QUARTERLY GROUNDWATER MONITORING RESULTS, SEPTEMBER-OCTOBER, 1997

at the:

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)
JET PROPULSION LABORATORY
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March, 1998

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March 19, 1998
FWCM-98-233-01

Mr. Chuck Buril
Manager, Environmental Affairs office
Jet Propulsion Laboratory
M/S 171-225
4800 Oak Grove Drive
Pasadena, CA 91109

Subject: Report on Quarterly Groundwater Monitoring Results, September-October, 1997, Jet Propulsion Laboratory

Dear Chuck:

Per your request, enclosed are nine copies of the subject report.

This is for the fifth long-term quarterly groundwater sampling event required of Contract Work Orders (CWOs) 233 and 234 of Contract No. 658677. With this report, the requirements of CWOs 223 and 234 have been fulfilled.

If you have any questions, or need further information, please let us know.

Sincerely,
Foster Wheeler Environmental Corporation

Mark Losi

Mark Losi, Ph. D.
Environmental Scientist

Mark Cutler

Mark Cutler, R.G., C.HG.
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EXECUTIVE SUMMARY

Presented in this report are the results of the fifth long-term groundwater monitoring event (September-October, 1997) of the Comprehensive Environmental Response, Compensation and Liability Act Remedial Investigation/Feasibility Study at the NASA-Jet Propulsion Laboratory (JPL). This event is part of the long-term quarterly groundwater monitoring program that was initiated in response to requests from the United States Environmental Protection Agency.

Between September 12 and October 29, 1997, groundwater samples were collected from JPL monitoring wells (both on- and off-site) and analyzed for volatile organic compounds (VOCs), metals (arsenic, lead, total chromium, and hexavalent chromium), perchlorate, and major anions/cations. In addition, analysis for tributyltin was performed on a sample from well MW-8.

Results indicated that only three VOCs (carbon tetrachloride, trichloroethene, and 1,2-dichloroethane) were detected in concentrations above state or federal Maximum Contaminant Levels (MCLs) for drinking water. Perchlorate was detected in 6 wells above its interim action level of 18 μg/l. Tributyltin was not detected and hexavalent chromium was found in two wells. To date, an MCL has not been established for hexavalent chromium. Arsenic and lead were not detected at concentrations above their MCLs. Total chromium was detected above its MCL in one well. A summary of the sampling procedure is included in Section 2.0 and a summary of the analytical results is included in Section 3.0.

Results from major anion/cation analyses (water chemistry) were used to identify the general water types beneath JPL during this sampling event. These results are presented in Section 4.0. Water-level measurements, recorded before and after sampling activities, are presented in Section 5.0.

1.0 INTRODUCTION

This report summarizes the results from the fifth sampling event of the long-term quarterly groundwater monitoring program currently being conducted at the NASA-Jet Propulsion Laboratory (JPL). The purpose of the program is to monitor the elevation, flow direction, and quality of the groundwater beneath and adjacent to the JPL site and to generate data for the JPL Comprehensive Environmental Response, Compensation and Liability Act Remedial Investigation/Feasibility Study. From September 12 to October 29, 1997, Foster Wheeler Environmental Corporation (Foster Wheeler) personnel sampled the JPL monitoring wells (both on- and off-site). In addition, water level measurements at each well were taken prior to (September 9, 1997), and after sampling (October 29, 1997).

The locations of the JPL groundwater monitoring wells are shown in Figure 1-1. Monitoring wells MW-3, MW-4, MW-11, MW-12, MW-14, and MW-17 through MW-24 are deep, multi-port (MP) wells, each containing five screened intervals within a Westbay Instruments, Inc. (Westbay) multi-port casing system. Monitoring wells MW-1, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-13, MW-15, and MW-16 are relatively shallow standpipe wells, each containing a single screened interval located just below the water table. Monitoring well MW-2 has been replaced with well MW-14 (Figure 1-1) as a JPL sampling point. A summary of the well construction details for the JPL groundwater monitoring wells is included in Table 1-1. During this event, one shallow well (MW-16) and screen 1 of deep, multi-port wells MW-12, MW-18, MW-20 and MW-21 could not be sampled due to depressed water levels.

All of the groundwater samples collected at JPL were taken to Montgomery Watson Laboratories in Pasadena, California, for chemical analysis. Montgomery Watson Laboratories is certified by the California Department of Health Services. The following analyses were performed.

Analysis	EPA Method
Volatile Organic Compounds (all wells)	524.2
Total Chromium (all wells)	200.8
Hexavalent Chromium (all wells)	7196
Total Lead (all wells)	200.8
Total Arsenic (all wells)	200.9
Major Cations and Major Anions (all wells)	Various
Perchlorate (all wells)	300.0, modified
Tributyltin (well MW-8)	GC/FPD

In addition to groundwater samples, field quality assurance/quality control (QA/QC) samples, including trip blanks, equipment blanks, etc., were collected for laboratory analysis. Sampling records for each shallow well are included in Appendix A, and sampling records and piezometric pressure profiling records for each deep multi-port well are included in Appendix B. Field instrument calibration forms are included in Appendix C, and laboratory analytical reports and associated chain-of-custody forms are included in Appendix D.

2.0 SAMPLING AND FIELD QUALITY ASSURANCE/ QUALITY CONTROL PROCEDURES

Two different procedures were used in collection and handling of groundwater samples at JPL, one designed for the shallow wells and the other for the deep multi-port wells. These procedures are outlined below.

2.1 SHALLOW MONITORING WELLS

The sampling procedure described below was applied to all the JPL shallow monitoring wells, which includes wells MW-1, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-13, and MW-15 (MW-16 could not be sampled due to depressed water level).

The primary equipment used to sample the shallow wells included a dedicated 2-inch Grundfos Redi-Flo2® pump, a pump controller, and a 220-volt generator. All of the dedicated 2-inch Grundfos Redi-Flo2® pump systems were decontaminated prior to their installation before the beginning of the long-term quarterly monitoring program. Details of decontamination procedures for the Grundfos Redi-Flo2® pump systems are outlined in a previous document (Ebasco, 1993a).

Prior to sample collection, the water in each well casing was purged (by pumping) to remove groundwater that may have been exposed to the atmosphere and thus is not representative of undisturbed aquifer conditions. This purged groundwater was discharged into 500- or 1,000-gallon polyethylene storage tanks for disposal by JPL personnel pursuant to Environmental Protection Agency (EPA) guidance on the management of investigation-derived wastes (EPA, 1991 and 1992).

Temperature, pH, electrical conductivity and turbidity of the water removed from each well were monitored during purging. After these parameters had stabilized (when two successive measurements made approximately 3 minutes apart were within approximately 10 percent of each other) and the turbidity was less than 5 Nephelometric Turbidity Units, the groundwater samples were collected with the dedicated pump. During sampling for volatile organic compounds (VOCs), the pump rate was reduced to approximately 0.02 gallons per minute to minimize sample agitation. All information concerning sampling was noted on the Well Development/Well Sampling Log Forms included in Appendix A.

All sample bottles were filled completely (though not allowed to overflow), capped, labeled, and placed in a cooler with ice immediately after sample collection. Samples collected for VOCs had zero headspace.

Calibration, or standardization, of the field instruments used to measure temperature, pH, conductivity, and turbidity, was performed to the manufacturer's specifications at the beginning and end of each sampling day. Field instrument calibration forms are included in Appendix C.

2.2 DEEP MULTI-PORT MONITORING WELLS

Sampling of the deep JPL multi-port (MP) monitoring wells required specialized sampling equipment manufactured by Westbay. This equipment included a pressure profiling/sampling probe with a surface control unit. Field personnel using this equipment were trained by Westbay personnel to ensure proper use. Copies of the detailed operations manuals for the Westbay pressure profiling/sampling probe are included in the OU-1 and OU-3 Field Sampling and Analysis Plans (Ebasco, 1993a; 1994).

The Westbay sampling probe and sample bottles were decontaminated prior to sampling each screened interval in the deep MP wells according to the following procedures:

- Wash each 250-ml stainless steel sample bottle in a solution of non-phosphate detergent (Liquinox®) and distilled water followed by washing each bottle in a solution of an acidic detergent (Citranox®) and distilled water.
- Rinse each bottle twice with deionized water.
- The interior surfaces of the Westbay sampling probe, and the hoses and valves associated with the Westbay sample bottles, were decontaminated by forcing several volumes of a solution of Liquinox® and distilled water through them followed by forcing several volumes of a Citranox® and distilled water solution through them. A final rinse with deionized water was carried out. Each of these decontamination procedures was completed using a clean plastic squeeze bottle used only for this purpose.

Purging before sampling is not required in the deep MP monitoring wells because the groundwater sample is collected directly from the aquifer, and is not exposed to the atmosphere. However, at each screened interval an initial sample was collected in order to check pH, conductivity, temperature, and turbidity in the field, and to rinse the sampling container with formation water. Samples for laboratory analysis were then collected and transferred to bottles as described above (final paragraph in Section 2.1). A final sample was collected and analyzed for pH, conductivity, temperature, and turbidity to ensure continuity of aquifer conditions during sampling. Results of the field analyses were recorded on well development logs, which are included in Appendix B. Calibration and maintenance of field instruments were carried out according to procedures described previously (Ebasco, 1993a; 1994).

2.3 FIELD QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

To verify the quality of the groundwater samples collected from the JPL monitoring wells, field QA/QC samples were collected. The field QA/QC program included the collection of duplicate

samples, equipment blanks and trip blanks. In addition, laboratory QA/QC samples were used by the laboratory according to analytical method requirements.

Duplicate samples for VOCs, metals and perchlorate (ClO_4) analyses were collected from shallow groundwater monitoring wells MW-10 and MW-13, and deep MP well MW-4 (screen 2). In addition, after every 10 samples that were collected for VOC analyses, a matrix spike (MS) sample and a matrix spike duplicate (MSD) sample were collected and submitted to the laboratory for the laboratory's use in verifying the accuracy of the analytical method. Similarly, after every 10 samples that were collected for metals analyses, a MS/MSD sample was collected and submitted to the laboratory for their use.

One equipment blank sample was collected from the Westbay sample bottles during each day of sampling the deep MP wells. Equipment blanks were collected by passing American Society of Testing Materials (ASTM) Type II organic free water (provided by the laboratory) through the sampling equipment as a final rinse after the equipment had been decontaminated. This equipment blank was analyzed for the same constituents as the groundwater samples to identify potential cross contamination due to inadequate decontamination procedures. Equipment blanks were not collected during sampling of the shallow wells as dedicated sampling equipment was used.

A trip blank, consisting of ASTM Type II water placed in two 40-ml glass vials by the laboratory, was transported with the empty sample bottles to the field and back to the laboratory with the groundwater samples. One trip blank was submitted for VOC analysis with each shipment of groundwater samples. Trip blanks were used to identify potential cross contamination of groundwater samples during transport.

3.0 ANALYTICAL RESULTS

JPL groundwater monitoring wells MW-1, and MW-3 through MW-24 were sampled between September 12 and October 29, 1997 with the following exceptions: MW-16 and screen 1 of MW-12, MW-18, MW-20 and MW-21. These wells could not be sampled because water levels were below their respective screened intervals. MW-2 was not sampled as it was replaced as a JPL monitoring point by deep multi-port well MW-14.

The groundwater samples were analyzed for VOCs, total chromium (Cr), hexavalent chromium (Cr^{6+}), total lead (Pb), total arsenic (As), ClO_4 and tributyltin (TBT) (MW-8 only). All samples were also analyzed for general water chemistry parameters that included major cations and anions [sodium (Na), potassium (K), calcium (Ca), magnesium (Mg), iron (Fe), alkalinity (CO_3^+ HCO_3), chloride (Cl), sulfate (SO_4), nitrate (NO_3)], total dissolved solids (TDS), specific conductivity and pH. A summary of the samples collected, sample numbers used, and the analyses performed on each sample is presented in Table 3-1. Analytical laboratory reports and associated chain-of-custody forms are included in Appendix D.

3.1 VOLATILE ORGANIC COMPOUNDS RESULTS

Groundwater samples collected during the September-October 1997 sampling event were analyzed for over 60 different VOCs in accordance with EPA Method 524.2. To present the results from the multiport wells with concentration contour maps, the JPL aquifer was divided into four (4) aquifer layers based on correlations interpreted from lithologic cross sections. Listed in Table 3-2 are the JPL monitoring well screens and their corresponding aquifer layers. Results of the analyses for VOCs in the September-October 1997 samples are summarized in Table 3-3 along with the Maximum Contaminant Levels (MCLs) for drinking water as listed in Title 22 of the California Code of Regulations and in the EPA Health Advisory Guidelines. A small number of compounds were detected in these samples, and only three VOCs [carbon tetrachloride (CCl_4), trichloroethene (TCE), and 1,2-dichloroethane (1,2-DCA)] were found in concentrations exceeding state and/or federal MCLs (Table 3-3). The concentrations of CCl_4, TCE, and 1,2-DCA detected in each aquifer layer are contoured on maps to better present the spatial distribution of each constituent. In addition, contour maps of tetrachloroethene (PCE) concentrations are also included. Where a constituent was not detected in a particular aquifer layer, a contour map was not prepared for that layer. Carbon tetrachloride detected in aquifer layers 1, 2 and 3 are contoured in Figures 3-1, 3-2 and 3-3, respectively. Figures 3-4, 3-5 and 3-6 include contours of TCE concentrations detected in layers 1, 2 and 3, respectively, and Figure 3-7 contains contours of 1,2-DCA concentrations detected in aquifer layer 1. Figures 3-8, 3-9 and 3-10 include contours of PCE detected in aquifer layers 1, 2 and 3. Only concentrations exceeding MCLs are

contoured with the exception of PCE, which was not detected above its MCLs and is therefore contoured to its detection limit (0.5 µg/l). A summary of VOC results collected during all five of the long-term quarterly sampling events completed to date is provided in Table 3-4.

