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January 23, 1999

Mr. Yoshiro Tokiwa
US EPA, Region 9
75 Hawthorne Street
San Francisco, CA 94105

Re: Groundwater Monitoring
Westinghouse Emeryville Site, Emeryville, California

Dear Mr. Tokiwa:

Enclosed are two copies of the 1998 Groundwater Sampling and Analysis Report for the Westinghouse Emeryville Site in Emeryville, California. This report is submitted on behalf of CBS Corporation (formerly Westinghouse Electric Corporation).

If you have any questions, please feel free to call me at your convenience.

Sincerely,
***ALTA* Geosciences, Inc.**

Alex Tula, R.G.
Principal Consultant

Enclosure: Groundwater Sampling and Analysis Report, May, 1998

cc: Gordon Taylor – CBS Corp.
Ms. Susan Hugo – Alameda County Health Department

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1998 GROUNDWATER SAMPLING AND ANALYSIS REPORT

Westinghouse Emeryville Site
Emeryville, California

May 1998

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1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

This report presents the results of the May 1998 annual groundwater monitoring event for the Westinghouse Emeryville Site (Site), located in Emeryville, California. This report has been prepared by Alta Geosciences, Inc., on behalf of CBS Corporation (formerly Westinghouse Electric Corporation). Monitoring is required by the Second Amendment to the Consent Agreement and Final Order between Westinghouse and the U.S. Environmental Protection Agency (USEPA), Region 9, dated August 16, 1985. Groundwater monitoring is required only for Polychlorinated Biphenyls (PCBs), for the purpose of assessing potential PCB impacts to Site Groundwater.

Staff from ALTA Geosciences, Inc. performed field work for this event on May 13 and 14, 1998. Groundwater elevations were determined in eighteen wells and piezometers, and samples were collected from fourteen wells. Analytical testing was performed on these samples for PCBs at a California Certified Testing Laboratory. Data analysis and production of this report were under the direct supervision of an ALTA Geosciences, Inc., Civil Engineer and Engineering Geologist.

1.2 ORGANIZATION OF REPORT

This report presents Site information and background data in sufficient detail to identify the project and place the monitoring work in perspective. Previous groundwater monitoring work was completed by Engineering Science, Inc. from April 1986 to February 1990, EMCON from March 1991 to May 1996 and ALTA Geosciences, Inc. in April 1997. Groundwater elevation data and analytical data for PCBs from this prior work has been retained in summary tables in this report, and updated with the May 1998 data developed by ALTA Geosciences, Inc. Groundwater elevations were analyzed to develop groundwater contour maps for both shallow and deep wells. Groundwater contour maps are presented as Figures 3-1 and 3-2. The Appendices present copies of field and analytical data, as well as a quality control analysis of the analytical data.

2.0
SITE BACKGROUND AND PHYSICAL SETTING

2.1 SITE LOCATION AND DESCRIPTION

The project is located at 5899 Peladeau Street in the City of Emeryville, California, on the east side of the San Francisco Bay (Figure 2-1, Site Location Map). The portion of the Westinghouse Emeryville property in which groundwater monitoring is required is about 3 acres, in the NE portion of the property. The subject area is about 30 percent covered with Portland cement concrete (former building area), 20 percent covered with compacted gravel (former service yard), and 50 percent covered with asphalt concrete (engineered cap, see below). The site is fenced with a 6-foot high steel chainlink fence.

2.2 HISTORY OF SITE ACTIVITIES

This property was formerly the site of an electrical apparatus service facility, which serviced and manufactured transformers and other electrical equipment in addition to fulfilling administrative and engineering functions for their service district. Westinghouse ceased using the facility for work on electrical apparatus in 1982 and stopped using the facility for all work in 1992. Buildings on the Site have been demolished and only concrete floor slabs and foundations, plus outside pavements remain from the original facility.

Some of the manufacturing and service functions at the facility involved handling, storing, and/or using fluids containing or impacted with Polychlorinated Biphenyls (PCBs), volatile organic compounds (VOCs), hydrocarbon products such as gasoline and diesel, and mineral or hydraulic oils. Investigations conducted on the Site identified the above compounds as present in the groundwater and in some soils on the Site.

In 1984, WEC entered into a Consent Agreement and Final Order with the U.S. Environmental Protection Agency (EPA), Region 9 regarding the Site. As part of this Order, a slurry wall was constructed in 1985 in the northwest portion of the property to limit the lateral migration of impacted groundwater beneath the Site. PCB-impacted soil from areas surrounding the containment cell were consolidated into the cell, and an engineered cap of geomembrane and asphalt concrete was placed over the top.

At the request of the California Regional Water Quality Control Board, a site specific Baseline Human Health Risk Assessment (HHRA, SOMA, 1996) was performed for the former Westinghouse facility site east of the capped area and west of Peladeau

Street. This facility area extends south to Powell Street. Although this assessment focussed on the adjacent portions of the facility, the groundwater fate and transport modelling included the capped area. The groundwater fate and transport modelling showed no significant contaminants of concern to be migrating from the capped area. Based on the results of this HHRA, a soil remediation for PCBs was performed in the former service yard area at the north end of the former facility on the northeast side of the capped area (see Figure 3-1). The results of this soil remediation are summarized in *Completion Report, Site Remediation, Westinghouse Emeryville Site, Emeryville, CA.* (ALTA Geosciences, Inc. (ALTA) 1996). Following approval by the RWQCB, the parcels encompassing the former facility and the service yard were sold to a land developer (the capped area was retained by CBS Corp.).

By May, 1998, a multistory office building was being built on the former Westinghouse facility site which had been sold (east of the capped area and west of Peladeau Street and south to Powell Street). At the time of the groundwater sampling, substantial pile driving was underway on this parcel, adjacent to the capped area.

2.3 WELL CONSTRUCTION

In March 1983 nine wells, which had been constructed as part of an investigation of the Site, were sampled. PCBs were detected in five of these wells and VOCs in eight. These findings, along with related findings regarding PCB impacts to soils on the Site, lead to the construction in September and October 1985 of the slurry wall and engineered cap mentioned above. This construction destroyed all but one of the original monitoring wells, which was subsequently given the designation of D-6, and is still in use. In 1986, as part of the Consent Agreement and Final Order between Westinghouse and the USEPA, a post-construction groundwater monitoring program was initiated with the installation and sampling of thirteen additional wells. The stated purpose of this program was to assess and monitor PCB concentrations in the Site groundwater. Initially monitoring was done by Engineering Science, Inc. every two months. Starting in 1991, monitoring performed by EMCON was done semiannually, and presently, monitoring performed by ALTA Geosciences, Inc. is required annually.

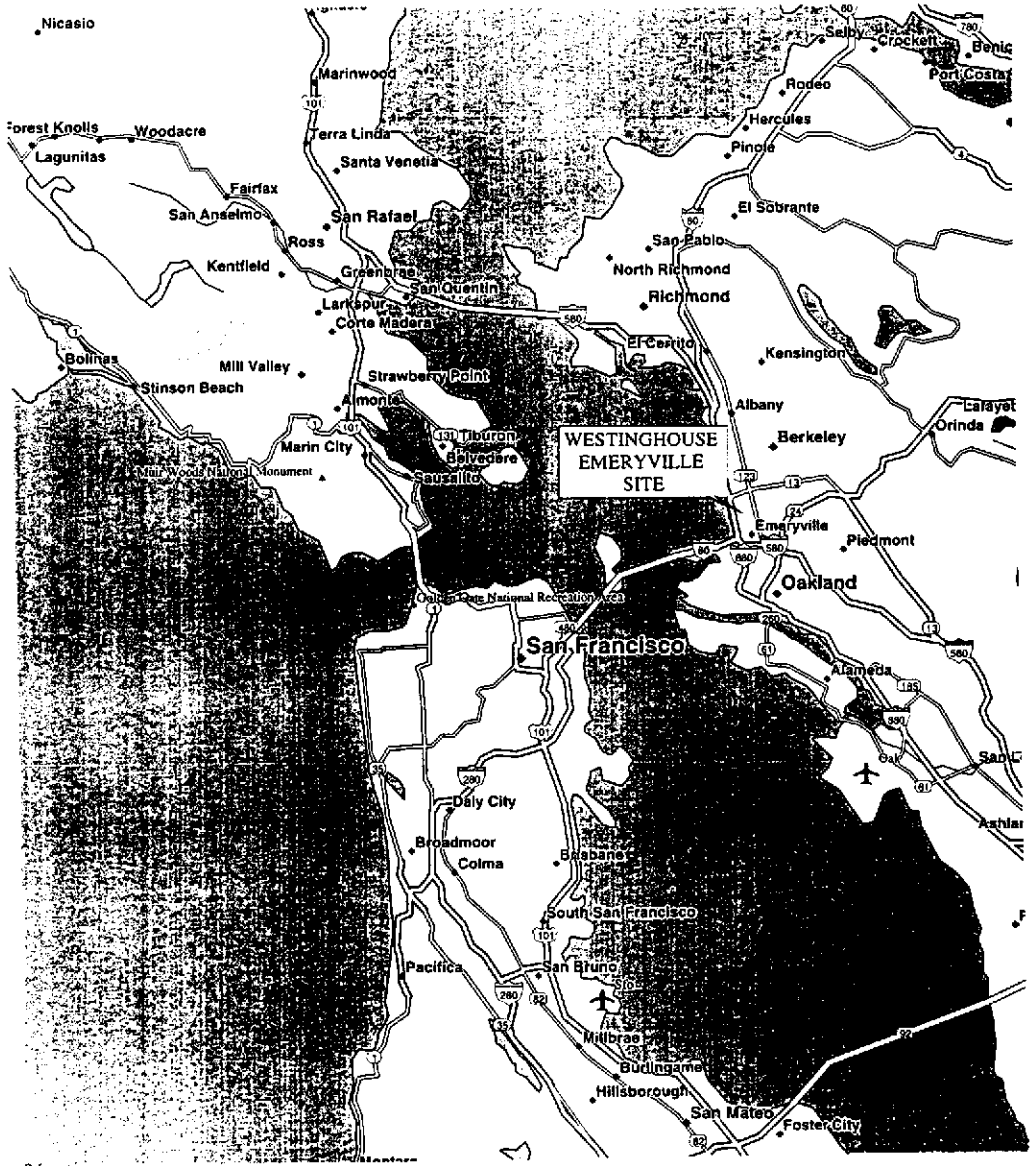
Because of damage during construction on the adjacent AMTRAK station, several wells have had to be repaired, and two wells, S-2 and D-2 had to be abandoned and replaced with S-2R and D-2R. At present the monitoring well network contains eight shallow wells (S-1, S-2R, and S-3 through S-8) which are screened approximately 9.5 to 24.5 feet below the ground surface. All shallow monitoring wells are all within the Site fence, except for S-8 which is a few feet south of the fence. Also included in the monitoring network are six deep wells (D-1, D-2R, and D-3 through D-6), which are screened approximately between 25 and 40 feet below the surface. These are all within the limits of the Site fence. Two shallow and two deep

piezometers are located within the slurry wall/capped area and are monitored for water depth only. All wells and piezometers are constructed with 2-inch diameter PVC casings. The surface completions vary because of construction at different times and because of differing local site conditions. Some wells have rectangular steel boxes approximately 2-1/2 feet tall, and some wells have flush completions and metal lids (especially in paved areas).

2.4 SITE INSPECTIONS

A site inspection was performed in May, 1998, in conjunction with the groundwater monitoring activities. All Site fencing was in place and in good condition. As noted in the report for last year, weeds continue to grow in some of the AC pavement cracks on the containment cell. The condition does not present a problem as far as the integrity of the cap is concerned. The AC cap is otherwise in good condition as of May 1998. Construction was underway on buildings located on the old Westinghouse Electric service facility property, southeast of the containment cell. The area immediately east of the cell was being used as a staging area and for contractor's offices.

