosulfan Sulfate	ND	0.1
4,4'-DDD	ND	0.1
Endrin Aldehyde	ND	0.1
4,4'-DDT	ND	0.1
Chlordane	ND	0.5
Methoxychlor	ND	0.5
Toxaphene	ND	0.5
Aroclor 1016	ND	0.5
Aroclor 1221	ND	0.5
Aroclor 1232	ND	0.5
Aroclor 1242	ND	0.5
Aroclor 1248	ND	0.5
Aroclor 1254	ND	0.5
Aroclor 1260	ND	0.5

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	11
RECOVERY, %	122

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-3
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-A0
SAMPLE ID: MW-GGC3

DATE RECEIVED: 05/07/91
DATE EXTRACTED: 05/13/91
DATE ANALYZED: 05/15/91
DATE REPORTED: 05/22/91

EPA 8080: Organochlorine Pesticides and PCBs in Water
Extraction Method: EPA 3520

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
alpha-BHC	ND	0.1
beta-BHC	ND	0.1
gamma-BHC	ND	0.1
delta-BHC	ND	0.1
Heptachlor	ND	0.1
Aldrin	ND	0.1
Heptachlor Epoxide	ND	0.1
Endosulfan I	ND	0.1
Dieldrin	ND	0.1
4,4'-DDE	ND	0.1
Endrin	ND	0.1
Endosulfan II	ND	0.1
Endosulfan Sulfate	ND	0.1
4,4'-DDD	ND	0.1
Endrin Aldehyde	ND	0.1
4,4'-DDT	ND	0.1
Chlordane	ND	0.5
Methoxychlor	ND	0.5
Toxaphene	ND	0.5
Aroclor 1016	ND	0.5
Aroclor 1221	ND	0.5
Aroclor 1232	ND	0.5
Aroclor 1242	ND	0.5
Aroclor 1248	ND	0.5
Aroclor 1254	ND	0.5
Aroclor 1260	ND	0.5

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	11
RECOVERY, %	122

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-7
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-A0
SAMPLE ID: MW-GGC4

DATE RECEIVED: 05/07/91
DATE EXTRACTED: 05/13/91
DATE ANALYZED: 05/15/91
DATE REPORTED: 05/22/91

EPA 8080: Organochlorine Pesticides and PCBs in Water
Extraction Method: EPA 3520

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
alpha-BHC	ND	0.1
beta-BHC	ND	0.1
gamma-BHC	ND	0.1
delta-BHC	ND	0.1
Heptachlor	ND	0.1
Aldrin	ND	0.1
Heptachlor Epoxide	ND	0.1
Endosulfan I	ND	0.1
Dieldrin	ND	0.1
4,4'-DDE	ND	0.1
Endrin	ND	0.1
Endosulfan II	ND	0.1
Endosulfan Sulfate	ND	0.1
4,4'-DDD	ND	0.1
Endrin Aldehyde	ND	0.1
4,4'-DDT	ND	0.1
Chlordane	ND	0.5
Methoxychlor	ND	0.5
Toxaphene	ND	0.5
Aroclor 1016	ND	0.5
Aroclor 1221	ND	0.5
Aroclor 1232	ND	0.5
Aroclor 1242	ND	0.5
Aroclor 1248	ND	0.5
Aroclor 1254	ND	0.5
Aroclor 1260	ND	0.5

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	11
RECOVERY, %	122

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-5
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-A0
SAMPLE ID: MW-GGC5

DATE RECEIVED: 05/07/91
DATE EXTRACTED: 05/13/91
DATE ANALYZED: 05/15/91
DATE REPORTED: 05/22/91

EPA 8080: Organochlorine Pesticides and PCBs in Water
Extraction Method: EPA 3520

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
alpha-BHC	ND	0.1
beta-BHC	ND	0.1
gamma-BHC	ND	0.1
delta-BHC	ND	0.1
Heptachlor	ND	0.1
Aldrin	ND	0.1
Heptachlor Epoxide	ND	0.1
Endosulfan I	ND	0.1
Dieldrin	ND	0.1
4,4'-DDE	ND	0.1
Endrin	ND	0.1
Endosulfan II	ND	0.1
Endosulfan Sulfate	ND	0.1
4,4'-DDD	ND	0.1
Endrin Aldehyde	ND	0.1
4,4'-DDT	ND	0.1
Chlordane	ND	0.5
Methoxychlor	ND	0.5
Toxaphene	ND	0.5
Aroclor 1016	ND	0.5
Aroclor 1221	ND	0.5
Aroclor 1232	ND	0.5
Aroclor 1242	ND	0.5
Aroclor 1248	ND	0.5
Aroclor 1254	ND	0.5
Aroclor 1260	ND	0.5