CCl_4 in excess of the state MCL (0.5 µg/l) was found in eight of the on-site wells, and two of the off-site wells (Table 3-3, Figures 3-1, 3-2 and 3-3). The federal MCL (5.0 µg/l) was exceeded in four on-site wells and one off-site well. The highest concentration of CCl_4 was found in shallow on-site well MW-7.

TCE in excess of the state and federal MCL (5.0 µg/l) was detected in four on-site wells, and one off-site well (Table 3-3, Figures 3-4, 3-5, and 3-6). The highest levels of TCE were found in shallow on-site wells MW-7 and MW-13.

1,2-DCA concentrations above the state MCL (0.5 µg/l) were found in two on-site wells (Table 3-3 and Figure 3-7). 1,2-DCA was not detected above the state MCL in any of the off-site wells, and the federal MCL (5.0 µg/l) was not exceeded in any of the wells.

PCE was detected in six on-site wells and four off-site wells, although not at concentrations exceeding the state and federal MCL (5.0 µg/l) (Figures 3-8, 3-9 and 3-10).

3.2 PERCHLORATE RESULTS

Perchlorate analyses were conducted on groundwater samples from the September-October 1997 event by ion chromatography (EPA 300.0, modified). Results are included in Table 3-3. No MCLs for ClO_4 have been established to date. Perchlorate was detected in a total of 14 wells (Table 3-3), of which 6 exceeded the interim action level (18 µg/l). Perchlorate concentrations exceeding the interim action level are contoured in Figures 3-11 and 3-12 for aquifer layers 1 and 2, respectively. Perchlorate was not detected above the interim action level in aquifer layers 3 and 4. The highest ClO_4 levels were observed on-site in shallow wells MW-7, MW-13, and screens 1 and 2 of MP well MW-24.

3.3 TRIBUTYLTIN RESULTS

Analysis for TBT was performed on the groundwater sample collected from shallow well MW-8. This analysis was conducted because TBT has historically been used as an anti-foulant in cooling towers such as those in use at JPL. Well MW-8 was selected for sampling by the Department of Toxic Substances Control because it is located downgradient of potential TBT releases.

TBT was not detected in the groundwater sample from MW-8.

3.4 METALS RESULTS

Groundwater samples from the September-October 1997 sampling event were analyzed for the following suite of metals: total As, total Pb, total Cr, and Cr^{6+}. The results of these analyses are summarized in Table 3-5.

Total As was detected in only one well (MW-3 screen 5) at a concentration below the state and federal MCL (0.05 mg/l). Total Pb was not detected in any well. Total Cr was detected in two wells (MW-4 screen 2 and MW-7) at concentrations below state and federal MCLs (0.05 and 0.10 mg/l, respectively) and in one well above the state MCL (MW-13). Hexavalent chromium was detected in on-site shallow well MW-13 and off-site well MW-17 screen 3. At this time, state or federal agencies have not established an MCL for Cr^{6+}.

Table 3-6 contains a summary of metals data from all five long-term quarterly sampling events completed to date.

3.5 QUALITY ASSURANCE/QUALITY CONTROL RESULTS

Review of the QA/QC data provided with the laboratory analytical results (Appendix D) indicates that results obtained from September-October 1997 samples are acceptable for their intended use of characterizing aquifer quality. Surrogate compound, matrix and blank spike, and method blank results were used by the laboratory to determine the accuracy and precision of the analytical techniques and to identify anomalous results due to laboratory contamination or instrument malfunction.

In addition to laboratory QA/QC samples, Foster Wheeler personnel collected QA/QC samples in the field. These samples included duplicate samples, equipment blanks, and trip blanks.

Duplicate samples were used as an independent means of evaluating the precision of the laboratory analyses. Duplicate groundwater samples for VOCs, ClO_4 and metals analyses were collected from MW-4 (screen 2), MW-10, and MW-13. All of the analytical results for the duplicate samples were similar to the results of the original groundwater samples (Table 3-3 and Table 3-5).

Twenty-three equipment blanks (EBs) were submitted for analysis during the September-October 1997 sampling event. Chloroform was found in 22 of them at levels slightly above the detection limit, and dichloromethane was found in 2 others. Dichloromethane was not detected in the associated groundwater samples, therefore it does not reflect cross-contamination of samples through the sampling equipment. Since none of the laboratory method blanks contained chloroform, some of the observed levels of chloroform in the EBs may have resulted from impurities in the distilled water used for decontamination. However, low levels of chloroform were found in approximately 45% of the deep well groundwater samples, and at the same time found in

approximately 45% of shallow well samples. The shallow wells were sampled using dedicated sampling equipment, which are not subject to quarterly decontamination procedures, suggesting the chloroform results may be representative of aquifer conditions.

Total chromium was detected in one equipment blank, but not in any associated groundwater samples. Two of the equipment blanks also contained minor amounts of unidentifiable organic compounds. None of the compounds (identified only by retention time) were found in any groundwater samples.

A total of 26 trip blanks were also submitted along with the September-October 1997 groundwater samples. One trip blank contained low concentrations (1.5-2.5 µg/l) of an ethylmethylbenzene isomer, xylene and toluene. None of these compounds were detected in associated groundwater samples. Three trip blanks also contained small quantities of unidentifiable organic compounds, none of which were detected in groundwater samples. Based on these results, there was no cross-contamination of samples during transportation to the laboratory.

4.0 GENERAL WATER CHEMISTRY

As part of this groundwater monitoring event, groundwater samples were submitted for analysis of major cations and anions in an effort to further understand the natural water chemistry of the groundwater beneath JPL. Samples from each of the JPL shallow monitoring wells, and each of the deep MP wells, were analyzed for major cations (Ca, Fe, Mg, Na, and K), major anions (Cl, SO_4, NO_3, CO_3 + HCO_3), pH, and TDS. The water chemistry results for this quarterly sampling event are summarized in Table 4-1.

4.1 ANALYTICAL RESULTS

To illustrate the relative proportions of the major cations and anions in each groundwater sample, the water chemistry results from the September-October 1997 event have been compiled as Stiff diagrams (Figures 4-1, 4-2 and 4-3). Review of the water chemistry data from this investigation indicates that the majority of groundwater sampled at JPL can be classified as one of four general types, based on the predominant cation and anion, and the occurrence of other ions. These general water types include:

Type 1. Calcium-bicarbonate groundwater. Groundwater with Ca as the dominant cation and HCO_3 as the dominant anion.

Type 2. Sodium-bicarbonate groundwater. Groundwater with Na as the dominant cation and HCO_3 as the dominant anion.

Type 3. Calcium-bicarbonate/chloride/sulfate groundwater. Groundwater with Ca as the dominant cation and HCO_3 as the dominant anion, but with relatively elevated Cl and SO_4 concentrations.

Type 4. Calcium/sodium-bicarbonate groundwater. Groundwater with Ca as the dominant cation, but with relatively elevated Na concentrations and HCO_3 as the dominant anion. This water type likely represents a blend of Types 1 and 2.

Based on this scheme, waters classified as Type 1 and Type 3 are very similar in that both types contain calcium as the predominant cation and bicarbonate as the predominant anion. Type 3 and Type 4 groundwaters, however, contain slightly higher concentrations of chloride and sulfate, or sodium ions, respectively, relative to those of Type 1. Other potential mixtures of the first three water types include Type 5 (a mixture of Types 1 and 3) and Type 6 (a mixture of Types 2 and 3).

All of the shallow wells contained calcium-bicarbonate or calcium-bicarbonate/chloride sulfate waters during the September-October 1997 sampling event (Figure 4-1). Calcium-bicarbonate and calcium-bicarbonate/chloride/sulfate waters were also the predominant compositional types found in the two uppermost screened intervals of all the deep multi-port wells except MW-20 and MW-24

(Figures 4-2 and 4-3). Calcium-bicarbonate waters were also seen in various lower screens including MW-11 (screens 3 and 4), MW-12 (screens 3 and 4), MW-14 (screen 4), MW-17 (screen 3), and MW-18 (screen 3). Intervals containing elevated concentrations of chloride and sulfate (Type 3 waters) included MW-4 (screen 2), MW-14 (screens 1-3), MW-19 (screens 3, 4, and 5), MW-21 (screens 2-5), MW-22 (screens 1 and 2), and MW-23 (screens 1 and 2).

Sodium-bicarbonate waters (Type 2) were found in the lower intervals of deep multi-port wells MW-3 (screens 3-5), MW-11 (screen 5), MW-14 (screen 5), MW-18 (screen 5), MW-20 (screens 2-5), MW-22 (screen 5), and MW-23 (screen 5). Apparent blending of Type 2 water with Type 1 (Type 4 water) was noted in MW-4 (screens 3-5), MW-12 (screen 5), MW-17 (screens 4 and 5), MW-18 (screen 4), MW-22 (screens 3 and 4), MW-23 (screens 3 and 4), and MW-24 (screens 2-5).

4.2 QUALITY ASSURANCE/QUALITY CONTROL RESULTS

To evaluate the general quality of the water chemistry data, two independent geochemical quality control checks of the analytical results from the September-October 1997 samples were performed. These checks included calculation of total ion-charge balances, and comparison of measured TDS to calculated TDS. The results of these checks for the September-October 1997 water-chemistry results are presented in Table 4-2. Charge balances are expressed as the percent difference between the sum of the equivalent weights of all of the anions and all of the cations analyzed (Freeze and Cherry, 1979). The ideal range for charge balances is $\pm$5 percent, although charge balance errors up to $\pm$10 percent are considered acceptable.

The charge balances for samples analyzed for major anions and cations during the September-October 1997 sampling event are within the ideal range ($\pm$5 percent) for 54 of the 70 sets of water chemistry results. The charge balance for the remaining sets of water chemistry analyses were slightly above 5 percent (Table 4-2), and none exceeded the range of $\pm$10%. This indicates that the results are acceptable for their intended use.

TDS results can be used to verify that all of the important water-chemistry constituents have been analyzed. This is done by comparing the measured laboratory TDS value to a calculated TDS value (calculated as the sum of the concentrations of all the major anions and cations) for each sample. Under ideal conditions, the ratio should range from 1.0 to 1.2 (Oppenheimer and Eaton, 1986).

The ratio of measured to calculated TDS values for the September-October 1997 water-chemistry results fell within the ideal range (1.0 to 1.2) for 61 of the 70 sets of water chemistry analyses performed (Table 4-2). The ratio for the remaining nine sets of water chemistry data fell slightly outside this ideal range suggesting sample inhomogeneity errors in the measured TDS values. However, these data are suitable for their intended use of identifying differences in water chemistry across the site.

5.0 WATER-LEVEL MEASUREMENTS

Water-level measurements were recorded before sampling, on September 9, 1997, and after sampling on October 29, 1997. Water-level data in the shallow wells were collected using a Solinst® water-level meter that utilized a water-sensor probe attached to a measuring tape. As the probe was lowered into a well, contact with the groundwater completed a circuit between two electrodes in the probe, thus activating a sounding device attached to a reel at the surface. Depth to groundwater was then read directly from the measuring tape at the top of the well casing.

In the deep MP wells, the potentiometric head at each sampling port in each screened interval was measured with a pressure-transducer probe manufactured by Westbay specifically for the unique casing used in these wells.

Water table elevation measurements taken before sampling are provided in Table 5-1 and have been contoured in Figure 5-1. Water table elevation measurements taken after sampling are given in Table 5-2 and are contoured in Figure 5-2.

As indicated by Figures 5-1 and 5-2, groundwater flow was primarily to the south and east both before and after sampling. The "trough" of depression observed in Figures 5-1 and 5-2 suggests active pumping by the city of Pasadena municipal production wells both immediately before and at the end of this sampling event.

The potentiometric heads measured at each deep MP well screen before and after sampling are presented graphically in Figures 5-3 and 5-4, respectively. The potentiometric pressure profile records for the deep MP wells are included in Appendix B.

The effects of pumping by the city of Pasadena production wells is represented in Figure 5-3 and 5-4 by the difference in potentiometric head between the upper- and lower-most screened intervals in the wells located nearest the production wells.