A second site inspection was performed in December, 1998. Site fencing was in place and in generally good condition. The construction contractor was storing construction materials on the capped area, and had cut away a section of the Site fence between the former service yard where the contractor's offices were established (Figure 3-1) and the capped area to facilitate access. However, overall site security was maintained through a second fence around the contractor's offices. Weeds continue to grow in some of the AC pavement cracks on the containment cell. The condition does not present a problem as far as the integrity of the cap is concerned. The AC cap is otherwise in good condition as of December, 1998. Construction was underway on buildings located on the old Westinghouse Electric service facility property, southeast of the containment cell. The area immediately east of the cell was being used as a staging area and for contractor's offices.



Approximate Scale
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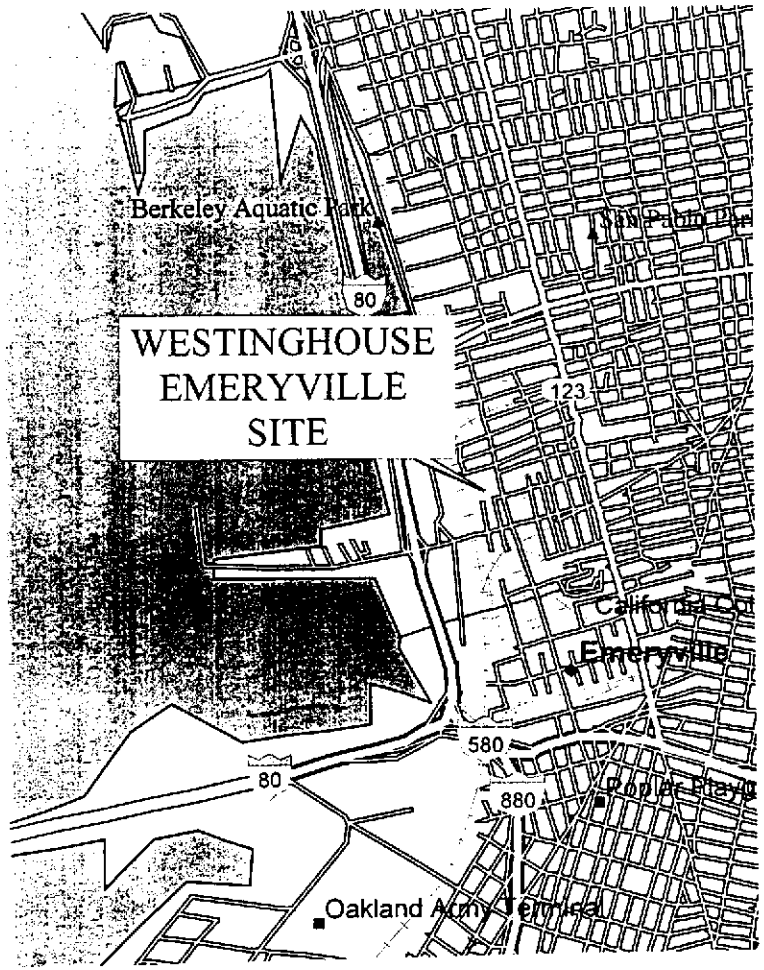


Approximate Scale
1 : 31,250 1" = 0.5 Miles

WESTINGHOUSE ELECTRIC CORPORATION
EMERYVILLE SITE, EMERYVILLE, CALIFORNIA
ANNUAL GROUNDWATER MONITORING

SITE LOCATION MAP

FIGURE 2-1 MAY 1998

ALTA GEOSCIENCES, INC.

3.0
MAY 1998 GROUNDWATER SAMPLING AND ANALYSIS

3.1 GROUNDWATER MONITORING LEVELS – MAY 1998

The depth to groundwater in each well was measured to the nearest 0.01 foot using an electronic well sounder. The May 13, 1998 water depths and elevations (MSL) are shown in Table 3-1. Figures 3-1 and 3-2 contain geologically interpreted groundwater contours in those portions of the Site where sufficient information is available to allow interpretation. Contours are intended to be a qualitative expression of the general head potential and direction of groundwater flow beneath the Site. The depth to water in the wells is also shown on these two figures (in parentheses, next to the well numbers).

Table 3-2 contains historical groundwater elevation data back to April 1986. The latest data was placed near the bottom of the table. Groundwater levels throughout the San Francisco Bay region have been steadily increasing for several years in response to wetter-than-normal rainfall. A review of the table indicates the present (5/98) groundwater levels are near the upper end of the range of seasonal fluctuations typically seen for the Site, and about one foot higher than five years before. This is true for levels both inside and outside the containment wall.

3.2 SAMPLING PROCEDURES

Groundwater samples were collected from 14 Site monitoring wells on 5/14/98 for analytical laboratory testing. To obtain a sample representative of the surrounding formation, each well was purged using a low-flow technique to reduce interference's associated with turbidity.

Measurement

Fluid level measurements in each monitoring well were completed with a flat tape water level meter to indicate depth to groundwater relative to the top of the well casings. Inspection of the tape after use at each well did not reveal the presence of floating oil.

Sampling

Sampling equipment consisted of a portable 12 Volt submersible pump (ES-40), discharging through Teflon-lined Tygon tubing to the surface. The tubing at the surface was connected to a flow meter to regulate flow. A water analyzer (QED Purgesaver) was lowered directly into the well beneath the pump. The 'Purgesaver' measured the parameters pH, temperature, conductivity, oxidation reduction potential, and dissolved oxygen levels using a polarographic probe (correcting for temperature and salinity). During purging, turbidity levels were measured at regular

intervals using a LaMotte Model 2008 Turbidity Meter. All meters were calibrated the day of use.

Wells were purged at a rate of 0.5 to 1.0 liters per minute with the submersible pump set above the screened interval. The parameters pH, temperature, conductivity, dissolved oxygen, oxidation reduction potential, and turbidity were monitored and recorded at regular intervals.

Prior to groundwater sampling, each well was purged until pH, conductivity and temperature readings stabilized within 10 percent, with a turbidity goal of <5 ntu, where possible. The samples were dispensed directly into laboratory provided containers. Each sample was appropriately labeled and stored on ice at approximately 4°C from the time of collection through the time of delivery to the laboratory, and chain of custody procedures were followed to ensure sample integrity.

Decontamination Procedures

All sampling equipment was decontaminated between each monitoring well location to avoid cross-contamination. The entire pump and hose assembly was immersed in an alconox detergent solution and allowed to circulate for at least 2 minutes. The assembly was then immersed in fresh tap water and run for another 2 minutes. The assembly was then rinsed by pumping at least 2 gallons of deionized water through the system. The water analyzer and flow meter were likewise washed and double rinsed.

Purge Water Storage

All purge water was stored in 55 gallon open-top drums at the site. The drums were closed with sealed lids, bolted, and appropriately labeled.

Documentation

Record keeping documentation for the samples included the use of the following:

- Fluid level measurement form; to record depth to fluid in each well.
- Groundwater sampling form; to record method of collection, purge volume, parameters pH, cond, temp., D.O., turbidity and general observations.
- Labels to identify individual samples; with well #, project name, date, time, samplers name and type of preservation (if any).
- Chain-of-custody record sheets; to document possession and transfer of samples and specify analysis requested.
- Field report form; Describing general site conditions, well integrity and condition of the asphalt cap.

Field records are included in Appendix A.

3.3 ANALYTICAL PROCEDURES

Sixteen samples from fourteen wells, including a duplicate and field rinse blank, were analyzed by Sequoia Analytical laboratory, Redwood City, California. All samples were analyzed by EPA Method 8080/8081 for PCBs. Results were reported for seven Aroclors, with a detection limit of one-tenth microgram per liter (1/10th part per billion) (EPA, 1986).

3.4 ANALYTICAL RESULTS

Testing results indicate no detectable PCBs in 12 wells and very low detections shallow wells, S-3 and S-5 (0.13 µg/L for both), which only slightly exceeded the detection limit (0.10µg/L . Historical analytical results are shown, along with the latest results on Table 3-3 for the deep wells and Table 3-4 for the shallow wells. Laboratory analysis certificates are contained in Appendix B

3.5 QUALITY ASSURANCE/QUALITY CONTROL

Appendix C contains a Data Quality Assurance Review of the laboratory reports. This review may be summarized as follows:

Holding Times -- all acceptable
Method Blanks -- two analyzed, no PCBs detected
Surrogate Recovery -- %R for DBC acceptable, %R for TXMX outside limits
Matrix Spike Recovery -- %R is acceptable
Blank Spike Recovery -- %R is acceptable
Precision -- RPD is acceptable
Completeness -- completeness is acceptable

See Appendix C for discussion of these parameters.

Table 3-1
Groundwater Levels On 5/13/97

WELL NUMBER	TOC ELEVATION (Feet, MSL)	DEPTH TO WATER (Feet)	WATER ELEVATION (Feet, MSL)
D-1	16.17	6.72	9.45
D-2R	14.45	5.02	9.43
D-3	13.21	4.68	8.53
D-4	14.12	3.08	11.04
D-5	12.07	1.97	10.10
D-6	13.75	1.49	12.26
S-1	15.99	8.20	7.79
S-2R	14.46	6.51	7.95
S-3	13.21	4.83	8.38
S-4	14.25	3.05	11.20
S-5	12.15	1.78	10.37
S-6	13.77	1.28	12.49
S-7	12.28	4.21	8.07
S-8	15.57	6.10	9.47
P-1	15.51	4.41	11.10
P-2	15.36	4.26	11.10
P-3	14.23	3.04	11.19
P-4	14.13	2.91	11.22

Table 3-2
Groundwater Elevation Data (Ft, MSL)[1]

Date	Monitoring Wells						
	D-1	D-2	D-2R	D-3	D-4	D-5	D-6
04/86	9.19	9.01	-	8.29	10.51	9.72	11.16
06/86	8.98	7.99	-	7.75	9.84	9.37	10.56
08/86	8.75	7.95	-	7.35	9.30	9.25	10.24
10/86	8.82	8.16	-	7.62	9.63	9.30	10.42
12/86	8.47	7.60	-	7.29	9.10	8.94	9.74
02/87	9.09	9.04	-	8.35	10.64	9.61	10.77
04/87	9.20	8.33	-	8.17	10.49	9.62	10.98
06/87	8.73	7.75	-	7.73	9.55	9.19	10.60
08/87	8.59	7.55	-	7.15	9.19	9.12	10.77
10/87	8.47	7.37	-	6.92	9.06	8.99	10.64
12/87	9.10	8.72	-	7.87	10.56	9.57	10.92
02/88	9.38	8.76	-	8.61	10.69	9.71	11.36
04/88	8.64	7.85	-	7.55	9.84	9.13	10.45
06/88	8.69	8.00	-	7.70	9.96	9.26	10.53
08/88	8.57	7.71	-	7.45	9.58	9.05	10.67
10/88	8.36	7.31	-	6.71	8.97	8.91	10.32
12/88	7.50	8.03	-	7.72	10.03	9.17	10.48
02/89	8.82	8.13	-	7.78	10.19	9.21	10.66
04/89	9.08	8.31	-	8.44	10.39	9.60	10.93
06/89	8.64	7.67	-	7.56	9.37	9.11	10.67
08/89	8.42	7.51	-	7.04	8.94	9.17	10.58
10/89	8.57	7.74	-	7.25	9.05	9.12	10.59
12/89	8.01	8.23	-	7.88	10.04	9.56	10.85
02/90	9.15	8.75	-	8.10	10.47	9.72	11.19
03/20/91	9.20	9.33	-	8.03	FW[2]	9.67	11.13
04/04/91	9.26	8.32	-	8.16	10.58	9.67	11.21
09/11/91	8.57	7.36	-	6.90	9.13	9.07	10.72
03/16/92	9.42	8.82	-	8.33	10.47	9.91	11.95
09/21/92	8.47	7.28	-	6.66	8.15	8.87	9.83
03/22/93	9.22	8.33	-	8.24	10.00	9.41	11.20
09/21/93	NS[3]	NA[3]	-	7.23	NS	8.98	10.23
05/17/94	4.31	NA	-	7.89	8.07	9.62	11.73
11/15/94	4.41	NA	-	8.25	8.55	9.79	11.93
05/23/95	9.08	NA	8.52	8.18	11.41	9.56	11.62
11/28/95	8.31	NA	8.25	7.07	8.79	8.42	10.10
05/16/96	9.05	NA	9.03	8.03	12.07	9.65	11.07
04/21/97	8.91	NA	8.87	7.88	10.87	9.53	12.02
05/13/98	9.45	NA	9.43	8.53	11.04	10.10	12.26
TOC[4] Elev.	16.17[5]	11.20	14.45[6]	13.21[5]	14.12[5]	12.07	13.75