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	11
RECOVERY, %	122

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-4
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-A0
SAMPLE ID: MW-GGC6

DATE RECEIVED: 05/07/91
DATE EXTRACTED: 05/13/91
DATE ANALYZED: 05/15/91
DATE REPORTED: 05/22/91

EPA 8080: Organochlorine Pesticides and PCBs in Water
Extraction Method: EPA 3520

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
alpha-BHC	ND	0.1
beta-BHC	ND	0.1
gamma-BHC	ND	0.1
delta-BHC	ND	0.1
Heptachlor	ND	0.1
Aldrin	ND	0.1
Heptachlor Epoxide	ND	0.1
Endosulfan I	ND	0.1
Dieldrin	ND	0.1
4,4'-DDE	ND	0.1
Endrin	ND	0.1
Endosulfan II	ND	0.1
Endosulfan Sulfate	ND	0.1
4,4'-DDD	ND	0.1
Endrin Aldehyde	ND	0.1
4,4'-DDT	ND	0.1
Chlordane	ND	0.5
Methoxychlor	ND	0.5
Toxaphene	ND	0.5
Aroclor 1016	ND	0.5
Aroclor 1221	ND	0.5
Aroclor 1232	ND	0.5
Aroclor 1242	ND	0.5
Aroclor 1248	ND	0.5
Aroclor 1254	ND	0.5
Aroclor 1260	ND	0.5

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	11
RECOVERY, %	122

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103736-8
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-A0
SAMPLE ID: MW-GGC7

DATE RECEIVED: 05/07/91
DATE EXTRACTED: 05/13/91
DATE ANALYZED: 05/15/91
DATE REPORTED: 05/22/91

EPA 8080: Organochlorine Pesticides and PCBs in Water
Extraction Method: EPA 3520

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
alpha-BHC	ND	0.1
beta-BHC	ND	0.1
gamma-BHC	ND	0.1
delta-BHC	ND	0.1
Heptachlor	ND	0.1
Aldrin	ND	0.1
Heptachlor Epoxide	ND	0.1
Endosulfan I	ND	0.1
Dieldrin	ND	0.1
4,4'-DDE	ND	0.1
Endrin	ND	0.1
Endosulfan II	ND	0.1
Endosulfan Sulfate	ND	0.1
4,4'-DDD	ND	0.1
Endrin Aldehyde	ND	0.1
4,4'-DDT	ND	0.1
Chlordane	ND	0.6
Methoxychlor	ND	0.6
Toxaphene	ND	0.6
Aroclor 1016	ND	0.6
Aroclor 1221	ND	0.6
Aroclor 1232	ND	0.6
Aroclor 1242	ND	0.6
Aroclor 1248	ND	0.6
Aroclor 1254	ND	0.6
Aroclor 1260	ND	0.6

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	11
RECOVERY, %	122

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-6
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-A0
SAMPLE ID: MW-GGC8

DATE RECEIVED: 05/07/91
DATE EXTRACTED: 05/13/91
DATE ANALYZED: 05/15/91
DATE REPORTED: 05/22/91

EPA 8080: Organochlorine Pesticides and PCBs in Water
Extraction Method: EPA 3520

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
alpha-BHC	ND	0.5
beta-BHC	Detected(0.3)	0.5
gamma-BHC	ND	0.5
delta-BHC	ND	0.5
Heptachlor	ND	0.5
Aldrin	ND	0.5
Heptachlor Epoxide	ND	0.5
Endosulfan I	ND	0.5
Dieldrin	ND	0.5
4,4'-DDE	ND	0.5
Endrin	ND	0.5
Endosulfan II	ND	0.5
Endosulfan Sulfate	ND	0.5
4,4'-DDD	ND	0.5
Endrin Aldehyde	ND	0.5
4,4'-DDT	ND	0.5
Chlordane	ND	2.5
Methoxychlor	ND	2.5
Toxaphene	ND	2.5
Aroclor 1016	ND	2.5
Aroclor 1221	ND	2.5
Aroclor 1232	ND	2.5
Aroclor 1242	ND	2.5
Aroclor 1248	ND	2.5
Aroclor 1254	ND	2.5
Aroclor 1260	ND	2.5

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	11
RECOVERY, %	122

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-9
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-A0
SAMPLE ID: MW-GGC9

DATE RECEIVED: 05/07/91
DATE EXTRACTED: 05/13/91
DATE ANALYZED: 05/15/91
DATE REPORTED: 05/22/91

EPA 8080: Organochlorine Pesticides and PCBs in Water
Extraction Method: EPA 3520