6.0 REFERENCES

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TABLES

TABLE 1-1
SUMMARY OF WELL CONSTRUCTION DETAILS FOR JPL GROUNDWATER MONITORING WELLS

Well Number	Well Type	Year Installed	Drilling Method	Depth to Bottom of Casing (feet)	Depth of Screened Interval (feet)	Elevation Top 4 inch Casing (feet above mean sea level)	Elevation of Screened Interval (feet above mean sea level)	Multi-Port Well Screen Number	Sand Pack (feet)	Screen Slot Size (inch)	Casing Material
MW-1	Shallow Standpipe	1989	Mud Rotary	120	70-110	1116.7	1006.70-1046.70	-	99		4" PVC
MW-2	Shallow Standpipe	1989	Mud Rotary	177	127-167	1168.85	1001.85-1041.85	-			
MW-3	Deep Multi-Port	1990	Mud Rotary	700	170-180	1099.82	919.82-929.82	1	37	0.010	4" low-carbon steel
					250-260		839.82-849.82	2	47	0.010	4" low-carbon steel
					344-354		745.82-755.82	3	45	0.010	4" low-carbon steel
					555-565		534.82-544.82	4	39	0.010	4" low-carbon steel
					650-660		433.82-443.82	5	64	0.010	4" low-carbon steel
MW-4	Deep Multi-Port	1990	Mud Rotary	559	147-157	1082.72	925.72-935.72	1	48	0.010	4" low-carbon steel
					237-247		835.72-845.72	2	34	0.010	4" low-carbon steel
					318-328		754.72-764.72	3	42	0.010	4" low-carbon steel
					389-399		683.72-693.72	4	54	0.010	4" low-carbon steel
					509-519		563.72-573.72	5	52	0.010	4" low-carbon steel
MW-5	Shallow Standpipe	1990	Air Percussion	140	85-135	1071.6	936.60-986.60	-	71	0.010	4" low-carbon steel
MW-6	Shallow Standpipe	1990	Air Percussion	245	195-245	1188.52	943.52-993.52	-	62	0.010	4" low-carbon steel
MW-7	Shallow Standpipe	1990	Air Percussion	275	225-275	1212.88	937.88-987.88	-	63	0.010	4" low-carbon steel
MW-8	Shallow Standpipe	1992	Air Percussion	205	155-205	1139.53	934.53-984.53	-	75	0.010	4" low-carbon steel
MW-9	Shallow Standpipe	1992	Air Percussion	68	18-68	1106.02	1038.02-1088.02	-	56	0.010	4" PVC
MW-10	Shallow Standpipe	1992	Air Percussion	155	105-155	1087.71	932.71-982.71	-	67.5	0.010	4" PVC (0-85') 4" stainless steel (85'-105')
MW-11	Deep Multi-Pornt	1992	Mud Rotary	680	140-150	1139.35	989.35-999.35	1	24	0.010	4" low-carbon steel
					250-260		879.35-889.35	2	22	0.010	4" low-carbon steel
					420-430		709.35-719.35	3	26	0.010	4" low-carbon steel
					515-525		614.35-624.35	4	26	0.010	4" low-carbon steel
					630-640		499.35-509.35	5	28	0.010	4" low-carbon steel

TABLE 1-1
SUMMARY OF WELL CONSTRUCTION DETAILS FOR JPL GROUNDWATER MONITORING WELLS

Well Number	Well Type	Year Installed	Drilling Method	Depth to Bottom of Casing (feet)	Depth of Screened Interval (feet)	Elevation Top 4 inch Casing (feet above mean sea level)	Elevation of Screened Interval (feet above mean sea level)	Multi-Port Well Screen Number	Sand Pack (feet)	Screen Slot Size (inch)	Casing Material
MW-12	Deep Multi-Port	1994	Mud Rotary	596	135-145	1102.14	957.14-967.14	1	22	0.010	4" low-carbon steel
					240-250		852.14-862.14	2	19	0.010	4" low-carbon steel
					315-325		777.14-787.14	3	21	0.010	4" low-carbon steel
					430-440		662.14-672.14	4	22	0.010	4" low-carbon steel
					546-556		546.14-556.14	5	21	0.010	4" low-carbon steel
MW-13	Shallow Standpipe	1994	Air Rotary	235	180-230	1183.47	953.47-1003.47	-	65	0.010	4" PVC
MW-14	Deep Multi-Port	1994	Mud Rotary	588	205-215	1173.42	958.42-968.42	1	22	0.010	4" low-carbon steel
					275-285		888.42-898.42	2	26	0.010	4" low-carbon steel
					380-390		783.42-793.42	3	22	0.010	4" low-carbon steel
					453-463		710.42-720.42	4	27	0.010	4" low-carbon steel
					538-548		625.42-635.42	5	21	0.010	4" low-carbon steel
MW-15	Shallow Standpipe	1994	Air Percussion	74	19-69	1120.66	1051.66-1101.66	-	60	0.010	4" stainless steel
MW-16	Shallow Standpipe	1994	Air Percussion	285	230-280	1236.27	956.27-1006.27	-	62	0.010	4.5" PVC
MW-17	Deep Multi-Port	1995	Mud Rotary	774	246-256	1190.99	934.99-944.99	1	24	0.010	4" low-carbon steel
					366-376		814.99-824.99	2	24	0.010	4" low-carbon steel
					466-476		714.99-724.99	3	27	0.010	4" low-carbon steel
					578-588		602.99-612.99	4	25	0.010	4" low-carbon steel
					723-733		457.99-467.99	5	22	0.010	4" low-carbon steel
MW-18	Deep Multi-Port	1995	Mud Rotary	732	266-276	1225.34	949.34-959.34	1	22	0.010	4" low-carbon steel
					326-336		889.34-899.34	2	24	0.010	4" low-carbon steel
					421-431		794.34-804.34	3	20	0.010	4" low-carbon steel
					561-571		654.34-664.34	4	22	0.010	4" low-carbon steel
					681-691		534.34-544.34	5	23	0.010	4" low-carbon steel
MW-19	Deep Multi-Port	1995	Mud Rotary	543	240-250	1143.2	893.20-903.20	1	20	0.010	4" low-carbon steel
					310-320		823.20-833.20	2	20	0.010	4" low-carbon steel
					390-400		743.20-753.20	3	17	0.010	4" low-carbon steel
					442-452		691.20-701.20	4	20	0.010	4" low-carbon steel
					492-502		641.20-651.20	5	22	0.010	4" low-carbon steel

TABLE 1-1
SUMMARY OF WELL CONSTRUCTION DETAILS FOR JPL GROUNDWATER MONITORING WELLS

Well Number	Well Type	Year Installed	Drilling Method	Depth to Bottom of Casing (feet)	Depth of Screened Interval (feet)	Elevation Top 4 inch Casing (feet above mean sea level)	Elevation of Screened Interval (feet above mean sea level)	Multi-Port Well Screen Number	Sand Pack (feet)	Screen Slot Size (inch)	Casing Material
MW-20	Deep Multi-Port	1995	Mud Rotary	948	228-238	1164.89	926.89-936.89	1	24	0.010	4" low-carbon steel
					388-398		766.89-776.89	2	23	0.010	4" low-carbon steel
					558-568		596.89-606.89	3	19	0.010	4" low-carbon steel
					698-708		456.89-466.89	4	23	0.010	4" low-carbon steel
					898-908		256.89-266.89	5	27	0.010	4" low-carbon steel
MW-21	Deep Multi-Port	1995	Mud Rotary	416	86-96	1058.99	962.99-972.99	1	26	0.010	4" low-carbon steel
					156-166		892.99-902.99	2	25	0.010	4" low-carbon steel
					236-246		812.99-822.99	3	21	0.010	4" low-carbon steel
					306-316		742.99-752.99	4	22	0.010	4" low-carbon steel
					366-376		682.99-692.99	5	22	0.010	4" low-carbon steel
MW-22	Deep Multi-Port	1997	Mud Rotary	634	239-249	1176.81	927.81-937.81	1	24	0.010	4" low-carbon steel
					324-334		842.81-852.81	2	21	0.010	4" low-carbon steel
					384-394		782.81-792.81	3	22	0.010	4" low-carbon steel
					464-474		702.81-712.81	4	23	0.010	4" low-carbon steel
					584-594		582.81-592.81	5	22	0.010	4" low-carbon steel
MW-23	Deep Multi-Port	1997	Mud Rotary	590	170-180	1108.34	928.34-938.34	1	23	0.010	4" low-carbon steel
					250-260		843.34-858.34	2	20.5	0.010	4" low-carbon steel
					315-325		783.34-793.34	3	18	0.010	4" low-carbon steel
					440-450		658.34-668.34	4	25	0.010	4" low-carbon steel
					540-550		558.34-568.34	5	22.5	0.010	4" low-carbon steel
MW-24	Deep Multi-Port	1997	Mud Rotary	725	275-285	1200.91	915.91-925.91	1	25	0.010	4" low-carbon steel
					370-380		820.91-830.91	2	50	0.010	4" low-carbon steel
					430-440		760.91-770.91	3	25	0.010	4" low-carbon steel
					550-560		640.91-650.91	4	19	0.010	4" low-carbon steel
					675-685		515.91-525.91	5	16	0.010	4" low-carbon steel

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, SEPTEMBER-OCTOBER 1997

Sample Location	Sample Number	Sampling Date	Sample Type	VOCs EPA 524.2	Total Cr, As, Pb, Major Cations (various)	Hexavalent Cr EPA 7196	Major Anions and TDS EPA 300.0/310.1	Perchlorate EPA 300.0 Modified	Tributyltin GC/FPD
MW-1	MW-973-01	10/28/97	GW	X	X	X	X	X	
MW-3									
Screen 1	MW-973-02	9/15/97	GW	X	X	X	X	X	
Screen 2	MW-973-03	9/15/97	GW	X	X	X	X	X	
Screen 3	MW-973-04	9/12/97	GW	X	X	X	X	X	
Screen 4	MW-973-05	9/12/97	GW	X	X	X	X	X	
Screen 5	MW-973-06	9/12/97	GW	X	X	X	X	X	
MW-4									
Screen 1	MW-973-07	9/24/97	GW	X	X	X	X	X	
Screen 2	MW-973-08	9/24/97	GW	X	X	X	X	X	
Screen 2	MW-973-09	9/24/97	DUP	X	X (no cations)	X		X	
Screen 3	MW-973-10	9/24/97	GW	X	X	X	X	X	
Screen 4	MW-973-11	9/24/97	GW	X	X	X	X	X	
Screen 5	MW-973-12	9/24/97	GW	X	X	X	X	X	
MW-5	MW-973-13	10/27/97	GW	X	X	X	X	X	
MW-6	MW-973-14	10/22/97	GW	X	X	X	X	X	
MW-7	MW-973-15	10/29/97	GW	X	X	X	X	X	
MW-8	MW-973-16	10/22/97	GW	X	X	X	X	X	X
MW-9	MW-973-17	10/28/97	GW	X	X	X	X	X	
MW-10	MW-973-18	10/27/97	GW	X	X	X	X	X	
MW-10	MW-973-19	10/27/97	DUP	X	X (no cations)	X		X	
MW-11									
Screen 1	MW-973-20	10/2/97	GW	X	X	X	X	X	
Screen 2	MW-973-21	10/1/97	GW	X	X	X	X	X	
Screen 3	MW-973-22	10/1/97	GW	X	X	X	X	X	
Screen 4	MW-973-23	10/1/97	GW	X	X	X	X	X	
Screen 5	MW-973-24	10/1/97	GW	X	X	X	X	X	

GW: Groundwater Sample
DUP: Duplicate Sample
1 Not Sampled: no water over screen

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, SEPTEMBER-OCTOBER 1997

Sample Location	Sample Number	Sampling Date	Sample Type	VOCs EPA 524.2	Total Cr, As, Pb, Major Cations (various)	Hexavalent Cr EPA 7196	Major Anions and TDS EPA 300.0/310.1	Perchlorate EPA 300.0 Modified	Tributyltin GC/FPD
MW-12									
Screen 1	Not Sampled[1]								
Screen 2	MW-973-27	10/2/97	GW	X	X	X	X	X	
Screen 3	MW-973-28	10/2/97	GW	X	X	X	X	X	
Screen 4	MW-973-29	10/2/97	GW	X	X	X	X	X	
Screen 5	MW-973-30	10/2/97	GW	X	X	X	X	X	
MW-13	MW-973-31	9/25/97	GW	X	X	X	X	X	
MW-13	MW-973-32	9/25/97	DUP	X	X (no cations)	X		X	
MW-14									
Screen 1	MW-973-33	9/25/97	GW	X	X	X	X	X	
Screen 2	MW-973-34	9/25/97	GW	X	X	X	X	X	
Screen 3	MW-973-35	9/25/97	GW	X	X	X	X	X	
Screen 4	MW-973-36	9/29/97	GW	X	X	X	X	X	
Screen 5	MW-973-37	9/25/97	GW	X	X	X	X	X	
MW-15	MW-973-38	10/27/97	GW	X	X	X	X	X	
MW-16	Not Sampled[1]								
MW-17									
Screen 1	MW-973-40	9/16/97	GW	X	X	X	X	X	
Screen 2	MW-973-41	9/16/97	GW	X	X	X	X	X	
Screen 3	MW-973-42	9/16/97	GW	X	X	X	X	X	
Screen 4	MW-973-43	9/15/97	GW	X	X	X	X	X	
Screen 5	MW-973-44	9/18/97	GW	X	X	X	X	X	
MW-18									
Screen 1	Not Sampled[1]								
Screen 2	MW-973-46	9/23/97	GW	X	X	X	X	X	
Screen 3	MW-973-47	9/23/97	GW	X	X	X	X	X	
Screen 4	MW-973-48	9/23/97	GW	X	X	X	X	X	
Screen 5	MW-973-49	9/23/97	GW	X	X	X	X	X	