Table 3-2
Groundwater Elevation Data
(Ft, MSL)[1](Continued)

	Monitoring Wells								
Date	S-1	S-2	S-2R	S-3	S-4	S-5	S-6	S-7	S-8
04/86	8.88	9.66	-	7.96	10.65	10.28	11.41	9.94	9.70
06/86	7.16	7.54	-	7.52	9.92	9.45	10.58	8.69	9.20
08/86	6.59	6.98	-	7.02	9.36	8.83	10.16	7.54	8.30
10/86	7.23	7.62	-	7.23	9.77	9.56	10.40	8.92	8.66
12/86	6.55	6.38	-	6.89	9.08	8.84	9.83	9.70	8.24
02/87	9.56	9.85	-	7.69	10.78	10.38	11.45	9.73	9.89
04/87	8.08	7.77	-	8.09	10.57	9.90	11.13	9.22	9.98
06/87	6.72	6.78	-	5.17	9.66	9.32	10.89	8.01	8.59
08/87	6.25	6.22	-	6.77	9.32	9.35	11.10	6.77	7.85
10/87	5.84	5.88	-	6.48	9.11	9.25	11.13	6.23	7.52
12/87	8.92	9.17	--	7.94	10.94	10.67	11.69	9.25	9.64
02/88	8.81	8.65	-	8.27	10.73	10.05	11.40	9.60	10.06
04/88	7.07	7.06	-	7.30	9.85	9.33	10.72	8.09	9.19
06/88	7.22	7.19	-	7.64	10.03	9.15	10.74	8.36	9.46
08/88	6.51	6.53	-	7.02	9.48	9.07	10.89	7.03	8.19
10/88	5.98	5.92	-	6.44	8.86	8.67	10.57	6.45	7.67
12/88	7.81	7.35	–	7.51	10.17	9.66	10.73	8.76	9.15
02/89	8.09	7.60	-	7.87	10.31	9.74	10.91	9.21	9.73
04/89	8.30	7.90	-	7.96	10.49	9.93	11.05	9.32	10.12
06/89	6.99	6.97	-	6.23	9.83	9.31	11.04	7.73	8.69
08/89	6.49	6.45	-	6.83	9.30	8.91	10.91	6.81	7.92
10/89	6.80	6.72	-	7.13	9.81	9.61	10.85	8.24	8.63
12/89	8.03	7.53	-	7.60	10.20	9.71	10.96	8.96	9.19
02/90	9.06	8.86	-	7.86	10.77	10.08	11.38	10.05	9.79
03/20/91	9.52	9.78	-	8.17	FW	10.74	12.11	10.11	9.99
04/04/91	8.54	7.83	-	8.00	10.61	10.15	11.27	9.46	9.84
09/11/91	6.12	6.06	-	6.62	9.30	8.90	10.82	7.23	9.02
03/16/92	9.00	8.66	-	8.17	11.06	10.62	12.35	10.08	6.54
09/21/92	5.82	5.68	-	6.30	8.23	8.90	9.77	6.08	4.96
03/22/93	8.68	7.78	-	8.10	10.82	9.22	11.25	9.62	9.61
09/21/93	NS	NA	-	7.01	NS	8.03	10.13	6.28	NS
05/17/94	3.23	NA	-	7.78	8.60	10.13	11.70	7.96	4.69
11/15/94	3.63	NA	-	7.99	9.26	10.77	12.47	8.35	4.83
05/23/95	7.11	NA	7.28	7.78	11.39	9.87	11.60	8.04	9.34
11/28/95	6.18	NA	6.10	7.01	8.93	9.07	10.19	6.04	8.17
05/16/96	8.28	NA	8.54	7.79	12.99	10.80	12.82	8.09	9.96
04/21/97	7.15	NA	7.16	7.72	11.07	10.40	12.25	7.65	9.67
05/13/98	7.79	NA	7.95	8.38	11.2	10.37	12.49	8.07	9.47
TOC[4] Elev.	15.99[5]	10.46	14.46[6]	13.21	14.25	12.15	13.77	12.28	15.57

Table 3-2
Groundwater Elevation Data
(Ft, MSL)[1]
(Continued)

	Piezometers			
Date	P-1	P-2	P-3	P-4
04/86	NR[7]	NR	NR	NR
06/86	NR	NR	NR	NR
08/86	6.19	6.31	4.86	4.80
10/86	6.48	6.67	5.27	5.23
12/86	7.16	7.15	5.81	5.72
02/87	7.29	7.13	5.94	5.83
04/87	7.35	6.95	6.06	5.57
06/87	8.74	6.79	5.39	5.34
08/87	6.57	6.67	5.21	5.18
10/87	6.84	6.90	5.55	5.45
12/87	7.09	6.94	5.64	5.60
02/88	7.34	7.33	6.26	5.99
04/88	7.13	7.17	5.92	5.86
06/88	6.84	6.87	5.63	5.43
08/88	8.34	6.59	5.27	5.13
10/88	9.19	6.95	5.55	5.49
12/88	7.20	7.21	5.91	5.72
02/89	7.46	7.38	FW	5.67
04/89	7.29	7.14	5.87	5.72
06/89	6.75	6.84	5.46	5.03
08/89	6.51	6.64	5.19	5.16
10/89	6.75	6.94	5.48	5.30
12/89	6.72	6.77	5.49	5.21
02/90	7.15	7.00	5.81	5.82
03/20/91	8.75	8.95	8.95	8.93
04/04/91	8.94	8.97	8.90	9.00
09/11/91	9.53	9.53	9.58	9.54
03/16/92	9.23	9.28	9.23	9.27
09/21/92	9.51	9.46	9.43	9.57
03/22/93	9.47	9.45	9.43	9.47
09/21/93	9.71	9.74	9.77	9.79

Table 3-2
Groundwater Elevation Data
(Ft, MSL)[1]
(Continued)

	Piezometers			
Date	P-1	P-2	P-3	P-4
05/17/94	10.96	9.99	9.97	10.01
11/15/95	9.47	9.53	9.49	9.62
05/23/95	10.54	10.57	10.55	10.62
11/28/95	9.19	9.18	9.23	9.20
05/16/96	10.76	10.72	10.80	10.82
04/21/97	10.25	10.12	10.28	10.21
05/13/98	11.10	11.10	11.19	11.22
TOC[4] Elevations	15.51	15.36	14.23	14.13

1 ft, MSL = feet relative to mean sea level. All data from April 1986 to February 1990 were taken from the ESI report of February 23, 1990, and were calculated from ESI monitoring well elevations (top of steel casing). Groundwater elevation data beginning with March 1991 were calculated from April 2, 1991, well elevation survey data.
2 FW = flooded well; water was detected at or above the top of the well casing.
3 NS = not surveyed.
4 TOC = top of casing; TOC elevations were surveyed by EMCON on April 2, 1991.
5 Elevation resurveyed by EMCON on June 14, 1995.
6 Elevation surveyed by EMCON on June 14, 1995.
7 NR = not recorded.
8 NA = not accessible; well covered with concrete.

Table 3-3
Analytical Results[1]
Deep Wells (µg/l)[2]

Polychlorinated Biphenyls (PCBs) As Total Aroclors							
	Monitoring Wells						
Date	D-1	D-2	D-2R	D-3	D-4	D-5	D-6
04/86	ND[3]	ND	-	ND	ND	ND	14.3
06/86	ND	ND	-	ND	ND	ND	1.8
08/86	0.1	ND	-	ND	ND	0.2	6.7
10/86	ND	ND	-	ND	ND	ND	3.2
12/86	ND	ND	-	ND	ND	0.8	8.4
02/87	ND	ND	-	ND	ND	0.5	5.5
04/87	ND	ND	-	ND	0.3	ND	1.9
06/87	ND	ND	-	ND	ND	0.2	6.0
08/87	0.4	ND	-	ND	ND	ND	3.1
10/87	0.1	ND	-	ND	0.2	0.3	4.4
12/87	ND	ND	-	0.1	ND	0.5	1.8
02/88	ND	0.1	-	ND	ND	0.4	0.6
04/88	ND	ND	-	ND	ND	1.9	1.6
06/88	ND	0.1	-	ND	ND	1.5	3.2
08/88	ND	1.5	-	ND	ND	0.7	4.9
10/88	ND	1.8	-	0.3	0.2	31.0	1.4
12/88	ND	0.3	-	0.4	ND	5.2	21.9
02/89	ND	0.3	-	0.3	ND	2.8	8.0
04/89	ND	0.2	-	ND	ND	2.1	8.8
06/89	ND	0.7	-	ND	ND	0.5	3.9
08/89	ND	ND	-	ND	0.2	5.3	4.2
10/89	ND	0.1	-	0.4	ND	2.7	8.4
12/89	ND	0.3	-	ND	ND	3.0	6.7
02/90	ND	0.2	-	0.2	ND	5.0	4.5
03/91	<0.1[4]	0.2	-	0.1	<0.1	0.2	1.0
09/91	<0.1	<0.1	-	<0.1	<0.1	<0.2	0.4
03/92	<0.1	<0.1	-	<0.1	<0.1	<0.1	0.2
09/92	<0.1	<0.1	-	<0.1	<0.1	0.2	0.3
03/93	0.1	<0.1	-	<0.1	<0.1	<0.1	0.5
09/93	NS[5]	NS[5]	-	<0.1	NS	0.1	0.3
05/94	NA[6]	NS[5]	-	<0.1	<0.1	<0.1	0.4
11/94	NA[6]	NS[5]	-	<0.1	<0.1	<0.1	0.8
05/95	<0.1	NS[5]	<0.1	<0.1	0.1	<0.1	<0.1
11/95	<1	NS[5]	<1	<1	<1	<1	<1
05/96	<0.1	NS[5]	<0.1	<0.1	<0.1	0.5	<0.1
04/97	<0.1	AB[7]	<0.1	<0.1	<0.1	<0.1	<0.1
05/98	<0.1	AB[7]	<0.1	<0.1	<0.1	<0.1	<0.1

1. All data from April 1986 to February 1990 were taken from the ESI report of February 23, 1990
2. µg/l = micrograms per liter
3. ND = not detected at or above the method reporting limit
4. < = not detected at or above the specified method reporting limit
5. NS = not sampled
6. NA = not accessible. Well casing bent
7. AB = Well abandoned during Amtrak Station construction

Table 3-4
Analytical Results[1]
Shallow Wells (µg/l)[2]