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
alpha-BHC	ND	1.1
beta-BHC	ND	1.1
gamma-BHC	ND	1.1
delta-BHC	ND	1.1
Heptachlor	ND	1.1
Aldrin	ND	1.1
Heptachlor Epoxide	ND	1.1
Endosulfan I	ND	1.1
Dieldrin	ND	1.1
4,4'-DDE	ND	1.1
Endrin	ND	1.1
Endosulfan II	ND	1.1
Endosulfan Sulfate	ND	1.1
4,4'-DDD	ND	1.1
Endrin Aldehyde	ND	1.1
4,4'-DDT	ND	1.1
Chlordane	ND	5.6
Methoxychlor	ND	5.6
Toxaphene	ND	5.6
Aroclor 1016	ND	5.6
Aroclor 1221	ND	5.6
Aroclor 1232	ND	5.6
Aroclor 1242	ND	5.6
Aroclor 1248	ND	5.6
Aroclor 1254	ND	5.6
Aroclor 1260	ND	5.6

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	11
RECOVERY, %	122

105136

BASELINE
5900 Hollis Street, Suite D
Emeryville, CA 94608
(415) 420-8686

CHAIN OF CUSTODY RECORD

Turn-Around Time: Normal
Lab: Curtis & Tompkins
Contact Person: Bill Scott

Project No.: 510112-A0
Project Name and Location: Galbraith Golf Course, 10505 Doolittle Ave
Samplers: (Signature) William K Scott

	No. Station	Date	Time	Media	Depth	Composites	No. of Containers	Station Location	608	Chloride, Nitrate, TDS	Title 26 metals	8010	8020					Remarks	Detection Limits
-1	MW-GGC1	5-6-91	12:00	Water			8		X	X	X	X	X						
-2	MW-GGC2	5-6-91	13:30	Water			8		X	X	X	X	X						
-3	MW-GGC3	5-6-91	15:15	Water			8		X	X	X	X	X						
-4	MW-GGC6	5-6-91	16:35	Water			8		X	X	X	X	X						
-5	MW-GGC5	5-7-91	9:30	Water			8		X	X	X	X	X						
-6	MW-GGC8	5-7-91	11:45	Water			8		X	X	X	X	X						
-7	MW-GGC4	5-7-91	12:30	Water			8		X	X	X	X	X						
-8	MW-GGC7	5-7-91	13:30	Water			8		X	X	X	X	X						
-9	MW-GGC9	5-7-91		Water			8		X	X	X	X	X						
-10	Travel Blank	5-6-91	8:00	Water			2					X	X						
-11	Travel Blank	5-7-91	8:00	Water			2					X	X						

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time	Condition of Samples upon Arrival at Laboratory:
				Cold
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time	
Relinquished by: (Signature) William K Scott	Date / Time 5-7-91 16:50	Received for Laboratory by: (Signature) [illegible]	Date / Time 5/7 16:50	Remarks: Metals Dissolved [illegible]

Curtis & Tompkins Ltd

LABORATORY NUMBER: 103736-9
CLIENT: BASELINE ENVIRONMENTAL
PROJECT ID: S10112-A0
SAMPLE ID: MW-GGC9

DATE RECEIVED: 05/07/91
DATE EXTRACTED: 05/13/91
DATE ANALYZED: 05/15/91
DATE REPORTED: 05/22/91

EPA 8080: Organochlorine Pesticides and PCBs in Water
Extraction Method: EPA 3520

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
alpha-BHC	ND	1.1
beta-BHC	ND	1.1
gamma-BHC	ND	1.1
delta-BHC	ND	1.1
Heptachlor	ND	1.1
Aldrin	ND	1.1
Heptachlor Epoxide	ND	1.1
Endosulfan I	ND	1.1
Dieldrin	ND	1.1
4,4'-DDE	ND	1.1
Endrin	ND	1.1
Endosulfan II	ND	1.1
Endosulfan Sulfate	ND	1.1
4,4'-DDD	ND	1.1
Endrin Aldehyde	ND	1.1
4,4'-DDT	ND	1.1
Chlordane	ND	5.6
Methoxychlor	ND	5.6
Toxaphene	ND	5.6
Aroclor 1016	ND	5.6
Aroclor 1221	ND	5.6
Aroclor 1232	ND	5.6
Aroclor 1242	ND	5.6
Aroclor 1248	ND	5.6
Aroclor 1254	ND	5.6
Aroclor 1260	ND	5.6

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	11
RECOVERY, %	122