GW: Groundwater Sample
DUP: Duplicate Sample
1 Not Sampled: no water over screen

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, SEPTEMBER-OCTOBER 1997

Sample Location	Sample Number	Sampling Date	Sample Type	VOCs EPA 524.2	Total Cr, As, Pb, Major Cations (various)	Hexavalent Cr EPA 7196	Major Anions and TDS EPA 300.0/310.1	Perchlorate EPA 300.0 Modified	Tributyltin GC/FPD
MW-19									
Screen 1	MW-973-50	9/19/97	GW	X	X	X	X	X	
Screen 2	MW-973-51	9/22/97	GW	X	X	X	X	X	
Screen 3	MW-973-52	9/19/97	GW	X	X	X	X	X	
Screen 4	MW-973-53	9/18/97	GW	X	X	X	X	X	
Screen 5	MW-973-54	9/18/97	GW	X	X	X	X	X	
MW-20									
Screen 1	Not Sampled[1]								
Screen 2	MW-973-56	9/22/97	GW	X	X	X	X	X	
Screen 3	MW-973-57	9/22/97	GW	X	X	X	X	X	
Screen 4	MW-973-58	9/22/97	GW	X	X	X	X	X	
Screen 5	MW-973-59	9/22/97	GW	X	X	X	X	X	
MW-21									
Screen 1	Not Sampled[1]								
Screen 2	MW-973-61	9/29/97	GW	X	X	X	X	X	
Screen 3	MW-973-62	10/1/97	GW	X	X	X	X	X	
Screen 4	MW-973-63	9/29/97	GW	X	X	X	X	X	
Screen 5	MW-973-64	9/30/97	GW	X	X	X	X	X	
MW-22									
Screen 1	MW-973-65	10/15/97	GW	X	X	X	X	X	
Screen 2	MW-973-66	10/14/97	GW	X	X	X	X	X	
Screen 3	MW-973-67	10/13/97	GW	X	X	X	X	X	
Screen 4	MW-973-68	10/9/97	GW	X	X	X	X	X	
Screen 5	MW-973-69	10/9/97	GW	X	X	X	X	X	

GW: Groundwater Sample
DUP: Duplicate Sample
1 Not Sampled: no water over screen

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, SEPTEMBER-OCTOBER 1997

Sample Location	Sample Number	Sampling Date	Sample Type	VOCs EPA 524.2	Total Cr, As, Pb, Major Cations (various)	Hexavalent Cr EPA 7196	Major Anions and TDS EPA 300.0/310.1	Perchlorate EPA 300.0 Modified	Tributyltin GC/FPD
MW-23									
Screen 1	MW-973-70	10/22/97	GW	X	X	X	X	X	
Screen 2	MW-973-71	10/16/97	GW	X	X	X	X	X	
Screen 3	MW-973-72	10/21/97	GW	X	X	X	X	X	
Screen 4	MW-973-73	10/21/97	GW	X	X	X	X	X	
Screen 5	MW-973-74	10/21/97	GW	X	X	X	X	X	
MW-24									
Screen 1	MW-973-75	10/7/97	GW	X	X	X	X	X	
Screen 2	MW-973-76	10/8/97	GW	X	X	X	X	X	
Screen 3	MW-973-77	10/8/97	GW	X	X	X	X	X	
Screen 4	MW-973-78	10/6/97	GW	X	X	X	X	X	
Screen 5	MW-973-79	10/6/97	GW	X	X	X	X	X	

GW: Groundwater Sample
DUP: Duplicate Sample
1 Not Sampled: no water over screen

TABLE 3-2

LOCATION OF WELL SCREENS IN AQUIFER LAYERS

Well Number	AQUIFER LAYERS			
	Layer 1	Layer 2	Layer 3	Layer 4
MW-1	X			
MW-3				
Screen 1	X			
Screen 2		X		
Screen 3		X		
Screen 4			X	
Screen 5			X	
MW-4				
Screen 1	X			
Screen 2		X		
Screen 3		X		
Screen 4			X	
Screen 5			X	
MW-5	X			
MW-6	X			
MW-7	X			
MW-8	X			
MW-9	X			
MW-10	X			
MW-11				
Screen 1	X			
Screen 2	X			
Screen 3		X		
Screen 4			X	
Screen 5			X	
MW-12				
Screen 1	X			
Screen 2		X		
Screen 3		X		
Screen 4			X	
Screen 5			X	
MW-13	X			
MW-14				
Screen 1	X			
Screen 2		X		
Screen 3		X		
Screen 4			X	
Screen 5			X	

TABLE 3-2

LOCATION OF WELL SCREENS IN AQUIFER LAYERS

Well Number	AQUIFER LAYERS			
	Layer 1	Layer 2	Layer 3	Layer 4
MW-15	X			
MW-16	X			
MW-17				
Screen 1	X			
Screen 2		X		
Screen 3		X		
Screen 4			X	
Screen 5			X	
MW-18				
Screen 1	X			
Screen 2	X			
Screen 3		X		
Screen 4			X	
Screen 5			X	
MW-19				
Screen 1	X			
Screen 2		X		
Screen 3		X		
Screen 4			X	
Screen 5			X	
MW-20				
Screen 1	X			
Screen 2		X		
Screen 3			X	
Screen 4			X	
Screen 5				X
MW-21				
Screen 1	X			
Screen 2		X		
Screen 3		X		
Screen 4			X	
Screen 5			X	
MW-22				
Screen 1	X			
Screen 2		X		
Screen 3		X		
Screen 4			X	
Screen 5			X	

TABLE 3-2

LOCATION OF WELL SCREENS IN AQUIFER LAYERS

Well Number	AQUIFER LAYERS			
	Layer 1	Layer 2	Layer 3	Layer 4
MW-23				
Screen 1	X			
Screen 2		X		
Screen 3		X		
Screen 4			X	
Screen 5			X	
MW-24				
Screen 1	X			
Screen 2		X		
Screen 3		X		
Screen 4			X	
Screen 5			X	

TABLE 3-3

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, SEPTEMBER-OCTOBER 1997

(concentrations in µg/l)
Values above state or federal MCLs or action levels are in bold and shaded

Sampling Location	Sample Number	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Chloroform	Other Volatile Organic Compounds	Perchlorate
MW-1	MW-973-1	--	--	--	--	--	--	--	--	1.3 m,p-Xylenes 1.2 Toluene	--
MW-3											
Screen 1	MW-973-2	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-973-3	--	--	--	--	--	--	--	0.8	--	--
Screen 3	MW-973-4	**1.2**	0.5	--	--	--	--	--	1.6	--	13
Screen 4	MW-973-5	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-973-6	--	--	--	--	--	--	--	--	--	--
MW-4											
Screen 1	MW-973-7	--	--	--	--	--	--	--	--	--	7.4
Screen 2	MW-973-8	**4.0**	**8.0**	0.5	0.6	--	0.5	--	3.5	--	**34**
Screen 2 (DUP)	MW-973-9	**2.8**	**5.3**	--	--	--	--	--	2.5	--	**34**
Screen 3	MW-973-10	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-973-11	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-973-12	--	--	--	--	--	--	--	--	--	--
MW-5	MW-973-13	--	--	--	--	--	--	--	--	--	--
MW-6	MW-973-14	--	--	--	--	--	--	--	--	--	--
MW-7	MW-973-15	**93**	**22**	1.1	--	**0.9**	1.3	4.7	13	--	**550**
MW-8	MW-973-16	**3.2**	3.6	--	--	--	--	--	1.2	1.0 Freon 11	**29**
MW-9	MW-973-17	--	--	--	--	--	--	--	--	--	--
MW-10	MW-973-18	--	4.3	1.3	1.2	--	--	--	1.0	--	16
MW-10 (DUP)	MW-973-19	--	4.4	1.4	1.2	--	--	--	1.2	--	16

E: Estimated concentration; result exceeded calibration range
--: Not detected
a: Only VOCs for which MCLs have been established are listed

1: Not sampled, no water over screen
2: California Department of Health Services Interim Action Level

DUP: Duplicate
NE: Not established

TABLE 3-3

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, SEPTEMBER-OCTOBER 1997

(concentrations in µg/l)
Values above state or federal MCLs or action levels are in bold and shaded

Sampling Location	Sample Number	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Chloroform	Other Volatile Organic Compounds	Perchlorate
MW-11											
Screen 1	MW-973-20	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-973-21	**0.6**	--	--	--	--	--	--	0.6	--	--
Screen 3	MW-973-22	**0.6**	--	--	--	--	--	--	1.3	--	--
Screen 4	MW-973-23	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-973-24	--	--	--	--	--	--	--	--	--	--
MW-12											
Screen 1	Not Sampled[1]										
Screen 1 (DUP)	Not Sampled[1]										
Screen 2	MW-973-27	**0.8**	--	--	--	--	--	--	0.8	--	5.8
Screen 3	MW-973-28	**14**	--	--	--	--	--	--	1.7	--	6.2
Screen 4	MW-973-29	**3.8**	--	--	--	--	--	--	1.0	--	7.6
Screen 5	MW-973-30	**1.3**	--	--	--	--	--	--	--	--	--
MW-13	MW-973-31	**8.2**	**19**	--	--	**1.1**	0.5	--	10	--	**210**
MW-13 (DUP)	MW-973-32	**8.0**	**16**	--	--	**1.1**	0.5	--	11	--	**280**
MW-14											
Screen 1	MW-973-33	--	--	--	1.9	--	--	--	--	--	--
Screen 2	MW-973-34	--	1.2	1.9	1.6	--	--	--	0.8	--	--
Screen 3	MW-973-35	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-973-36	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-973-37	--	--	--	--	--	--	--	--	--	--
MW-15	MW-973-38	--	--	--	--	--	--	--	--	--	--
MW-16	Not Sampled[1]										

E: Estimated concentration; result exceeded calibration range
--: Not detected
a: Only VOCs for which MCLs have been established are listed

1: Not sampled, no water over screen
2: California Department of Health Services Interim Action Level

DUP: Duplicate
NE: Not established

TABLE 3-3

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, SEPTEMBER-OCTOBER 1997

(concentrations in µg/l)
Values above state or federal MCLs or action levels are in bold and shaded

Sampling Location	Sample Number	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Chloroform	Other Volatile Organic Compounds	Perchlorate
MW-17											
Screen 1	MW-973-40	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-973-41	--	--	--	--	--	--	--	6.1	--	--
Screen 3	MW-973-42	**6.6**	**22**	1.4	--	--	--	--	8.5	0.7 Bromodichloromethane	**55**
Screen 4	MW-973-43	--	**6.8**	0.5	--	--	--	--	1.0	--	16
Screen 5	MW-973-44	--	**8.6**	0.6	--	--	--	--	1.4	--	15
MW-18											
Screen 1	Not Sampled[1]										
Screen 2	MW-973-46	--	--	--	--	--	--	--	2.0	0.5 Bromodichloromethane	--
Screen 3	MW-973-47	--	3.0	1.9	--	--	--	--	6.2	--	--
Screen 4	MW-973-48	**2.4**	--	0.7	--	--	--	--	--	1.5 Carbon disulfide	12
Screen 5	MW-973-49	--	--	--	--	--	--	--	--	--	--
MW-19											
Screen 1	MW-973-50	--	--	--	--	--	--	--	1.4	--	--
Screen 2	MW-973-51	--	--	--	--	--	--	--	--	--	--
Screen 3	MW-973-52	--	--	1.5	--	--	--	--	--	0.6 Toluene	--
Screen 4	MW-973-53	--	0.7	0.6	--	--	--	--	1.7	--	4.9
Screen 5	MW-973-54	--	--	2.2	--	--	--	--	0.8	--	--
MW-20											
Screen 1	Not Sampled[1]										
Screen 2	MW-973-56	--	--	--	--	--	--	--	5.2	0.5 Bromodichloromethane	--
Screen 3	MW-973-57	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-973-58	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-973-59	--	--	--	--	--	--	--	--	--	--

E: Estimated concentration; result exceeded calibration range
--: Not detected
a: Only VOCs for which MCLs have been established are listed
1: Not sampled, no water over screen
2: California Department of Health Services Interim Action Level
DUP: Duplicate
NE: Not established

TABLE 3-3

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, SEPTEMBER-OCTOBER 1997

(concentrations in µg/l)
Values above state or federal MCLs or action levels are in bold and shaded