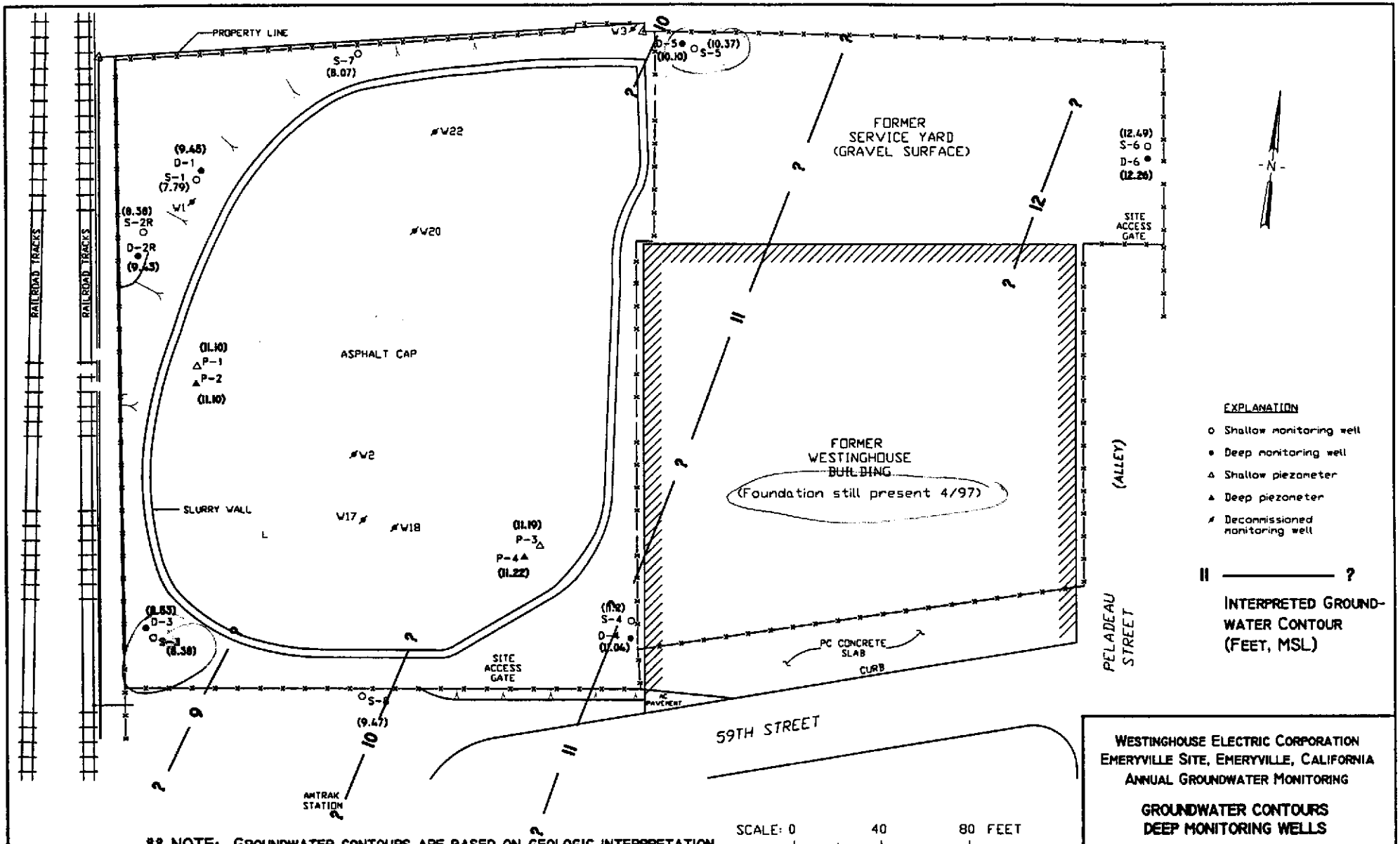
Polychlorinated Biphenyls (PCBs) as Total Aroclors									
	Monitoring Wells								
Date	S-1	S-2	S-2R	S-3	S-4	S-5	S-6	S-7	S-8
04/86	ND[3]	ND	-	4.0	ND	ND	ND	ND	ND
06/86	0.8	0.8	-	1.4	0.8	1.9	1.4	1.5	0.7
08/86	0.7	0.2	-	0.1	0.3	0.5	2.7	2.4	0.9
10/86	0.9	0.7	-	0.3	0.3	1.6	2.2	0.5	0.8
12/86	0.8	0.5	-	0.5	0.5	0.7	2.6	2.4	2.3
02/87	0.8	0.3	-	0.3	0.2	0.2	0.1	1.1	0.4
04/87	0.6	0.2	-	0.9	0.3	0.4	1.8	0.4	0.1
06/87	0.3	0.3	-	ND	ND	0.4	1.3	0.3	0.2
08/87	ND	ND	-	ND	ND	0.7	1.2	0.7	ND
10/87	0.2	0.1	-	ND	0.1	0.3	2.4	0.4	ND
12/87	0.3	ND	-	ND	ND	0.5	1.3	0.8	0.3
02/88	0.8	ND	-	ND	0.2	0.5	1.8	6.9	0.5
04/88	0.2	0.2	-	0.2	ND	0.9	2.1	1.6	0.2
06/88	0.2	0.1	-	0.1	ND	5.7	2.1	1.3	0.1
08/88	0.3	ND	-	ND	1.2	1.9	1.2	1.3	ND
10/88	0.4	ND	-	0.3	ND	4.4	0.7	4.0	0.2
12/88	0.3	0.2	-	ND	ND	1.5	6.0	0.4	ND
02/89	0.3	0.2	-	ND	ND	1.7	5.0	1.2	1.1
04/89	0.5	ND	-	0.1	ND	0.8	1.0	1.2	0.2
06/89	0.6	0.2	-	ND	ND	0.3	1.1	0.5	ND
08/89	19.0	0.2	-	0.1	0.2	2.9	4.3	0.6	ND
10/89	0.2	0.2	-	1.5	ND	4.0	1.8	2.7	0.4
12/89	0.3	ND	-	0.6	ND	4.0	2.8	1.9	0.9
02/90	0.6	ND	-	0.5	ND	2.2	1.0	0.9	0.1
03/91	0.6	0.3	-	0.5	0.1	1.0	0.2	3.0	<0.1[4]
09/91	1.4	0.3	-	0.6	0.2	1.0	0.2	1.6	<0.1
03/92	0.4	<0.1	-	0.2	<0.1	0.2	0.2	0.4	<1[5]
09/92	0.5	0.2	-	<0.1	0.2	0.7	0.4	0.4	<0.1
03/93	<0.1	0.4	-	<0.1	<0.1	0.4	<0.1	0.8	<0.1
09/93	NS[6]	NS[6]	-	<0.1	NS	0.3	0.2	0.6	NS
05/94	0.2	NS[6]	-	<0.1	<0.1	0.2	0.2	0.2	<0.1
11/94	0.1	NS[6]	-	<0.1	<0.1	0.2	0.2	0.2	<0.1

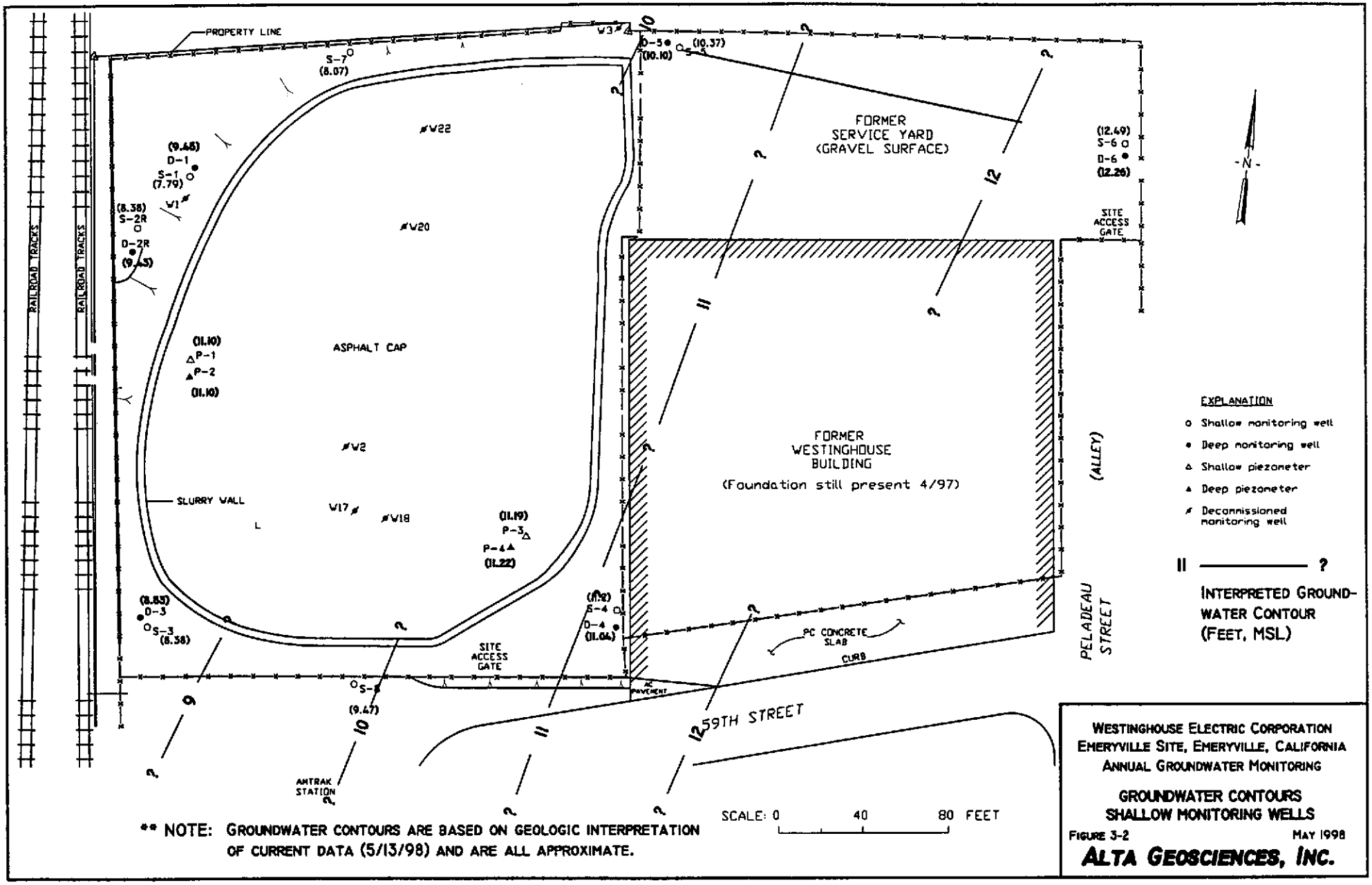
1. All data from April 1986 to February 1990 were taken from the ESI report of February 23, 1990
2. µg/l= micrograms per liter
3. ND = not detected at or above the method reporting limit
4. < = not detected at or above the specified method reporting limit
5. Elevated method reporting limit due to matrix interference
6. NS = not sampled
7. AB = Well abandoned during Amtrak Station construction

Table 3-4
Analytical Results[1]
Shallow Wells (µg/l)[2]
(Continued)

Polychlorinated Biphenyls (PCBs) as Total Aroclors									
	Monitoring Wells								
Date	S-1	S-2	S-2R	S-3	S-4	S-5	S-6	S-7	S-8
05/95	0.6	NS[6]	<0.1	<0.1	<0.1	0.4	<0.1	<0.1	<0.1
11/95	<1	NS[6]	<1	<1	<1	<1	<1	<1	<1
05/96	<0.1	NS[6]	<0.1	<0.1	<0.1	0.8	<0.1	<0.1	<0.1
04/97	<0.1	AB[7]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
05/98	<0.1	AB[7]	<0.1	0.13	<0.1	0.13	<0.1	<0.1	<0.1

1. All data from April 1986 to February 1990 were taken from the ESI report of February 23, 1990
2. µg/l= micrograms per liter
3. ND = not detected at or above the method reporting limit
4. < = not detected at or above the specified method reporting limit
5. Elevated method reporting limit due to matrix interference
6. NS = not sampled
7. AB = Well abandoned during Amtrak Station construction


PROPERTY LINE
S-7
(8.07)
W3
D-5
(10.10)
S-5
(10.37)
W22
(9.68)
D-1
S-1
(7.79)
W1
(8.38)
S-2R
D-2R
(9.43)
W20
FORMER
SERVICE YARD
(GRAVEL SURFACE)
(12.49)
S-6
D-6
(12.26)
SITE
ACCESS
GATE
RAILROAD TRACKS
RAILROAD TRACKS
(11.10)
P-1
P-2
(11.10)
ASPHALT CAP
W2
SLURRY WALL
W17
W18
(11.19)
P-3
P-4
(11.22)
FORMER
WESTINGHOUSE
BUILDING
(Foundation still present 4/97)
(ALLEY)
(8.83)
D-3
S-3
(8.38)
(11.12)
S-4
D-4
(11.04)
PC CONCRETE
SLAB
CURB
SITE
ACCESS
GATE
S-8
(9.47)
AC
PAVEMENT
PELADEAU
STREET
59TH STREET
AMTRAK
STATION
SCALE: 0 40 80 FEET
EXPLANATION
Shallow monitoring well
Deep monitoring well
Shallow piezometer
Deep piezometer
Decommissioned monitoring well
INTERPRETED GROUND-WATER CONTOUR (FEET, MSL)
** NOTE: GROUNDWATER CONTOURS ARE BASED ON GEOLOGIC INTERPRETATION OF CURRENT DATA (5/13/98) AND ARE ALL APPROXIMATE.
WESTINGHOUSE ELECTRIC CORPORATION
EMERYVILLE SITE, EMERYVILLE, CALIFORNIA
ANNUAL GROUNDWATER MONITORING
GROUNDWATER CONTOURS
DEEP MONITORING WELLS
FIGURE 3-1
MAY 1998
ALTA GEOSCIENCES, INC.



** NOTE: GROUNDWATER CONTOURS ARE BASED ON GEOLOGIC INTERPRETATION OF CURRENT DATA (5/13/98) AND ARE ALL APPROXIMATE.

WESTINGHOUSE ELECTRIC CORPORATION
EMERYVILLE SITE, EMERYVILLE, CALIFORNIA
ANNUAL GROUNDWATER MONITORING

GROUNDWATER CONTOURS
SHALLOW MONITORING WELLS

FIGURE 3-2 MAY 1998

ALTA GEOSCIENCES, INC.

4.0
CONCLUSION

Sampling and testing for annual groundwater monitoring at the Westinghouse Emeryville Site were completed in May 1998. Analysis of samples from shallow wells S-3 and S-5 indicate the presence of PCB at very low levels (0.13 µg/L for each well). These detections are inferred to be the result of well and ground disturbance as a result of adjacent pile-driving and other heavy construction activities. All other samples were non-detect for PCBs. Groundwater levels were determined to be at the high end of the historic range of levels for this Site. This may also have contributed to the mobilization of small amounts of PCBs from previously unsaturated sediments.

Sampling employed low-flow sampling techniques with a submersible pump that greatly reduces the turbidity of the samples collected, compared to bailing or use of higher flow pumps. This approach has been adopted as an approved technique by the USEPA for PCB sampling, and has proven useful for properly characterizing the PCB impacts to groundwater at this and other similar sites.

5.0 REFERENCES

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APPENDIX A
FIELD PROCEDURES

1998

ALTA GEOSICIENCES, Inc. **GROUNDWATER MONITORING**

Project WESTINGHOUSE Job # 10-431

Location EMERYVILLE Date 5/13/98

Measured By: N. Cooper Weather Sunny 60°F

WELL #	WELL TYPE	DEPTH TO WATER (feet)	TOTAL WELL DEPTH (feet)	DEPTH TO PRODUCT (feet)	DATE	TIME	COMMENTS
S-1	2" PVC	8.20	21.4	–	5/13/98	1545	1 - FULL DRUM PURGE H2O
D-1		6.72	45.2	–		1546	
S-2R		6.51	23.0	–		1548	
D-2R		5.02	39.4	–		1549	
S-3		4.83	24.7	–		1552	1 - FULL DRUM PURGE H2O
D-3		4.68	39.4	–		1551	
S-4		3.05	22.1	–		1540	
D-4		3.08	38.8	–		1539	
S-5		1.78	19.3	–		1536	1 - ½ FULL DRUM PURGE H2O
D-5		1.97	40.1	–		1535	
S-6		1.28	20.0	–		1534	
D-6		1.49	29.4	–		1533	
S-7		4.21	20.1	–		1542	
S-8		6.10	24.7	–		1600	
P-1		4.41	19.5	–		1553	
P-2		4.26	39.3	–		1554	
P-3		3.04	19.6	–		1557	
P-4	↓	2.91	36.9	–		1552	

ALTA GEOSCIENCES — **LOW-FLOW GROUNDWATER SAMPLING**

CLIENT	WESTINGHOUSE	JOB NO.	
LOCATION	BATAVIA	SAMPLED BY	MCC
WEATHER	SUNNY 65°F		

WELL NO. D-1 WATER DEPTH 6.72 DATE 5/14/98 PUMP TYPE 12 V SUB

WELL DEPTH 15.2 PURGE RATE 1.2 LPM

DIAMETER CASING VOLUME 6.5

VOLUME Gallons	TEMP °C	pH	COND uS	O_2 mg/l	ORP	TURBIDITY ntu	NOTES
2	18.3	5.97	382	0.0		11.3	PUT @
4	18.2	6.05	420	0.0		3.4	20'
6	18.2	6.10	432	0.0		1.7	
8	18.1	6.14	443	0.0		1.2	
10	18.2	6.09	442	0.0		0.5	
12	18.2	6.11	442	0.0		1.5	
12	19.9	7.28	675	10.1		1.8	2' ABOVE

SAMPLE NO. D-1 DATE 5/14/98 TIME 1130

WELL NO. S-1 WATER DEPTH 8.20 DATE 5/14/98 PUMP TYPE 12 V SUB

WELL DEPTH 21.4 PURGE RATE 1 LPM

DIAMETER CASING VOLUME 2.2

VOLUME Gallons	TEMP °C	pH	COND uS	O_2 mg/l	ORP	TURBIDITY ntu	NOTES
2	17.0	5.75	433	0.0		25.1	PUT @
4	17.0	5.92	420	0.0		10.5	20'
6	17.0	5.95	471	0.0		2.2	
6	18.6	6.75	750	0.2		2.4	2' ABOVE

SAMPLE NO. S-1 DATE 5/14/98 TIME 1230

WELL NO. _____ WATER DEPTH _____ DATE _____ PUMP TYPE _____

WELL DEPTH _____ PURGE RATE _____

DIAMETER CASING VOLUME

VOLUME Gallons	TEMP °C	pH	COND uS	O_2 mg/l	ORP	TURBIDITY ntu	NOTES

SAMPLE NO. DATE TIME

CALIBRATION	MODEL	DATE	CHECK
pH			
COND			
TURBIDITY			

1 GALLON = 3.785 LITERS 2" WELL = 0.17 GALLONS/FOOT 4"WELL = 0.66 GALLONS/FOOT

ALTA GEOSCIENCES — **LOW-FLOW GROUNDWATER SAMPLING**

CLIENT	WESTINGHOUSE	JOB NO.	
LOCATION	EMERYVILLE	SAMPLED BY	MK
WEATHER	SUNNY 60 °F		

WELL NO. S-7 WATER DEPTH 4.21 DATE 5/14/98
WELL DEPTH 20.1 PUMP TYPE 12 V SUB
DIAMETER CASING VOLUME 2.7 PURGE RATE 0.6 LPM

VOLUME Gallons	TEMP °C	pH	COND uS	O_2 mg/l	ORP	TURBIDITY ntu	NOTES
2	17.1	5.17	440	0.3		16.0	PUMP @ 15'
4	17.3	5.23	443	0.1		7.1	
6	17.4	5.25	449	0.1		3.7	
8	17.4	5.27	450	0.1		1.9	
5	16.7	6.62	762	0.2		1.4	4' /min

SAMPLE NO. S-7 DATE 5/14/98 TIME 1100

FIELD RINSE BLANK FB-1 TAKEN @ 1115

WELL NO. D-2R WATER DEPTH 5.02 DATE 5/14/98
WELL DEPTH 39.4 PUMP TYPE 12V SUB
DIAMETER CASING VOLUME 5.0 PURGE RATE 1.2 LPM

VOLUME Gallons	TEMP °C	pH	COND uS	O_2 mg/l	ORP	TURBIDITY ntu	NOTES
2	18.0	5.65	389	0.2		2.0	PUMP SET @ 20'
4	17.8	5.69	400	0.1		3.0	
6	18.0	5.72	401	0.1		1.4	
8	17.9	5.75	411	0.0		1.9	
10	18.0	5.75	415	0.0		0.7	
12	18.0	5.76	411	0.0		0.6	
12	19.2	6.79	670	0.1		1.6	1' /min

SAMPLE NO. D-2R DATE 5/14/98 TIME 1300

WELL NO. S-2R WATER DEPTH 6.51 DATE 5/14/98
WELL DEPTH 23.0 PUMP TYPE 12 V SUB
DIAMETER CASING VOLUME 2.8 PURGE RATE 1 LPM

VOLUME Gallons	TEMP °C	pH	COND uS	O_2 mg/l	ORP	TURBIDITY ntu	NOTES
2	17.0	5.97	425	0.1		2.7	PUMP @ 20'
4	16.9	6.01	429	0.0		0.7	
6	16.9	6.05	427	0.0		0.5	
5	18.1	6.76	650	0.1		1.1	3' /min

SAMPLE NO. S-2R DATE 5/14/98 TIME 1400

CALIBRATION	MODEL	DATE	CHECK
pH			
COND			
TURBIDITY			

1 GALLON = 3.785 LITERS 2" WELL = 0.17 GALLONS/FOOT 4"WELL = 0.66 GALLONS/FOOT

ALTA GEOSCIENCES **LOW-FLOW GROUNDWATER SAMPLING**

CLIENT	WESTINGHOUSE		
LOCATION	[illegible]	JOB NO.	
WEATHER	SUNNY 65 °F	SAMPLED BY	OGL

WELL NO. D-3 WATER DEPTH 4.68 DATE 5/14/98
WELL DEPTH 39.9 PUMP TYPE 12V SUB
DIAMETER CASING VOLUME 5.9 PURGE RATE 0.5 LPM

VOLUME Gallons	TEMP °C	pH	COND uS	O_2 mg/l	ORP	TURBIDITY ntu	NOTES
2	17.3	5.95	476	0.1		14.6	PUMP @ 20'
4	17.8	6.21	610	0.1		4.7	
6	17.6	6.23	644	0.1		3.3	
8	17.5	6.20	647	0.1		2.5	
10	17.5	6.21	645	0.1		1.3	
	19.5	7.04	807	0.1		2.7	8' DRW

SAMPLE NO. D-3 DATE 5/14/98 TIME 1400

WELL NO. S-3 WATER DEPTH 4.83 DATE 5/14/98
WELL DEPTH 24.7 PUMP TYPE 12V SUB
DIAMETER CASING VOLUME 3.4 PURGE RATE 0.6 LPM

VOLUME Gallons	TEMP °C	pH	COND uS	O_2 mg/l	ORP	TURBIDITY ntu	NOTES
2	17.0	6.03	885	0.1		9.8	PUMP @ 15'
4	17.0	6.11	793	0.1		5.2	
6	17.0	6.15	812	0.1		1.0	
5	19.2	7.0	993	0.1		1.2	5' DRW

SAMPLE NO. S-3 DATE 5/14/98 TIME 1530

WELL NO. S-8 WATER DEPTH 6.10 DATE 5/14/98
WELL DEPTH 24.7 PUMP TYPE 12V SUB
DIAMETER CASING VOLUME 3.2 PURGE RATE 0.6 LPM