Sampling Location	Sample Number	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Chloroform	Other Volatile Organic Compounds	Perchlorate
MW-21											
Screen 1	Not Sampled[1]										
Screen 2	MW-973-61	--	--	--	--	--	--	--	--	--	--
Screen 3	MW-973-62	--	0.6	1.3	--	--	--	--	--	--	--
Screen 4	MW-973-63	--	0.6	4.4	--	--	--	--	--	--	7.7
Screen 5	MW-973-64	--	--	2.9	--	--	--	--	--	--	--
MW-22											
Screen 1	MW-973-65	--	--	2.0	0.7	--	--	--	--	--	--
Screen 2	MW-973-66	--	--	--	--	--	--	--	--	0.8 Dichloromethane	--
Screen 3	MW-973-67	--	--	--	--	--	--	--	--	--	15
Screen 4	MW-973-68	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-973-69	--	--	--	--	--	--	--	--	--	--
MW-23											
Screen 1	MW-973-70	--	3.1	0.6	0.8	--	--	--	--	--	4.4
Screen 2	MW-973-71	--	--	--	--	--	--	--	--	--	7.6
Screen 3	MW-973-72	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-973-73	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-973-74	--	--	--	--	--	--	--	--	--	--
MW-24											
Screen 1	MW-973-75	**5.0**	**5.0**	--	--	--	--	0.6	3.1	--	**92**
Screen 2	MW-973-76	**13**	1.3	--	--	--	--	--	3.8	--	**200**
Screen 3	MW-973-77	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-973-78	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-973-79	--	--	--	--	--	--	--	--	--	--

E: Estimated concentration; result exceeded calibration range
--: Not detected
a: Only VOCs for which MCLs have been established are listed

1: Not sampled, no water over screen
2: California Department of Health Services Interim Action Level

DUP: Duplicate
NE: Not established

TABLE 3-3

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, SEPTEMBER-OCTOBER 1997

(concentrations in µg/l)
Values above state or federal MCLs or action levels are in bold and shaded

Sampling Location	Sample Number	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Chloroform	Other Volatile Organic Compounds	Perchlorate
Practical Quantitation Limit		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	4.0
California Maximum Contaminated Level		0.5	5.0	5.0	5.0	0.5	6.0	1,200	100	150 Toluene [a] 1,750 Xylenes (total)	18 [2]
EPA Region IX Maximum Contaminant Level		5.0	5.0	5.0	NE	5.0	7.0	NE	100	100 Bromodichloromethane [a] 1,000 Toluene 10,000 Xylenes (total)	NE

E: Estimated concentration; result exceeded calibration range
--: Not detected
a: Only VOCs for which MCLs have been established are listed

1: Not sampled, no water over screen
2: California Department of Health Services Interim Action Level

DUP: Duplicate
NE: Not established

TABLE 3-4

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in µg/l)

Values above state and/or federal MCLs or action levels are in bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
MW-1	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.9 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	1.9 Acetone	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	1.3 m,p-xylenes 1.2 Toluene	--
MW-3											
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	1.2	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	8.3	0.7(B) Naphthalene	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	2.6 Carbon disulfide	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
Screen 2	Aug/Sep 1996	--	--	--	--	--	--	--	5.5	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	4.8	1.9(B) Naphthalene	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	4.4	8.0 Carbon disulfide	NA
	Jun/Jul 1997	--	--	--	--	--	--	1.0	1.2	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	0.8	--	--
Screen 3	Aug/Sep 1996	**0.6**	0.8	--	--	--	--	--	1.6	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	0.7	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	0.8	--	NA
	Jun/Jul 1997	**1.2**	0.8	0.6	--	--	--	2.8	1.8	--	**21**
	Sep/Oct 1997	**1.2**	0.5	--	--	--	--	--	1.6	--	13
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.2 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	1.0 Hexane	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--

--: Not detected
*: Not sampled, no water over screen
TB: Compound detected in associated trip blank
B: Compound detected in the laboratory method blank

NA: Not analyzed
NE: Not established
1: Wells installed June-August 1997
2: California Department of Health Services Interim Action Level

a: Only VOCs for which MCLs have been established are listed
E: Estimated concentration; result exceeded calibration range

TABLE 3-4

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in µg/l)

Values above state and/or federal MCLs or action levels are in bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.1 Dichloromethane	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	2.1 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	1.2 Carbon disulfide 1.5 Carbon disulfide 2.7 Sulfur dioxide 1.3 Unknown (RT=2.51)	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	4.5 Carbon disulfide	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
MW-4											
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.9(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	7.4
Screen 2	Aug/Sep 1996	**5.5**	**19**	--	--	**0.9**	0.7	--	6.7	3.2(B) Acetone	NA
	Oct/Nov 1996	**5.3**	**15**	--	--	**0.6**	0.8	--	5.4	1.8 Acetone	NA
	Feb/Mar 1997	**7.9**	**19**	--	--	**0.8**	0.8	--	7.8	--	NA
	Jun/Jul 1997	**4.0**	**5.7**	--	--	--	0.5	--	3.4	--	**51**
	Sep/Oct 1997	**4.0**	**8.0**	0.5	0.6	--	0.5	--	3.5	--	**34**
Screen 3	Aug/Sep 1996	--	--	--	--	--	--	--	--	3.0(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.5 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	--	3.9(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.6 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--

--: Not detected
*: Not sampled, no water over screen
TB: Compound detected in associated trip blank
B: Compound detected in the laboratory method blank
NA: Not analyzed
NE: Not established
1: Wells installed June-August 1997
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(concentrations in µg/l)

Values above state and/or federal MCLs or action levels are in bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 5	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.9 Acetone	NA
	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
MW-5	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
MW-6	Aug/Sep 1996	--	--	--	--	--	--	--	1.3(TB)	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	0.8	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	5.5
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
MW-7	Aug/Sep 1996	**90**	**39**	0.8	--	**1.2**	1.1	7.2	13(TB)	--	NA
	Oct/Nov 1996	**170**	**27**	1.3	--	**0.8**	2.3	7.7	14	4.3(B) 1,1-Difluoroethane 2.8(B) Acetone	NA
	Feb/Mar 1997	**45**	**27**	0.6	--	**0.8**	0.9	5.1	9.9	--	NA
	Jun/Jul 1997	**39**	**23**	0.7	--	**0.8**	1.0	4.1	11	10 Unknown	**285**
	Sep/Oct 1997	**93**	**22**	1.1	--	**0.9**	1.3	4.7	13	--	**550**
MW-8	Aug/Sep 1996	**4.0**	4.6	--	--	--	--	--	1.3	--	NA
	Oct/Nov 1996	**2.8**	2.2	--	--	--	--	0.6	0.6	1.7 Acetone	NA
	Feb/Mar 1997	**1.5**	4.5	--	--	--	--	--	1.3	1.1 Freon 11 1.9 Carbon disulfide	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	6.4
	Sep/Oct 1997	3.2	3.6	--	--	--	--	--	1.2	1.0 Freon 11	**29**

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(concentrations in µg/l)

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Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
MW-9	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
MW-10	Aug/Sep 1996	**0.7**	**18**	0.5	--	--	--	1.2	1.4(TB)	--	NA
	Oct/Nov 1996	**0.6**	**6.6**	1.0	1.9	--	--	0.8	1.1	3.0(B) Acetone 1.1 Unknown scan #350	NA
	Feb/Mar 1997	--	**5.2**	--	--	--	--	--	0.6	--	NA
	Jun/Jul 1997	--	2.2	--	--	--	--	--	--	--	11
	Sep/Oct 1997	--	4.3	1.3	1.2	--	--	--	1.0	--	16
MW-11											
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.6(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	7.1 MTBE 1.8 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	**1.4**	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
Screen 2	Aug/Sep 1996	**2.4**	--	--	--	--	--	--	1.0	--	NA
	Oct/Nov 1996	**1.1**	--	--	--	--	--	--	1.2	--	NA
	Feb/Mar 1997	**1.7**	--	--	--	--	--	--	1.0	--	NA
	Jun/Jul 1997	**1.2**	--	--	--	--	--	--	1.0	--	--
	Sep/Oct 1997	**0.6**	--	--	--	--	--	--	0.6	--	--
Screen 3	Aug/Sep 1996	**0.9**	--	--	--	--	--	--	1.3	2.9(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	1.4	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	1.1	--	NA
	Jun/Jul 1997	**0.7**	--	--	--	--	--	--	1.4	--	--
	Sep/Oct 1997	**0.6**	--	--	--	--	--	--	1.3	--	--

--: Not detected
*: Not sampled, no water over screen
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TABLE 3-4

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(concentrations in µg/l)

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Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	0.5	2.4(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	1.5 2-Methyl-1-Propene	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.4(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.1 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
MW-12											
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	4.1	--	NA
	Oct/Nov 1996	Not Sampled*									
	Feb/Mar 1997	--	--	--	--	--	--	--	5.8	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	0.5	--	--
	Sep/Oct 1997	Not Sampled*									
Screen 2	Aug/Sep 1996	**0.9**	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	**1.5**	0.6	--	--	--	--	0.5	--	--	NA
	Feb/Mar 1997	**1.1**	0.5	--	--	--	--	--	--	1.1(B) Acetone	NA
	Jun/Jul 1997	**1.0**	--	--	--	--	--	--	0.8	--	6.9
	Sep/Oct 1997	**0.8**	--	--	--	--	--	--	0.8	--	5.8
Screen 3	Aug/Sep 1996	**4.5**	--	--	--	--	--	--	1.3	--	NA
	Oct/Nov 1996	**3.8**	--	--	--	--	--	--	1.3	1.6 Acetone	NA
	Feb/Mar 1997	**6.4**	--	--	--	--	--	--	1.4	1.3(B) Acetone	NA
	Jun/Jul 1997	**20**	--	--	--	--	--	--	1.6	--	5.7
	Sep/Oct 1997	**14**	--	--	--	--	--	--	1.7	--	6.2
Screen 4	Aug/Sep 1996	**6.3**	--	--	--	--	--	--	1.4	--	NA
	Oct/Nov 1996	**5.1**	--	--	--	--	--	--	1.4	2.5 Acetone	NA
	Feb/Mar 1997	**4.9**	--	--	--	--	--	--	1.3	--	NA
	Jun/Jul 1997	**4.9**	--	--	--	--	--	--	1.3	--	7.3
	Sep/Oct 1997	**3.8**	--	--	--	--	--	--	1.0	--	7.6

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(concentrations in µg/l)

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Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 5	Aug/Sep 1996	**3.4**	--	--	--	--	--	--	0.7	--	NA
	Oct/Nov 1996	**1.3**	--	--	--	--	--	--	--	1.5 Acetone	NA
	Feb/Mar 1997	**1.7**	--	--	--	--	--	--	0.5	--	NA
	Jun/Jul 1997	**1.9**	--	--	--	--	--	--	0.5	--	4.1
	Sep/Oct 1997	**1.3**	--	--	--	--	--	--	--	--	--
MW-13	Aug/Sep 1996	**21**	**47**	0.6	--	**2.5**	1.5	0.7	21(TB)	--	NA
	Oct/Nov 1996	**27**	**27**	--	--	**1.9**	1.5	0.6	14	--	NA
	Feb/Mar 1997	**18**	**28**	--	--	**0.9**	1.1	0.6	9.2	--	NA
	Jun/Jul 1997	**6.4**	**24 E**	--	--	**0.9**	0.5	--	11	--	**130**
	Sep/Oct 1997	**8.2**	**19**	--	--	**1.1**	0.5	--	10	--	**210**
MW-14											
Screen 1	Aug/Sep 1996	--	--	--	2.4	--	--	--	0.6	--	NA
	Oct/Nov 1996	--	--	--	2.9	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	0.7	1.5	--	--	--	0.7	--	NA
	Jun/Jul 1997	--	--	--	2.0	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	1.9	--	--	--	--	--	--
Screen 2	Aug/Sep 1996	--	2.8	1.6	1.4	--	--	--	1.5	--	NA
	Oct/Nov 1996	--	1.5	1.6	1.0	--	--	--	0.9	0.6 1,2,3-Trichlorobenzene 1.1 Acetone	NA
	Feb/Mar 1997	--	0.9	1.9	1.3	--	--	--	0.8	0.8 1,2,3-Trichlorobenzene 1.1 Acetone	NA
	Jun/Jul 1997	--	1.1	1.7	1.5	--	--	--	0.9	0.5 1,2,3-Trichlorobenzene	--
	Sep/Oct 1997	--	1.2	1.9	1.6	--	--	--	0.8	--	--
Screen 3	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	4.3
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--

--: Not detected
*: Not sampled, no water over screen
TB: Compound detected in associated trip blank
B: Compound detected in the laboratory method blank
NA: Not analyzed
NE: Not established
1: Wells installed June-August 1997
2: California Department of Health Services Interim Action Level
a: Only VOCs for which MCLs have been established are listed
E: Estimated concentration; result exceeded calibration range

TABLE 3-4

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in µg/l)

Values above state and/or federal MCLs or action levels are in bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.1(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.6(TB) Acetone	NA
										1.3 Carbon disulfide	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
MW-15	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	2.6 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
MW-16	Aug/Sep 1996	**125**	**33**	1.3	--	**2.4**	2.2	2.0	40(TB)	--	NA
	Not Sampled*	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	**91**	**23**	1.3	--	**1.7**	2.6	1.6	29	--	NA
	Jun/Jul 1997	**68**	**25**	1.1	--	**2.1**	1.7	0.6	43	--	**615**
	Sep/Oct 1997	Not Sampled*									
MW-17											
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	--	4.3(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.4 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--

--: Not detected
*: Not sampled, no water over screen
TB: Compound detected in associated trip blank
B: Compound detected in the laboratory method blank
NA: Not analyzed
NE: Not established
1: Wells installed June-August 1997
2: California Department of Health Services Interim Action Level
a: Only VOCs for which MCLs have been established are listed
E: Estimated concentration; result exceeded calibration range

TABLE 3-4

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(concentrations in µg/l)