VOLUME Gallons	TEMP °C	pH	COND uS	O_2 mg/l	ORP	TURBIDITY ntu	NOTES
2	16.7	5.10	628	0.1		16.1	PUMP @ 20'
4	16.7	5.15	644	0.1		3.4	
6	16.7	5.17	632	0.1		2.9	
5	18.6	6.56	698	0.2		1.8	

SAMPLE NO. S-8 DATE 5/14/98 TIME 1700

CALIBRATION	MODEL	DATE	CHECK
pH			
COND			
TURBIDITY			

1 GALLON = 3.785 LITERS 2" WELL = 0.17 GALLONS/FOOT 4"WELL = 0.66 GALLONS/FOOT

ALTA GEOSCIENCES — **LOW-FLOW GROUNDWATER SAMPLING**

CLIENT	WESTINGHOUSE		
LOCATION	EMERYVILLE	JOB NO.	
WEATHER	SUNNY 60°F	SAMPLED BY	DLC

WELL NO. D-5 — WATER DEPTH 1.97 — DATE 5/14/98

WELL DEPTH 40.1 — PUMP TYPE 12 V SUB

DIAMETER — CASING VOLUME 6.5 — PURGE RATE 1 LPM

VOLUME Gallons	TEMP °C	pH	COND uS	O_2 mg/l	ORP	TURBIDITY ntu	NOTES
2	18.8	5.84	877	0.0		28.1	PUMP @ 20'
4	18.7	5.92	455	0.0		4.6	
6	18.7	5.87	491	0.0		1.8	
8	18.7	5.91	489	0.0		1.1	
10	18.7	5.89	486	0.0		0.9	
10	19.9	6.98	590	0.1		2.0	2' FLOW

SAMPLE NO. D-5 — DATE 5/14/98 — TIME 0800

DUPLICATE OF D-5 DUP-1 TAKEN @ 0801

WELL NO. S-5 — WATER DEPTH 1.78 — DATE 5/14/98

WELL DEPTH 19.3 — PUMP TYPE 12 V SUB

DIAMETER — CASING VOLUME 3.0 — PURGE RATE 0.5 LPM

VOLUME Gallons	TEMP °C	pH	COND uS	O_2 mg/l	ORP	TURBIDITY ntu	NOTES
2	17.9	5.28	633	0.0		53	PUMP @ 10'
4	17.9	5.35	635	0.0		7.7	
6	17.9	5.36	636	0.0		3.4	
6	18.9	6.8	731	0.1		4.7	

SAMPLE NO. S-5 — DATE 5/14/98 — TIME 0900

MS/MSD TAKEN

WELL NO. D-6 — WATER DEPTH 1.49 — DATE 5/13/98

WELL DEPTH 29.4 — PUMP TYPE 12 V SUB

DIAMETER — CASING VOLUME 4.8 — PURGE RATE 0.5 LPM

VOLUME Gallons	TEMP °C	pH	COND uS	O_2 mg/l	ORP	TURBIDITY ntu	NOTES
2	18.3	5.92	582	0.0	—	2.6	PUMP @ 20'
4	18.3	5.86	588	0.0	—	2.8	
6	18.3	5.87	588	6.0	—	1.5	
8	18.3	5.98	586	0.0			
8	19.5	6.71	685	0.1		1.2	8' FLOW

SAMPLE NO. D-6 — DATE 5/13/98 — TIME 1630

CALIBRATION	MODEL	DATE	CHECK
pH	AQUA	5/14	✓
COND	CIECK	↓	✓
TURBIDITY		✓	✓

1 GALLON = 3.785 LITERS — 2" WELL = 0.17 GALLONS/FOOT — 4"WELL = 0.66 GALLONS/FOOT

ALTA GEOSCIENCES **LOW-FLOW GROUNDWATER SAMPLING**

CLIENT	WOODWARD	JOB NO.	421-01
LOCATION	EMERYVILLE	SAMPLED BY	TGL
WEATHER	SUNNY 60°F		

WELL NO. S-6 WATER DEPTH 1.28 DATE 5/13/98 PUMP TYPE 12 V SUB

WELL DEPTH 20.0 PURGE RATE 1 L/min

DIAMETER CASING VOLUME 3.2

VOLUME Gallons	TEMP °C	pH	COND uS	O_2 mg/l	ORP	TURBIDITY ntu	NOTES
1	17.5	5.21	633	0.0		11.5	PUMP @ 15'
2	17.5	5.22	635	0.0		6.1	
3	17.5	5.25	638	0.0		1.8	
4	17.5	5.28	638	0.0		1.6	
5	17.5	5.30	638	0.0		1.0	
5	18.6	6.48	717	0.1		0.9	2' /min

SAMPLE NO. S-6 DATE 5/14/98 TIME 1730

WELL NO. D-4 WATER DEPTH 3.08 DATE 5/14/98 PUMP TYPE 12 V SUB

WELL DEPTH 38.8 PURGE RATE 1 L/m.

DIAMETER CASING VOLUME 6.1

VOLUME Gallons	TEMP °C	pH	COND uS	O_2 mg/l	ORP	TURBIDITY ntu	NOTES
2	19.2	5.37	1110	0.0		1.0	PUMP @ 20'
4	19.3	5.41	745	0.0		5.4	
6	19.3	5.41	692	0.0		0.8	
8	19.3	5.42	719	0.0		0.2	
10	19.3	5.41	719	0.0		0.2	
10	20.0	6.86	1105	0.1		0.7	7' /min

SAMPLE NO. D-4 DATE 5/14/98 TIME 0920

WELL NO. S-4 WATER DEPTH 3.05 DATE 5/14/98 PUMP TYPE 12 V SUB

WELL DEPTH 22.1 PURGE RATE 1 L/m

DIAMETER CASING VOLUME 3.2

VOLUME Gallons	TEMP °C	pH	COND uS	O_2 mg/l	ORP	TURBIDITY ntu	NOTES
2	18.5	5.25	772	0.0		7.8	PUMP @ 15'
4	18.4	5.90	586	0.0		6.6	
6	18.3	5.37	551	0.0		2.2	
6	19.3	6.74	869	0.1		1.8	1.5' /min

SAMPLE NO. S-4 DATE 5/14/98 TIME 1020

CALIBRATION	MODEL	DATE	CHECK
pH			
COND			
TURBIDITY			

1 GALLON = 3.785 LITERS 2" WELL = 0.17 GALLONS/FOOT 4"WELL = 0.66 GALLONS/FOOT

APPENDIX B
ANALYTICAL TESTING RESULTS

Sequoia Analytical

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1455 McDowell Blvd. North, Ste. D, Petaluma, CA 94954, (707) 792-1865, FAX (707) 792-0342

Alta Geoscience	Client Proj. ID: Westinghouse, Emeryville	Sampled: 05/14/98
11711 Northcreek Parkway S.	Sample Descript: S-1	Received: 05/15/98
Suite 101	Matrix: LIQUID	Extracted: 05/19/98
Bothell, WA 98011	Analysis Method: EPA 8080	Analyzed: 05/26/98
Attention: Alex Tula	Lab Number: 9805B24-01	Reported: 05/28/98

QC Batch Number: GC0519980PCBEXZ
Instrument ID: GCHP12

Polychlorinated Biphenyls (EPA 8080)

Analyte	Detection Limit ug/L	Sample Results ug/L
PCB-1016	0.10	N.D.
PCB-1221	0.40	N.D.
PCB-1232	0.10	N.D.
PCB-1242	0.10	N.D.
PCB-1248	0.10	N.D.
PCB-1254	0.10	N.D.
PCB-1260	0.10	N.D.

Surrogates	Control Limits %		% Recovery
Dibutylchlorendate	50	150	101
Tetrachloro-m-xylene	50	150	44 Q

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
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1455 McDowell Blvd. North, Ste. D, Petaluma, CA 94954, (707) 792-1865, FAX (707) 792-0342

Alta Geoscience	Client Proj. ID: Westinghouse, Emeryville	Sampled: 05/14/98
11711 Northcreek Parkway S.	Sample Descript: D-1	Received: 05/15/98
Suite 101	Matrix: LIQUID	Extracted: 05/19/98
Bothell, WA 98011	Analysis Method: EPA 8080	Analyzed: 05/26/98
Attention: Alex Tula	Lab Number: 9805B24-02	Reported: 05/28/98

QC Batch Number: GC0519980PCBEXZ
Instrument ID: GCHP12

Polychlorinated Biphenyls (EPA 8080)

Analyte	Detection Limit ug/L	Sample Results ug/L
PCB-1016	0.10	N.D.
PCB-1221	0.40	N.D.
PCB-1232	0.10	N.D.
PCB-1242	0.10	N.D.
PCB-1248	0.10	N.D.
PCB-1254	0.10	N.D.
PCB-1260	0.10	N.D.

Surrogates	Control Limits %		% Recovery
Dibutylchlorendate	50	150	109
Tetrachloro-m-xylene	50	150	44 Q

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Project Manager

Sequoia Analytical

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1455 McDowell Blvd. North, Ste. D, Petaluma, CA 94954, (707) 792-1865, FAX (707) 792-0342

Alta Geoscience	Client Proj. ID: Westinghouse, Emeryville	Sampled: 05/14/98
11711 Northcreek Parkway S.	Sample Descript: S-2R	Received: 05/15/98
Suite 101	Matrix: LIQUID	Extracted: 05/19/98
Bothell, WA 98011	Analysis Method: EPA 8080	Analyzed: 05/26/98
Attention: Alex Tula	Lab Number: 9805B24-03	Reported: 05/28/98

QC Batch Number: GC0519980PCBEXZ
Instrument ID: GCHP12

Polychlorinated Biphenyls (EPA 8080)

Analyte	Detection Limit ug/L	Sample Results ug/L
PCB-1016	0.10	N.D.
PCB-1221	0.40	N.D.
PCB-1232	0.10	N.D.
PCB-1242	0.10	N.D.
PCB-1248	0.10	N.D.
PCB-1254	0.10	N.D.
PCB-1260	0.10	N.D.

Surrogates	Control Limits %		% Recovery
Dibutylchlorendate	50	150	64
Tetrachloro-m-xylene	50	150	36 Q

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
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819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100
1455 McDowell Blvd. North, Ste. D, Petaluma, CA 94954, (707) 792-1865, FAX (707) 792-0342

Alta Geoscience
11711 Northcreek Parkway S.
Suite 101
Bothell, WA 98011
Attention: Alex Tula

Client Proj. ID: Westinghouse, Emeryville
Sample Descript: D-2R
Matrix: LIQUID
Analysis Method: EPA 8080
Lab Number: 9805B24-04

Sampled: 05/14/98
Received: 05/15/98
Extracted: 05/19/98
Analyzed: 05/26/98
Reported: 05/28/98

QC Batch Number: GC0519980PCBEXZ
Instrument ID: GCHP12

Polychlorinated Biphenyls (EPA 8080)

Analyte	Detection Limit ug/L	Sample Results ug/L
PCB-1016	0.10	N.D.
PCB-1221	0.40	N.D.
PCB-1232	0.10	N.D.
PCB-1242	0.10	N.D.
PCB-1248	0.10	N.D.
PCB-1254	0.10	N.D.
PCB-1260	0.10	N.D.

Surrogates	Control Limits %		% Recovery
Dibutylchlorendate	50	150	69
Tetrachloro-m-xylene	50	150	31 Q

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Project Manager

Sequoia Analytical

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1455 McDowell Blvd. North, Ste. D, Petaluma, CA 94954, (707) 792-1865, FAX (707) 792-0342

Alta Geoscience	Client Proj. ID: Westinghouse, Emeryville	Sampled: 05/14/98
11711 Northcreek Parkway S.	Sample Descript: S-3	Received: 05/15/98
Suite 101	Matrix: LIQUID	Extracted: 05/19/98
Bothell, WA 98011	Analysis Method: EPA 8080	Analyzed: 05/26/98
Attention: Alex Tula	Lab Number: 9805B24-05	Reported: 05/28/98

QC Batch Number: GC0519980PCBEXZ
Instrument ID: GCHP12

Polychlorinated Biphenyls (EPA 8080)

Analyte	Detection Limit ug/L	Sample Results ug/L
PCB-1016	0.10	N.D.
PCB-1221	0.40	N.D.
PCB-1232	0.10	N.D.
PCB-1242	0.10	N.D.
PCB-1248	0.10	N.D.
PCB-1254	0.10	N.D.
PCB-1260	**0.10**	**0.13**

Surrogates	Control Limits %		% Recovery
Dibutylchlorendate	50	150	77
Tetrachloro-m-xylene	50	150	43 Q

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
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819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100
1455 McDowell Blvd. North, Ste. D, Petaluma, CA 94954, (707) 792-1865, FAX (707) 792-0342

Alta Geoscience	Client Proj. ID: Westinghouse, Emeryville	Sampled: 05/14/98
11711 Northcreek Parkway S.	Sample Descript: D-3	Received: 05/15/98
Suite 101	Matrix: LIQUID	Extracted: 05/19/98
Bothell, WA 98011	Analysis Method: EPA 8080	Analyzed: 05/26/98
Attention: Alex Tula	Lab Number: 9805B24-06	Reported: 05/28/98

QC Batch Number: GC0519980PCBEXZ
Instrument ID: GCHP12

Polychlorinated Biphenyls (EPA 8080)

Analyte	Detection Limit ug/L	Sample Results ug/L
PCB-1016	0.10	N.D.
PCB-1221	0.40	N.D.
PCB-1232	0.10	N.D.
PCB-1242	0.10	N.D.
PCB-1248	0.10	N.D.
PCB-1254	0.10	N.D.
PCB-1260	0.10	N.D.

Surrogates	Control Limits %		% Recovery
Dibutylchlorendate	50	150	82
Tetrachloro-m-xylene	50	150	40 Q

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Project Manager

Sequoia Analytical

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1455 McDowell Blvd. North, Ste. D, Petaluma, CA 94954, (707) 792-1865, FAX (707) 792-0342

Alta Geoscience
11711 Northcreek Parkway S.
Suite 101
Bothell, WA 98011
Attention: Alex Tula

Client Proj. ID: Westinghouse, Emeryville
Sample Descript: S-4
Matrix: LIQUID
Analysis Method: EPA 8080
Lab Number: 9805B24-07

Sampled: 05/14/98
Received: 05/15/98
Extracted: 05/19/98
Analyzed: 05/26/98
Reported: 05/28/98

QC Batch Number: GC0519980PCBEXZ
Instrument ID: GCHP12

Polychlorinated Biphenyls (EPA 8080)

Analyte	Detection Limit ug/L	Sample Results ug/L
PCB-1016	0.10	N.D.
PCB-1221	0.40	N.D.
PCB-1232	0.10	N.D.
PCB-1242	0.10	N.D.
PCB-1248	0.10	N.D.
PCB-1254	0.10	N.D.
PCB-1260	0.10	N.D.

Surrogates	Control Limits %		% Recovery
Dibutylchlorendate	50	150	82
Tetrachloro-m-xylene	50	150	37 Q

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Project Manager

Sequoia Analytical

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819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100
1455 McDowell Blvd. North, Ste. D, Petaluma, CA 94954, (707) 792-1865, FAX (707) 792-0342

Alta Geoscience	Client Proj. ID: Westinghouse, Emeryville	Sampled: 05/14/98
11711 Northcreek Parkway S.	Sample Descript: D-4	Received: 05/15/98
Suite 101	Matrix: LIQUID	Extracted: 05/19/98
Bothell, WA 98011	Analysis Method: EPA 8080	Analyzed: 05/26/98
Attention: Alex Tula	Lab Number: 9805B24-08	Reported: 05/28/98

QC Batch Number: GC0519980PCBEXZ
Instrument ID: GCHP12

Polychlorinated Biphenyls (EPA 8080)

Analyte	Detection Limit ug/L	Sample Results ug/L
PCB-1016	0.10	N.D.
PCB-1221	0.40	N.D.
PCB-1232	0.10	N.D.
PCB-1242	0.10	N.D.
PCB-1248	0.10	N.D.
PCB-1254	0.10	N.D.
PCB-1260	0.10	N.D.

Surrogates	Control Limits %		% Recovery
Dibutylchlorendate	50	150	67
Tetrachloro-m-xylene	50	150	31 Q

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Project Manager

Sequoia Analytical

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819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100
1455 McDowell Blvd. North, Ste. D, Petaluma, CA 94954, (707) 792-1865, FAX (707) 792-0342

Alta Geoscience
11711 Northcreek Parkway S.
Suite 101
Bothell, WA 98011
Attention: Alex Tula

Client Proj. ID: Westinghouse, Emeryville
Sample Descript: S-5
Matrix: LIQUID
Analysis Method: EPA 8080
Lab Number: 9805B24-09

Sampled: 05/14/98
Received: 05/15/98
Extracted: 05/19/98
Analyzed: 05/27/98
Reported: 05/28/98

QC Batch Number: GC0519980PCBEXZ
Instrument ID: GCHP12

Polychlorinated Biphenyls (EPA 8080)

Analyte	Detection Limit ug/L	Sample Results ug/L
PCB-1016	0.10	N.D.
PCB-1221	0.40	N.D.
PCB-1232	0.10	N.D.
PCB-1242	0.10	N.D.
PCB-1248	0.10	N.D.
PCB-1254	0.10	N.D.
PCB-1260	**0.10**	**0.13**

Surrogates	Control Limits %		% Recovery
Dibutylchlorendate	50	150	91
Tetrachloro-m-xylene	50	150	45 Q

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Project Manager

Sequoia Analytical

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1455 McDowell Blvd. North, Ste. D, Petaluma, CA 94954, (707) 792-1865, FAX (707) 792-0342

Alta Geoscience	Client Proj. ID: Westinghouse, Emeryville	Sampled: 05/14/98
11711 Northcreek Parkway S.	Sample Descript: D-5	Received: 05/15/98
Suite 101	Matrix: LIQUID	Extracted: 05/19/98
Bothell, WA 98011	Analysis Method: EPA 8080	Analyzed: 05/27/98
Attention: Alex Tula	Lab Number: 9805B24-10	Reported: 05/28/98

QC Batch Number: GC0519980PCBEXZ
Instrument ID: GCHP12

Polychlorinated Biphenyls (EPA 8080)

Analyte	Detection Limit ug/L	Sample Results ug/L
PCB-1016	0.10	N.D.
PCB-1221	0.40	N.D.
PCB-1232	0.10	N.D.
PCB-1242	0.10	N.D.
PCB-1248	0.10	N.D.
PCB-1254	0.10	N.D.
PCB-1260	0.10	N.D.

Surrogates	Control Limits %		% Recovery
Dibutylchlorendate	50	150	108
Tetrachloro-m-xylene	50	150	45 Q

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Project Manager

Sequoia Analytical

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1455 McDowell Blvd. North, Ste. D, Petaluma, CA 94954, (707) 792-1865, FAX (707) 792-0342

Alta Geoscience	Client Proj. ID: Westinghouse, Emeryville	Sampled: 05/14/98
11711 Northcreek Parkway S.	Sample Descript: S-6	Received: 05/15/98
Suite 101	Matrix: LIQUID	Extracted: 05/19/98
Bothell, WA 98011	Analysis Method: EPA 8080	Analyzed: 05/27/98
Attention: Alex Tula	Lab Number: 9805B24-11	Reported: 05/28/98

QC Batch Number: GC0519980PCBEXZ
Instrument ID: GCHP12

Polychlorinated Biphenyls (EPA 8080)

Analyte	Detection Limit ug/L	Sample Results ug/L
PCB-1016	0.10	N.D.
PCB-1221	0.40	N.D.
PCB-1232	0.10	N.D.
PCB-1242	0.10	N.D.
PCB-1248	0.10	N.D.
PCB-1254	0.10	N.D.
PCB-1260	0.10	N.D.

Surrogates	Control Limits %		% Recovery
Dibutylchlorendate	50	150	76
Tetrachloro-m-xylene	50	150	34 Q

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Project Manager

Sequoia Analytical

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1455 McDowell Blvd. North, Ste. D, Petaluma, CA 94954, (707) 792-1865, FAX (707) 792-0342

Alta Geoscience	Client Proj. ID: Westinghouse, Emeryville	Sampled: 05/14/98
11711 Northcreek Parkway S.	Sample Descript: D-6	Received: 05/15/98
Suite 101	Matrix: LIQUID	Extracted: 05/19/98
Bothell, WA 98011	Analysis Method: EPA 8080	Analyzed: 05/27/98
Attention: Alex Tula	Lab Number: 9805B24-12	Reported: 05/28/98

QC Batch Number: GC0519980PCBEXZ
Instrument ID: GCHP12

Polychlorinated Biphenyls (EPA 8080)

Analyte	Detection Limit ug/L	Sample Results ug/L
PCB-1016	0.10	N.D.
PCB-1221	0.40	N.D.
PCB-1232	0.10	N.D.
PCB-1242	0.10	N.D.
PCB-1248	0.10	N.D.
PCB-1254	0.10	N.D.
PCB-1260	0.10	N.D.

Surrogates	Control Limits %		% Recovery
Dibutylchlorendate	50	150	100
Tetrachloro-m-xylene	50	150	44 Q

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Project Manager

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Alta Geoscience	Client Proj. ID: Westinghouse, Emeryville	Sampled: 05/14/98
11711 Northcreek Parkway S.	Sample Descript: S-7	Received: 05/15/98
Suite 101	Matrix: LIQUID	Extracted: 05/19/98
Bothell, WA 98011	Analysis Method: EPA 8080	Analyzed: 05/27/98
Attention: Alex Tula	Lab Number: 9805B24-13	Reported: 05/28/98

QC Batch Number: GC0519980PCBEXZ
Instrument ID: GCHP12

Polychlorinated Biphenyls (EPA 8080)

Analyte	Detection Limit ug/L	Sample Results ug/L
PCB-1016	0.10	N.D.
PCB-1221	0.40	N.D.
PCB-1232	0.10	N.D.
PCB-1242	0.10	N.D.
PCB-1248	0.10	N.D.
PCB-1254	0.10	N.D.
PCB-1260	0.10	N.D.

Surrogates	Control Limits %		% Recovery
Dibutylchlorendate	50	150	102
Tetrachloro-m-xylene	50	150	41 Q

Analytes reported as N.D. were not present above the stated limit of detection.

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Alta Geoscience	Client Proj. ID: Westinghouse, Emeryville	Sampled: 05/14/98
11711 Northcreek Parkway S.	Sample Descript: S-8	Received: 05/15/98
Suite 101	Matrix: LIQUID	Extracted: 05/19/98
Bothell, WA 98011	Analysis Method: EPA 8080	Analyzed: 05/27/98
Attention: Alex Tula	Lab Number: 9805B24-14	Reported: 05/28/98

QC Batch Number: GC0519980PCBEXZ
Instrument ID: GCHP12

Polychlorinated Biphenyls (EPA 8080)

Analyte	Detection Limit ug/L	Sample Results ug/L
PCB-1016	0.10	N.D.
PCB-1221	0.40	N.D.
PCB-1232	0.10	N.D.
PCB-1242	0.10	N.D.
PCB-1248	0.10	N.D.
PCB-1254	0.10	N.D.
PCB-1260	0.10	N.D.