Values above state and/or federal MCLs or action levels are in bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 2	Aug/Sep 1996	--	--	--	--	--	--	--	3.8	4.5(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	6.0	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	5.2	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	4.1	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	6.1	--	--
Screen 3	Aug/Sep 1996	**2.0**	**7.9**	--	--	--	--	--	7.5	--	NA
	Oct/Nov 1996	**3.3**	**18**	0.8	--	--	--	--	8.7	--	NA
	Feb/Mar 1997	**5.1**	**23**	1.1	--	--	--	--	6.2	--	NA
	Jun/Jul 1997	**1.3**	**5.9**	--	--	--	--	--	8.2	--	12
	Sep/Oct 1997	**6.6**	**22**	1.4	--	--	--	--	9.2	--	**55**
Screen 4	Aug/Sep 1996	--	**9.5**	0.5	--	--	--	--	1.1	--	NA
	Oct/Nov 1996	--	**8.9**	--	--	--	--	--	1.5	--	NA
	Feb/Mar 1997	--	**5.8**	--	--	--	--	--	0.7	--	NA
	Jun/Jul 1997	--	4.5	--	--	--	--	--	0.6	--	13
	Sep/Oct 1997	--	**6.8**	0.5	--	--	--	--	1.0	--	16
Screen 5	Aug/Sep 1996	--	**13**	0.6	--	--	--	--	1.7	3.4(B) Acetone	NA
	Oct/Nov 1996	--	**16**	0.7	--	--	--	--	1.7	--	NA
	Feb/Mar 1997	--	**14**	0.7	--	--	--	--	1.3	--	NA
	Jun/Jul 1997	--	**11**	0.7	--	--	--	--	1.3	--	12
	Sep/Oct 1997	--	**8.6**	0.6	--	--	--	--	1.4	--	15
MW-18											
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	1.6	--	NA
	Oct/Nov 1996	Not Sampled*									
	Feb/Mar 1997	--	--	--	--	--	--	--	3.0	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	0.8	--	--
	Sep/Oct 1997	Not Sampled*									
Screen 2	Aug/Sep 1996	--	--	--	--	--	--	--	7.3	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	8.2	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	1.9	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	4.5	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	2.5	--	--

--: Not detected
*: Not sampled, no water over screen
TB: Compound detected in associated trip blank
B: Compound detected in the laboratory method blank
NA: Not analyzed
NE: Not established
1: Wells installed June-August 1997
2: California Department of Health Services Interim Action Level
a: Only VOCs for which MCLs have been established are listed
E: Estimated concentration; result exceeded calibration range

TABLE 3-4

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in µg/l)

Values above state and/or federal MCLs or action levels are in bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 3	Aug/Sep 1996	**0.7**	4.7	2.8	--	--	--	--	5.1	--	NA
	Oct/Nov 1996	**0.7**	**6.4**	3.2	--	--	--	--	5.6	--	NA
	Feb/Mar 1997	**0.8**	**6.6**	2.9	--	--	--	--	5.1	--	NA
	Jun/Jul 1997	**0.6**	2.4	1.8	--	--	--	--	4.4	--	--
	Sep/Oct 1997	--	3.0	1.9	--	--	--	--	6.2	--	--
Screen 4	Aug/Sep 1996	**2.2**	--	0.7	--	--	--	--	0.5	--	NA
	Oct/Nov 1996	**2.2**	--	0.7	--	--	--	--	0.5	1.4(TB) Acetone	NA
	Feb/Mar 1997	**2.2**	--	1.5	--	--	--	--	0.6	--	NA
	Jun/Jul 1997	**1.9**	--	0.7	--	--	--	--	--	--	11
	Sep/Oct 1997	**2.4**	--	0.7	--	--	--	--	--	1.5 Carbon Disulfide	12
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.6 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	1.1 Carbon disulfide	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
MW-19											
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	0.9	3.7(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	0.6	2.9 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	0.8	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	2.5	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	1.4	--	--
Screen 2	Aug/Sep 1996	--	--	0.8	--	--	--	--	--	3.0(B) Acetone	NA
	Oct/Nov 1996	--	--	1.1	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	0.6	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
Screen 3	Aug/Sep 1996	--	--	3.1	--	--	--	--	--	2.6(B) Acetone	NA
	Oct/Nov 1996	--	--	2.5	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	2.1	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	2.0	--	--	--	--	--	--	4.1
	Sep/Oct 1997	--	--	1.5	--	--	--	--	--	0.6 Toluene	--

--: Not detected
*: Not sampled, no water over screen
TB: Compound detected in associated trip blank
B: Compound detected in the laboratory method blank
NA: Not analyzed
NE: Not established
1: Wells installed June-August 1997
2: California Department of Health Services Interim Action Level
a: Only VOCs for which MCLs have been established are listed
E: Estimated concentration; result exceeded calibration range

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SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in µg/l)

Values above state and/or federal MCLs or action levels are in bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 4	Aug/Sep 1996	**0.5**	1.5	--	--	--	--	--	2.1	--	NA
	Oct/Nov 1996	--	1.5	--	--	--	--	--	1.9	--	NA
	Feb/Mar 1997	--	1.1	0.6	--	--	--	--	1.5	--	NA
	Jun/Jul 1997	--	0.7	--	--	--	--	--	1.3	--	--
	Sep/Oct 1997	--	0.7	0.6	--	--	--	--	1.7	--	4.9
Screen 5	Aug/Sep 1996	--	--	3.0	--	--	--	--	0.6	1.6(B) Unknown scan #940	NA
	Oct/Nov 1996	--	--	2.4	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	1.7	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	1.5	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	2.2	--	--	--	--	0.8	--	--
MW-20											
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	0.7	3.4(B) Acetone	NA
	Not Sampled*	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	1.4	2.4(EB) Acetone	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	0.8	--	5.7
	Sep/Oct 1997	Not Sampled*									
Screen 2	Aug/Sep 1996	--	--	--	--	--	--	--	7.7	4.0(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	4.4	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	3.2	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	3.3	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	5.7	--	--
Screen 3	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.7(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	0.6	2.3 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	--	3.8(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--

--: Not detected
*: Not sampled, no water over screen
TB: Compound detected in associated trip blank
B: Compound detected in the laboratory method blank
NA: Not analyzed
NE: Not established
1: Wells installed June-August 1997
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(concentrations in µg/l)

Values above state and/or federal MCLs or action levels are in bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	4.8(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
MW-21											
Screen 1	Aug/Sep 1996	--	**33**	0.7	--	--	--	--	1.8	2.3(B) Acetone	NA
	Not Sampled*										
	Feb/Mar 1997	--	**29**	--	--	--	--	--	2.2	--	NA
	Jun/Jul 1997	--	**20**	--	--	--	--	--	1.6	--	**19**
	Sep/Oct 1997	Not Sampled*									
Screen 2	Aug/Sep 1996	--	--	0.9	--	--	--	--	0.5	--	NA
	Oct/Nov 1996	--	0.6	2.3	--	--	--	--	0.6	1.4(TB) Acetone	NA
	Feb/Mar 1997	--	--	1.1	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	0.7	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
Screen 3	Aug/Sep 1996	--	0.7	1.5	--	--	--	--	0.5	--	NA
	Oct/Nov 1996	--	0.9	1.6	--	--	--	--	--	1.2 Acetone	NA
	Feb/Mar 1997	--	0.8	1.6	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	1.2	--	--	--	--	--	--	--
	Sep/Oct 1997	--	0.6	1.3	--	--	--	--	--	--	--
Screen 4	Aug/Sep 1996	--	0.8	4.2	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	2.5	--	--	--	--	--	1.6 Acetone	NA
	Feb/Mar 1997	--	--	1.8	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	2.8	--	--	--	--	--	--	4.6
	Sep/Oct 1997	--	0.6	4.4	--	--	--	--	--	--	7.7
Screen 5	Aug/Sep 1996	--	--	4.5	--	--	--	--	0.6	--	NA
	Oct/Nov 1996	--	--	3.1	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	3.0	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	3.0	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	2.9	--	--	--	--	--	--	--

--: Not detected
*: Not sampled, no water over screen
TB: Compound detected in associated trip blank
B: Compound detected in the laboratory method blank
NA: Not analyzed
NE: Not established
1: Wells installed June-August 1997
2: California Department of Health Services Interim Action Level
a: Only VOCs for which MCLs have been established are listed
E: Estimated concentration; result exceeded calibration range

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(concentrations in µg/l)

Values above state and/or federal MCLs or action levels are in bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
MW-22[1]											
Screen 1	Sep/Oct 1997	--	--	2.0	0.7	--	--	--	--	--	--
Screen 2	Sep/Oct 1997	--	--	--	--	--	--	--	--	0.8 Dichloromethane	--
Screen 3	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	15
Screen 4	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
Screen 5	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
MW-23[1]											
Screen 1	Sep/Oct 1997	--	3.1	0.6	0.8	--	--	--	--	--	4.4
Screen 2	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	7.6
Screen 3	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
Screen 4	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
Screen 5	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
MW-24[1]											
Screen 1	Sep/Oct 1997	**5.0**	**5.0**	--	--	--	--	0.6	3.1	--	**92**
Screen 2	Sep/Oct 1997	**13**	1.3	--	--	--	--	--	3.8	--	**200**
Screen 3	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
Screen 4	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
Screen 5	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
Practical Quantitation Limit		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	4.0
California Maximum Contaminant Level		0.5	5.0	5.0	5.0	0.5	6.0	1,200	100	150 Freon 11[a]	18[2]
EPA Region IX Maximum Contaminant Level		5.0	5.0	5.0	NE	5.0	7.0	NE	100	5.0 Dichloromethane[a]	NE

--: Not detected
*: Not sampled, no water over screen
TB: Compound detected in associated trip blank
B: Compound detected in the laboratory method blank
NA: Not analyzed
NE: Not established
1: Wells installed June-August 1997
2: California Department of Health Services Interim Action Level
a: Only VOCs for which MCLs have been established are listed
E: Estimated concentration; result exceeded calibration range

TABLE 3-5

SUMMARY OF METALS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, SEPTEMBER-OCTOBER 1997

(concentrations in mg/l)
Values equal to or above state MCLs are in bold and shaded

Sample Location	Sample Number	Arsenic	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-1	MW-973-1	--	--	--	0.73
MW-3					
Screen 1	MW-973-2	--	--	--	2.12
Screen 2	MW-973-3	--	--	--	2.11
Screen 3	MW-973-4	--	--	--	4.97
Screen 4	MW-973-5	--	--	--	2.45
Screen 5	MW-973-6	0.010	--	--	0.96
MW-4					
Screen 1	MW-973-7	--	--	--	4.76
Screen 2	MW-973-8	--	0.012	--	3.51
Screen 2 (DUP)	MW-973-9	--	0.011	--	3.51
Screen 3	MW-973-10	--	--	--	1.42
Screen 4	MW-973-11	--	--	--	3.28
Screen 5	MW-973-12	--	--	--	3.92
MW-5	MW-973-13	--	--	--	1.00
MW-6	MW-973-14	--	--	--	1.78
MW-7	MW-973-15	--	0.018	--	0.77
MW-8	MW-973-16	--	--	--	4.20
MW-9	MW-973-17	--	--	--	1.03
MW-10	MW-973-18	--	--	--	3.23
MW-10 DUP	MW-973-19	--	--	--	3.23
MW-11					
Screen 1	MW-973-20	--	--	--	4.64
Screen 2	MW-973-21	--	--	--	3.00
Screen 3	MW-973-22	--	--	--	3.02
Screen 4	MW-973-23	--	--	--	4.95
Screen 5	MW-973-24	--	--	--	2.55
MW-12					
Screen 1	Not Sampled*				
Screen 2	MW-973-27	--	--	--	3.37
Screen 3	MW-973-28	--	--	--	4.18
Screen 4	MW-973-29	--	--	--	1.58
Screen 5	MW-973-30	--	--	--	0.99

(DUP): Duplicate
NE: Not established
*: Not Sampled: No water over screen
--: Not detected

TABLE 3-5

SUMMARY OF METALS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, SEPTEMBER-OCTOBER 1997

(concentrations in mg/l)
Values equal to or above state MCLs are in bold and shaded

Sample Location	Sample Number	Arsenic	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-13	MW-973-31	--	**0.050**	0.045	2.36
MW-13 DUP	MW-973-32	--	**0.055**	0.045	2.36
MW-14					
Screen 1	MW-973-33	--	--	--	3.89
Screen 2	MW-973-34	--	--	--	3.22
Screen 3	MW-973-35	--	--	--	2.94
Screen 4	MW-973-36	--	--	--	1.73
Screen 5	MW-973-37	--	--	--	3.80
MW-15	MW-973-38	--	--	--	0.94
MW-16	Not Sampled*				
MW-17					
Screen 1	MW-973-40	--	--	--	1.30
Screen 2	MW-973-41	--	--	--	1.23
Screen 3	MW-973-42	--	--	0.006	2.54
Screen 4	MW-973-43	--	--	--	3.57
Screen 5	MW-973-44	--	--	--	4.83
MW-18					
Screen 1	Not Sampled*				
Screen 2	MW-973-46	--	--	--	1.43
Screen 3	MW-973-47	--	--	--	2.05
Screen 4	MW-973-48	--	--	--	1.12
Screen 5	MW-973-49	--	--	--	1.65
MW-19					
Screen 1	MW-973-50	--	--	--	4.63
Screen 2	MW-973-51	--	--	--	4.57
Screen 3	MW-973-52	--	--	--	2.02
Screen 4	MW-973-53	--	--	--	4.82
Screen 5	MW-973-54	--	--	--	4.98
MW-20					
Screen 1	Not Sampled*				
Screen 2	MW-973-56	--	--	--	3.57
Screen 3	MW-973-57	--	--	--	4.56
Screen 4	MW-973-58	--	--	--	1.35
Screen 5	MW-973-59	--	--	--	3.50