Surrogates	Control Limits %		% Recovery
Dibutylchlorendate	50	150	98
Tetrachloro-m-xylene	50	150	36 Q

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

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Alta Geoscience	Client Proj. ID: Westinghouse, Emeryville	Sampled: 05/14/98
11711 Northcreek Parkway S.	Sample Descript: DUPL-1	Received: 05/15/98
Suite 101	Matrix: LIQUID	Extracted: 05/19/98
Bothell, WA 98011	Analysis Method: EPA 8080	Analyzed: 05/27/98
Attention: Alex Tula	Lab Number: 9805B24-15	Reported: 05/28/98

QC Batch Number: GC0519980PCBEXZ
Instrument ID: GCHP12

Polychlorinated Biphenyls (EPA 8080)

Analyte	Detection Limit ug/L	Sample Results ug/L
PCB-1016	0.10	N.D.
PCB-1221	0.40	N.D.
PCB-1232	0.10	N.D.
PCB-1242	0.10	N.D.
PCB-1248	0.10	N.D.
PCB-1254	0.10	N.D.
PCB-1260	0.10	N.D.

Surrogates	Control Limits %		% Recovery
Dibutylchlorendate	50	150	96
Tetrachloro-m-xylene	50	150	38 Q

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Project Manager

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1455 McDowell Blvd. North, Ste. D, Petaluma, CA 94954, (707) 792-1865, FAX (707) 792-0342

Alta Geoscience	Client Proj. ID: Westinghouse, Emeryville	Sampled: 05/14/98
11711 Northcreek Parkway S.	Sample Descript: FB-1	Received: 05/15/98
Suite 101	Matrix: LIQUID	Extracted: 05/19/98
Bothell, WA 98011	Analysis Method: EPA 8080	Analyzed: 05/27/98
Attention: Alex Tula	Lab Number: 9805B24-16	Reported: 05/28/98

QC Batch Number: GC0519980PCBEXZ
Instrument ID: GCHP12

Polychlorinated Biphenyls (EPA 8080)

Analyte	Detection Limit ug/L	Sample Results ug/L
PCB-1016	0.10	N.D.
PCB-1221	0.40	N.D.
PCB-1232	0.10	N.D.
PCB-1242	0.10	N.D.
PCB-1248	0.10	N.D.
PCB-1254	0.10	N.D.
PCB-1260	0.10	N.D.

Surrogates	Control Limits %		% Recovery
Dibutylchlorendate	50	150	93
Tetrachloro-m-xylene	50	150	34 Q

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Project Manager

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Alta Geoscience
11711 Northcreek Parkway S, #101
Bothell, WA 98011
Attention: Alex Tula

Client Project ID: Westinghouse, Emeryville
Matrix: Liquid
Work Order #: 9805B24 -01-16

Reported: Jun 4, 1998

QUALITY CONTROL DATA REPORT

Analyte:	PCB 1260
QC Batch#:	GC0519980PCBEXZ
Analy. Method:	EPA 8080
Prep. Method:	EPA 3520
Analyst:	S. Toyoda
LCS/LCSD #:	BLK051998
Sample Conc.:	N.D.
Prepared Date:	5/19/98
Analyzed Date:	5/26/98
Instrument I.D.#:	GCHP12
Conc. Spiked:	1.25 µg/L
Result:	1.2
LCS % Recovery:	96
Dup. Result:	1.2
LCSD % Recov.:	96
RPD:	0.0
RPD Limit:	0-50

LCS #:	
Prepared Date:	
Analyzed Date:	
Instrument I.D.#:	
Conc. Spiked:	
LCS Result:	
LCS % Recov.:	

MS/MSD	40-140
LCS	40-140
Control Limits	

SEQUOIA ANALYTICAL

Kayvan Kimyai
Project Manager

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

** MS = Matrix Spike, MSD = MS Duplicate, RPD = Relative % Difference

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Alta Geoscience
11711 Northcreek Parkway S.
Suite 101
Attention: Alex Tula

Client Proj. ID: Westinghouse, Emeryville

Lab Proj. ID: 9805B24

Received: 05/15/98

Reported: 05/28/98

LABORATORY NARRATIVE

In order to properly interpret this report, it must be reproduced in its entirety. This report contains a total of 20 pages including the laboratory narrative, sample results, quality control, and related documents as required (cover page, COC, raw data, etc.).

SEQUOIA ANALYTICAL

Project Manager

SEQUOIA ANALYTICAL
CHAIN OF CUSTODY

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Company Name: ALTA GEOSCIENCES	Project Name: WESTINGHOUSE, EMERYVILLE
Address: 11711 NORTHCREEK PARKWAY SOUTH, SUITE 101	Billing Address (if different):
City: BOTHELL State: WA Zip Code: 98011	
Telephone: 425 485 1053 FAX #: 425 486 7651	P.O. #:
Report To: ALEX TULA Sampler: DAVID COOPER	QC Data: ❑ Level D (Standard) ❑ Level C ❑ Level B ❑ Level A

Turnaround Time: ☒ 10 Working Days ❑ 3 Working Days ❑ 2 - 8 Hours ❑ 7 Working Days ❑ 2 Working Days ❑ 5 Working Days ❑ 24 Hours

❑ Drinking Water ❑ Waste Water ❑ Other

Analyses Requested 980 5B24

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Sequoia's Sample #	8080 PCB'S								Comments
1. S-1	5/14/98 1230	WATER	2	1 LITER	1	X								0.1 ug/l DETECTION LIMIT ALL SAMPLES
2. D-1	1300				2	X								
3. S-2R	1400				3	X								
4. D-2R	1300				4	X								
5. S-3	1530				5	X								
6. D-3	1430				6	X								
7. S-4	1030				7	X								
8. D-4	0930				8	X								
9. S-5	0900		4		9	X								MS/MSD
10. D-5	0800		2		10	X								

Relinquished By: D. Cooper	Date: 5/15/98	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By Lab: Terri Dunno	Date: 5/15/98	Time: 1300

Were Samples Received in Good Condition? ❑ Yes ❑ No Samples on Ice? ❑ Yes ❑ No Method of Shipment______________

Pink - Client Yellow - Sequoia White - Sequoia

SEQUOIA ANALYTICAL
CHAIN OF CUSTODY

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❑ 404 N. Wiget Lane • Walnut Creek, CA 94598 • (510) 988-9600 FAX (510) 988-9673

Company Name: ALTA GEOSCIENCES	Project Name: WESTINGHOUSE, EMERYVILLE
Address:	Billing Address (if different):
City: State: Zip Code:	
Telephone: 425 485 1053 FAX #: 486 7657	P.O. #:
Report To: ALEX TULA Sampler: DAVID COOPER	QC Data: ❑ Level D (Standard) ❑ Level C ❑ Level B ❑ Level A

Turnaround Time: ❑ 10 Working Days ❑ 3 Working Days ❑ 2 - 8 Hours ❑ 7 Working Days ❑ 2 Working Days ❑ 5 Working Days ❑ 24 Hours

❑ Drinking Water ❑ Waste Water ❑ Other

Analyses Requested

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Sequoia's Sample #	BOD	TSS	Comments
1. S-6	5/14/98 1720	WATER	2	1 LITER	11	X		0.1 ug/l DETECTION LIMIT
2. D-6	1630				12	X		
3. S-7	1100				13	X		
4. S-8	1700				14	X		
5. DUP-1	0801				15	X		
6. FB-1	1115				16	X		
7.								
8.								
9.								
10.								

Relinquished By:	Date: 5/15/98	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By Lab:	Date: 5/15/98	Time: 1350

Were Samples Received in Good Condition? ❑ Yes ❑ No Samples on Ice? ❑ Yes ❑ No Method of Shipment_____

Pink - Client
Yellow - Sequoia
White - Sequoia

APPENDIX C
DATA QUALITY ASSURANCE REVIEW

GROUNDWATER SAMPLES: POLYCHLORINATED BIPHENYLS (PCBs) DATA QUALITY ASSURANCE REVIEW (SEQUOIA I.D. # 9805B24-01 to 16)

Upon receipt from Sequoia Analytical (SA) laboratory, all PCB analytical results underwent a Quality Assurance (QA) review of laboratory handling procedures. In addition to sample results, the laboratory data reports included Quality Control (QC) data for blank, laboratory control sample (i.e., blank spike), surrogate, matrix spike, and matrix spike duplicate results.

SAMPLE ANALYSIS

SA performed PCB analyses using EPA Test Method 8080 as promulgated in *Test Methods for Evaluating Solid Waste, USEPA SW846, 3rd Edition, 1994* (SW846).

HOLDING TIMES

Holding times for 16 groundwater samples were assessed relative to the following SW846 holding times:

- A sample must be extracted within seven days from the date and time of sample collection;
- A sample must be analyzed within 40 days from the date of extraction; and
- All samples must be shipped in an iced chest to the laboratory and stored at 4°C until they are extracted.

Fifteen groundwater samples were collected May 13, 1998. SA received the samples on May 15, 1998. All samples were shipped in an iced chest and were stored at 4°C until extraction. SA extracted the samples on May 19, 1998. Samples were analyzed on May 26, and 27, 1998. All holding times are acceptable.

BLANK ANALYSIS

Method blank analysis is performed to determine the extent of laboratory contamination of samples. Method blank criteria require that no PCBs be detected in the blank.

Two method blanks were analyzed. PCBs were not detected in the blanks.

ACCURACY

Accuracy was assessed by evaluating surrogates, blank spikes, and matrix spike recoveries. Each sample and QC sample is spiked with a surrogate compound. Each matrix spike (MS) and matrix spike duplicate (MSD) is prepared by spiking a groundwater sample with a known concentration of Aroclor 1260 (A1260). A blank spike (BS) is prepared by spiking a laboratory-prepared aqueous sample with a known concentration of A1260.

Surrogate Recovery

Groundwater samples were spiked with two surrogate compounds: dibutylchlorendate (DBC) and tetrachlor-m-xylene (TCMX). The project QC limits for percent surrogate recovery (%R) of DBC and TCMX are 50% to 150%.

DBC %Rs ranged from 64% to 108% with a mean of 88% and standard deviation of 15%. All %Rs were acceptable.

TCMX %Rs ranged from 31% to 45% with a mean of 39% and standard deviation of 5%. TCMX %Rs were outside QC limits for all samples analyzed.

Action

Based on TCMX recoveries, results for some early eluting aroclors, such as A1016 and A1221, may be biased low. One explanation for the loss of TCMX is that the surrogate, which is a volatile compound, was purged from the extract during the boil-down phase of the sample extraction procedure. However, since DBC recoveries (the late eluting surrogate) were acceptable, and A1260 is the only Aroclor of concern, no action is required.

Matrix Spike Recovery

The laboratory prepared one MS and one MSD with the data set (i.e., project sample S-5). The project required MS %R QC limit for A1260 is 40% to 140%. The %R for the MS was reported by the laboratory as 96%. The %R is acceptable.

PRECISION

Precision is expressed as the relative percent difference (RPD) between the MS and the MSD. The project required MS/MSD RPD control limit for A1260 is 50%.

The RPD was reported by the laboratory as 0.0%. The RPD is acceptable.

COMPOUND IDENTIFICATION

PCBs were detected using a gas chromatograph equipped with an electron capture detector (ECD). The identity of a detected compound was determined by comparison of a standard's retention times and its chromatographic trace with that of the sample detected compound.

The required detection limits for all aroclors was 0.10 µg/L. This was attained for all aroclors except A1221, which had a detection limit of 0.4 µg/L throughout. It is likely this higher detection level was required because of sample matrix interferences and the necessity for greater sample dilution. Since A1260 is the only Aroclor of concern, no action is required.

COMPLETENESS

Completeness is a measure of the amount of valid sample data obtained from the measurement system compared to the amount of sample data that were analyzed. Valid results are those results which meet or exceed quality control criteria and satisfy quality assurance objectives. The percent completeness is compared to a goal of 80%.

Completeness for the data set was 100%. The completeness is acceptable.