(DUP): Duplicate
NE: Not established

*: Not Sampled: No water over screen
--: Not detected

TABLE 3-5

SUMMARY OF METALS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, SEPTEMBER-OCTOBER 1997

(concentrations in mg/l)
Values equal to or above state MCLs are in bold and shaded

Sample Location	Sample Number	Arsenic	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-21					
Screen 1	Not Sampled*				
Screen 2	MW-973-61	--	--	--	0.75
Screen 3	MW-973-62	--	--	--	3.16
Screen 4	MW-973-63	--	--	--	4.51
Screen 5	MW-973-64	--	--	--	12.19
MW-22					
Screen 1	MW-973-65	--	--	--	33.8
Screen 2	MW-973-66	--	--	--	4.90
Screen 3	MW-973-67	--	--	--	2.96
Screen 4	MW-973-68	--	--	--	2.79
Screen 5	MW-973-69	--	--	--	4.41
MW-23					
Screen 1	MW-973-70	--	--	--	3.44
Screen 2	MW-973-71	--	--	--	4.92
Screen 3	MW-973-72	--	--	--	3.04
Screen 4	MW-973-73	--	--	--	4.88
Screen 5	MW-973-74	--	--	--	1.76
MW-24					
Screen 1	MW-973-75	--	--	--	1.56
Screen 2	MW-973-76	--	--	--	4.36
Screen 3	MW-973-77	--	--	--	4.63
Screen 4	MW-973-78	--	--	--	4.03
Screen 5	MW-973-79	--	--	--	4.79
Practical Quantitation Limit		0.005	0.01	0.005	
California Maximum Contaminant Level		0.05	0.05	NE	
EPA Maximum Contaminant Level		0.05	0.1	NE	

(DUP): Duplicate
NE: Not established

*: Not Sampled: No water over screen
--: Not detected

TABLE 3-6

SUMMARY OF METALS DETECTED DURING LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/l)
Values equal to or above state MCLs are in bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-1	Aug/Sep 1996	--	--	--	--	0.8
	Oct/Nov 1996	--	--	--	--	0.5
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	--	--	--	--	1.92
	Sep/Oct 1997	--	--	--	--	0.73
MW-3						
Screen 1	Aug/Sep 1996	--	--	--	--	7.2
	Oct/Nov 1996	--	--	--	--	3.1
	Feb/Mar 1997	--	--	--	--	6.1
	Jun/Jul 1997	--	--	--	--	2.61
	Sep/Oct 1997	--	--	--	--	2.12
Screen 2	Aug/Sep 1996	--	--	--	--	1.7
	Oct/Nov 1996	--	--	--	--	2.7
	Feb/Mar 1997	--	--	--	--	3.8
	Jun/Jul 1997	--	--	--	--	1.13
	Sep/Oct 1997	--	--	--	--	2.11
Screen 3	Aug/Sep 1996	--	--	--	--	5.2
	Oct/Nov 1996	--	--	--	--	2.7
	Feb/Mar 1997	--	--	--	--	1.7
	Jun/Jul 1997	--	--	--	--	3.41
	Sep/Oct 1997	--	--	--	--	4.97
Screen 4	Aug/Sep 1996	--	--	--	--	4.3
	Oct/Nov 1996	--	--	--	--	2.6
	Feb/Mar 1997	--	--	--	--	4.5
	Jun/Jul 1997	--	--	--	--	2.71
	Sep/Oct 1997	--	--	--	--	2.45
Screen 5	Aug/Sep 1996	0.011	--	--	--	1.5
	Oct/Nov 1996	0.007	--	--	--	1.9
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	0.007	--	--	--	0.83
	Sep/Oct 1997	0.010	--	--	--	0.96
MW-4						
Screen 1	Aug/Sep 1996	--	--	--	--	2.6
	Oct/Nov 1996	--	--	--	--	1.7
	Feb/Mar 1997	--	--	--	--	4.6
	Jun/Jul 1997	--	--	--	--	2.79
	Sep/Oct 1997	--	--	--	--	4.76
Screen 2	Aug/Sep 1996	--	--	0.023	--	3.8
	Oct/Nov 1996	--	--	0.014	--	4.2
	Feb/Mar 1997	--	--	0.011	--	4.5
	Jun/Jul 1997	--	--	0.013	--	2.69
	Sep/Oct 1997	--	--	0.012	--	3.51

NA: Not analyzed
NE: Not established
1: Wells installed June-August 1997
a: Treatment technique and public notification triggered at 0.015 mg/l
--: Not detected
*: Not sampled, no water over screen

TABLE 3-6

SUMMARY OF METALS DETECTED DURING LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/l)
Values equal to or above state MCLs are in bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 3	Aug/Sep 1996	--	--	--	--	0.6
	Oct/Nov 1996	--	--	--	--	1.5
	Feb/Mar 1997	--	--	--	--	2.8
	Jun/Jul 1997	--	--	--	--	1.98
	Sep/Oct 1997	--	--	--	--	1.42
Screen 4	Aug/Sep 1996	--	--	--	--	3.0
	Oct/Nov 1996	--	--	--	--	1.4
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	--	--	--	--	4.62
	Sep/Oct 1997	--	--	--	--	3.28
Screen 5	Aug/Sep 1996	--	--	--	--	4.5
	Oct/Nov 1996	--	--	--	--	4.1
	Feb/Mar 1997	--	--	--	--	4.4
	Jun/Jul 1997	--	--	--	--	3.98
	Sep/Oct 1997	--	--	--	--	3.92
MW-5	Aug/Sep 1996	--	--	--	--	2.7
	Oct/Nov 1996	--	0.003	--	--	2.7
	Feb/Mar 1997	--	--	--	--	1.5
	Jun/Jul 1997	--	--	--	--	4.50
	Sep/Oct 1997	--	--	--	--	1.00
MW-6	Aug/Sep 1996	--	--	0.050	--	4.5
	Oct/Nov 1996	--	--	0.011	--	1.1
	Feb/Mar 1997	--	--	0.014	--	4.3
	Jun/Jul 1997	--	--	0.019	--	2.50
	Sep/Oct 1997	--	--	--	--	1.78
MW-7	Aug/Sep 1996	--	--	0.013	0.007	4.8
	Oct/Nov 1996	--	--	0.019	0.019	3.5
	Feb/Mar 1997	--	--	--	0.010	2.2
	Jun/Jul 1997	--	--	--	--	0.98
	Sep/Oct 1997	--	--	0.018	--	0.77
MW-8	Aug/Sep 1996	--	--	--	--	4.0
	Oct/Nov 1996	--	0.003	--	--	4.7
	Feb/Mar 1997	--	--	--	--	3.1
	Jun/Jul 1997	--	0.002	--	--	4.61
	Sep/Oct 1997	--	--	--	--	4.20
MW-9	Aug/Sep 1996	--	--	--	--	2.1
	Oct/Nov 1996	--	--	--	--	2.5
	Feb/Mar 1997	--	--	--	--	4.2
	Jun/Jul 1997	--	--	--	--	3.22
	Sep/Oct 1997	--	--	--	--	1.03

NA: Not analyzed
NE: Not established
1: Wells installed June-August 1997
a: Treatment technique and public notification triggered at 0.015 mg/l
--: Not detected
*: Not sampled, no water over screen

TABLE 3-6

SUMMARY OF METALS DETECTED DURING LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/l)
Values equal to or above state MCLs are in bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-10	Aug/Sep 1996	--	--	0.011	0.010	4.5
	Oct/Nov 1996	--	0.003	0.011	--	4.9
	Feb/Mar 1997	--	--	--	--	2.2
	Jun/Jul 1997	--	--	0.014	--	2.92
	Sep/Oct 1997	--	--	--	--	3.23
MW-11						
Screen 1	Aug/Sep 1996	--	--	--	--	4.0
	Oct/Nov 1996	--	--	--	--	2.5
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	--	--	--	--	1.53
	Sep/Oct 1997	--	--	--	--	4.64
Screen 2	Aug/Sep 1996	--	--	--	--	4.5
	Oct/Nov 1996	--	--	--	--	4.7
	Feb/Mar 1997	--	--	--	--	3.1
	Jun/Jul 1997	--	--	--	--	4.67
	Sep/Oct 1997	--	--	--	--	3.00
Screen 3	Aug/Sep 1996	--	--	--	--	0.5
	Oct/Nov 1996	--	--	--	--	2.3
	Feb/Mar 1997	--	--	--	--	1.7
	Jun/Jul 1997	--	--	--	--	1.88
	Sep/Oct 1997	--	--	--	--	3.02
Screen 4	Aug/Sep 1996	--	--	--	--	3.9
	Oct/Nov 1996	--	--	--	--	3.3
	Feb/Mar 1997	--	0.009	--	--	5.2
	Jun/Jul 1997	--	--	--	--	4.80
	Sep/Oct 1997	--	--	--	--	4.95
Screen 5	Aug/Sep 1996	0.007	--	--	--	0.6
	Oct/Nov 1996	0.005	--	--	--	1.9
	Feb/Mar 1997	--	0.002	--	--	1.6
	Jun/Jul 1997	--	--	--	--	0.69
	Sep/Oct 1997	--	--	--	--	2.55
MW-12						
Screen 1	Aug/Sep 1996	--	0.004	--	--	50.4
	Oct/Nov 1996	Not Sampled*				
	Feb/Mar 1997	--	0.003	--	--	3.8
	Jun/Jul 1997	--	--	--	--	4.80
	Sep/Oct 1997	Not Sampled*				
Screen 2	Aug/Sep 1996	--	0.024	--	--	4.0
	Oct/Nov 1996	--	--	--	--	4.0
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	--	--	--	--	3.16
	Sep/Oct 1997	--	--	--	--	3.37

NA: Not analyzed
NE: Not established
1: Wells installed June-August 1997
a: Treatment technique and public notification triggered at 0.015 mg/l
--: Not detected
*: Not sampled, no water over screen

TABLE 3-6

SUMMARY OF METALS DETECTED DURING LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/l)
Values equal to or above state MCLs are in bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 3	Aug/Sep 1996	--	--	--	--	2.5
	Oct/Nov 1996	--	--	--	--	3.1
	Feb/Mar 1997	--	--	--	--	5.0
	Jun/Jul 1997	--	--	--	--	4.79
	Sep/Oct 1997	--	--	--	--	4.18
Screen 4	Aug/Sep 1996	--	0.005	--	--	1.8
	Oct/Nov 1996	--	--	--	--	0.7
	Feb/Mar 1997	--	--	--	--	2.4
	Jun/Jul 1997	--	--	--	--	2.49
	Sep/Oct 1997	--	--	--	--	1.58
Screen 5	Aug/Sep 1996	--	--	--	--	2.0
	Oct/Nov 1996	--	--	--	--	2.0
	Feb/Mar 1997	--	--	--	--	1.5
	Jun/Jul 1997	--	--	--	--	4.97
	Sep/Oct 1997	--	--	--	--	0.99
MW-13	Aug/Sep 1996	--	--	0.046	0.047	4.1
	Oct/Nov 1996	--	0.005	0.031	0.028	3.0
	Feb/Mar 1997	--	--	0.032	0.035	0.5
	Jun/Jul 1997	--	--	0.038	0.037	1.21
	Sep/Oct 1997	--	--	**0.050**	0.045	2.36
MW-14						
Screen 1	Aug/Sep 1996	--	--	--	--	3.3
	Oct/Nov 1996	--	--	--	--	4.5
	Feb/Mar 1997	--	--	--	--	4.3
	Jun/Jul 1997	--	--	--	--	2.21
	Sep/Oct 1997	--	--	--	--	3.89
Screen 2	Aug/Sep 1996	--	--	--	--	4.4
	Oct/Nov 1996	--	--	--	--	3.8
	Feb/Mar 1997	--	--	--	--	4.8
	Jun/Jul 1997	--	--	--	--	4.97
	Sep/Oct 1997	--	--	--	--	3.22
Screen 3	Aug/Sep 1996	--	--	--	--	1.7
	Oct/Nov 1996	--	--	--	--	2.0
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	--	--	--	--	0.70
	Sep/Oct 1997	--	--	--	--	2.94
Screen 4	Aug/Sep 1996	--	--	--	--	3.1
	Oct/Nov 1996	--	--	--	--	2.5
	Feb/Mar 1997	--	--	--	--	4.1
	Jun/Jul 1997	--	--	--	--	2.31
	Sep/Oct 1997	--	--	--	--	1.73

NA: Not analyzed
NE: Not established
1: Wells installed June-August 1997
a: Treatment technique and public notification triggered at 0.015 mg/l
--: Not detected
*: Not sampled, no water over screen

TABLE 3-6

SUMMARY OF METALS DETECTED DURING LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/l)
Values equal to or above state MCLs are in bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 5	Aug/Sep 1996	--	--	--	--	1.5
	Oct/Nov 1996	--	--	--	--	4.1
	Feb/Mar 1997	--	0.028	--	--	2.3
	Jun/Jul 1997	--	--	--	--	1.90
	Sep/Oct 1997	--	--	--	--	3.80
MW-15	Aug/Sep 1996	--	--	--	--	1.3
	Oct/Nov 1996	--	--	NA	--	0.5
	Feb/Mar 1997	--	--	--	--	2.6
	Jun/Jul 1997	--	--	--	--	0.21
	Sep/Oct 1997	--	--	--	--	0.94
MW-16	Aug/Sep 1996	--	--	0.018	--	3.4
	Not Sampled	NA	NA	NA	NA	NA
	Feb/Mar 1997	--	--	--	0.007	0.2
	Jun/Jul 1997	--	--	--	--	0.12
	Sep/Oct 1997	Not Sampled*				
MW-17						
Screen 1	Aug/Sep 1996	--	--	NA	NA	1.0
	Oct/Nov 1996	--	--	--	--	2.9
	Feb/Mar 1997	--	--	--	--	2.0
	Jun/Jul 1997	--	--	--	--	2.23
	Sep/Oct 1997	--	--	--	--	1.30
Screen 2	Aug/Sep 1996	--	--	NA	NA	4.5
	Oct/Nov 1996	--	--	--	--	2.5
	Feb/Mar 1997	--	--	--	--	2.7
	Jun/Jul 1997	--	--	--	--	4.49
	Sep/Oct 1997	--	--	--	--	1.23
Screen 3	Aug/Sep 1996	--	0.002	NA	NA	4.9
	Oct/Nov 1996	--	--	--	--	4.8
	Feb/Mar 1997	--	--	--	--	6.0
	Jun/Jul 1997	--	--	--	--	4.83
	Sep/Oct 1997	--	--	--	0.006	2.54
Screen 4	Aug/Sep 1996	--	--	NA	NA	2.8
	Oct/Nov 1996	--	--	--	--	2.6
	Feb/Mar 1997	--	--	--	--	5.6
	Jun/Jul 1997	--	--	--	--	4.09
	Sep/Oct 1997	--	--	--	--	3.57
Screen 5	Aug/Sep 1996	--	--	NA	NA	5.0
	Oct/Nov 1996	--	0.005	--	--	5.2
	Feb/Mar 1997	--	0.003	--	--	24.5
	Jun/Jul 1997	--	--	--	--	34.0
	Sep/Oct 1997	--	--	--	--	4.83

NA: Not analyzed
NE: Not established
1: Wells installed June-August 1997
a: Treatment technique and public notification triggered at 0.015 mg/l
--: Not detected
*: Not sampled, no water over screen

TABLE 3-6

SUMMARY OF METALS DETECTED DURING LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/l)
Values equal to or above state MCLs are in bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-18						
Screen 1	Aug/Sep 1996	--	--	NA	NA	0.9
	Not Sampled	NA	NA	NA	NA	NA
	Feb/Mar 1997	--	--	--	--	1.9
	Jun/Jul 1997	--	--	--	--	0.42
	Sep/Oct 1997	Not Sampled*				
Screen 2	Aug/Sep 1996	--	--	NA	NA	3.5
	Oct/Nov 1996	--	0.003	--	--	3.4
	Feb/Mar 1997	--	--	--	--	2.8
	Jun/Jul 1997	--	--	--	--	1.53
	Sep/Oct 1997	--	--	--	--	1.43
Screen 3	Aug/Sep 1996	--	--	NA	NA	4.2
	Oct/Nov 1996	--	0.002	NA	--	4.0
	Feb/Mar 1997	--	--	0.015	0.007	3.3
	Jun/Jul 1997	--	--	--	--	3.88
	Sep/Oct 1997	--	--	--	--	2.05
Screen 4	Aug/Sep 1996	--	--	NA	NA	2.0
	Oct/Nov 1996	--	0.003	--	--	1.9
	Feb/Mar 1997	--	--	--	--	2.8
	Jun/Jul 1997	0.005	--	--	--	3.58
	Sep/Oct 1997	--	--	--	--	1.12
Screen 5	Aug/Sep 1996	--	--	NA	NA	2.8
	Oct/Nov 1996	--	0.002	--	--	3.6
	Feb/Mar 1997	--	--	--	--	2.9
	Jun/Jul 1997	--	--	--	--	3.97
	Sep/Oct 1997	--	--	--	--	1.65
MW-19						
Screen 1	Aug/Sep 1996	--	--	NA	NA	5.0
	Oct/Nov 1996	--	--	--	--	3.4
	Feb/Mar 1997	--	--	--	--	6.6
	Jun/Jul 1997	--	--	--	--	0.78
	Sep/Oct 1997	--	--	--	--	4.63
Screen 2	Aug/Sep 1996	--	--	NA	NA	4.5
	Oct/Nov 1996	--	--	--	--	3.6
	Feb/Mar 1997	--	--	--	--	21.9
	Jun/Jul 1997	--	--	--	--	2.80
	Sep/Oct 1997	--	--	--	--	4.57
Screen 3	Aug/Sep 1996	--	--	NA	NA	3.0
	Oct/Nov 1996	--	--	--	--	5.0
	Feb/Mar 1997	--	--	--	--	4.9
	Jun/Jul 1997	--	--	--	--	4.88
	Sep/Oct 1997	--	--	--	--	2.02

NA: Not analyzed
NE: Not established
1: Wells installed June-August 1997
a: Treatment technique and public notification triggered at 0.015 mg/l
--: Not detected
*: Not sampled, no water over screen

TABLE 3-6

SUMMARY OF METALS DETECTED DURING LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/l)
Values equal to or above state MCLs are in bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 4	Aug/Sep 1996	--	--	NA	NA	4.2
	Oct/Nov 1996	--	--	--	--	8.0
	Feb/Mar 1997	--	0.003	--	--	15.8
	Jun/Jul 1997	--	--	--	--	4.88
	Sep/Oct 1997	--	--	--	--	4.82
Screen 5	Aug/Sep 1996	--	--	NA	NA	4.9
	Oct/Nov 1996	--	--	NA	--	4.6
	Feb/Mar 1997	--	--	--	--	3.8
	Jun/Jul 1997	--	--	--	--	2.15
	Sep/Oct 1997	--	--	--	--	4.98
MW-20						
Screen 1	Aug/Sep 1996	--	--	--	NA	3.5
	Not Sampled	NA	NA	NA	NA	NA
	Feb/Mar 1997	--	--	--	--	2.3
	Jun/Jul 1997	--	--	--	--	0.16
	Sep/Oct 1997	Not Sampled*				
Screen 2	Aug/Sep 1996	--	--	NA	NA	3.9
	Oct/Nov 1996	--	--	--	--	1.1
	Feb/Mar 1997	--	--	--	--	2.1
	Jun/Jul 1997	--	--	--	--	2.54
	Sep/Oct 1997	--	--	--	--	3.57
Screen 3	Aug/Sep 1996	--	--	NA	NA	1.7
	Oct/Nov 1996	--	--	--	--	1.6
	Feb/Mar 1997	--	--	--	--	1.9
	Jun/Jul 1997	--	--	--	--	2.14
	Sep/Oct 1997	--	--	--	--	4.56
Screen 4	Aug/Sep 1996	--	--	NA	NA	1.0
	Oct/Nov 1996	--	--	--	--	1.3
	Feb/Mar 1997	--	--	--	--	3.3
	Jun/Jul 1997	--	--	--	--	1.29
	Sep/Oct 1997	--	--	--	--	1.35
Screen 5	Aug/Sep 1996	--	--	NA	NA	1.8
	Oct/Nov 1996	--	--	NA	--	1.3
	Feb/Mar 1997	--	0.004	--	--	1.6
	Jun/Jul 1997	0.006	--	--	--	1.94
	Sep/Oct 1997	--	--	--	--	3.50
MW-21						
Screen 1	Aug/Sep 1996	--	--	NA	NA	0.9
	Not Sampled	NA	NA	NA	NA	NA
	Feb/Mar 1997	--	--	--	--	1.1
	Jun/Jul 1997	--	--	--	--	2.76
	Sep/Oct 1997	Not Sampled*				

NA: Not analyzed
NE: Not established
1: Wells installed June-August 1997
a: Treatment technique and public notification triggered at 0.015 mg/l
--: Not detected
*: Not sampled, no water over screen

TABLE 3-6

SUMMARY OF METALS DETECTED DURING LONG-TERM QUARTERLY SAMPLING PROGRAM, JET PROPULSION LABORATORY

(concentrations in mg/l)
Values equal to or above state MCLs are in bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 2	Aug/Sep 1996	--	--	NA	NA	2.1
	Oct/Nov 1996	--	--	--	--	1.2
	Feb/Mar 1997	--	--	--	--	3.9
	Jun/Jul 1997	--	--	--	--	1.68
	Sep/Oct 1997	--	--	--	--	0.75
Screen 3	Aug/Sep 1996	--	--	NA	NA	4.6
	Oct/Nov 1996	--	--	--	--	4.9
	Feb/Mar 1997	--	0.003	--	--	4.6
	Jun/Jul 1997	--	--	--	--	1.40
	Sep/Oct 1997	--	--	--	--	3.16
Screen 4	Aug/Sep 1996	--	--	NA	NA	2.5
	Oct/Nov 1996	--	--	--	--	3.3
	Feb/Mar 1997	--	0.004	--	--	4.4
	Jun/Jul 1997	--	--	--	--	2.46
	Sep/Oct 1997	--	--	--	--	4.51
Screen 5	Aug/Sep 1996	--	--	NA	NA	4.9
	Oct/Nov 1996	--	--	--	--	5.0
	Feb/Mar 1997	--	--	--	--	28.0
	Jun/Jul 1997	--	--	--	--	26.4
	Sep/Oct 1997	--	--	--	--	12.19
MW-22[1]						
Screen 1	Sep/Oct 1997	--	--	--	--	33.8
Screen 2	Sep/Oct 1997	--	--	--	--	4.90
Screen 3	Sep/Oct 1997	--	--	--	--	2.96
Screen 4	Sep/Oct 1997	--	--	--	--	2.79
Screen 5	Sep/Oct 1997	--	--	--	--	4.41
MW-23[1]						
Screen 1	Sep/Oct 1997	--	--	--	--	3.44
Screen 2	Sep/Oct 1997	--	--	--	--	4.92
Screen 3	Sep/Oct 1997	--	--	--	--	3.04
Screen 4	Sep/Oct 1997	--	--	--	--	4.88
Screen 5	Sep/Oct 1997	--	--	--	--	1.76
MW-24[1]						
Screen 1	Sep/Oct 1997	--	--	--	--	1.56
Screen 2	Sep/Oct 1997	--	--	--	--	4.36
Screen 3	Sep/Oct 1997	--	--	--	--	4.63
Screen 4	Sep/Oct 1997	--	--	--	--	4.03
Screen 5	Sep/Oct 1997	--	--	--	--	4.79
Practical Quantitation Limit		0.005	0.002	0.01	0.005	
Calif. Maximum Contaminant Level		0.05	0.05	0.05	NE	
EPA Maximum Contaminant Level		0.05	(a)	0.10	NE	

NA: Not analyzed
NE: Not established
1: Wells installed June-August 1997
a: Treatment technique and public notification triggered at 0.015 mg/l
--: Not detected
*: Not sampled, no water over screen

TABLE 4-1

SUMMARY OF WATER-CHEMISTRY RESULTS FOR GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, SEPTEMBER-OCTOBER 1997

(concentrations in mg/L)

Well Number	ANIONS					CATIONS					Measured Alkalinity	Measured pH
	Cl	CO_3	HCO_3	NO_3-N	SO_4	Na	Mg	K	Ca	Fe		
MW-1	19	0.713	219	1.4	46	28	16	3.8	57	--	180	7.7
MW-3												
Screen 1	7.6	0.473	183	0.5	24	17	13	2.5	41	0.14	150	7.6
Screen 2	13	0.450	219	0.9	37	19	16	2.7	53	0.17	180	7.5
Screen 3	20	6.64	162	0.2	19	39	11	2.9	21	0.66	135	8.8
Screen 4	9.6	4.37	169	0.4	15	46	7.9	2.1	17	0.30	140	8.6
Screen 5	9.6	0.189	146	--	25	66	1.1	1.2	8.6	--	120	8.8
MW-4												
Screen 1	21	0.164	159	1.4	30	20	13	3.2	50	--	130	7.2
Screen 2	69	0.237	183	8.2	73	27	25	2.7	84	0.81	150	7.3
Screen 3	20	1.49	182	6.9	9.9	33	12	2.1	49	--	150	8.1
Screen 4	14	1.49	182	3.5	7.7	40	9.5	2.2	37	0.25	150	8.1
Screen 5	8.6	1.64	201	0.9	18	36	9.1	2.2	44	0.38	165	8.1
MW-5	22	0.068	165	2.2	51	17	15	3.5	51	--	135	6.8
MW-6	49	0.160	195	5.4	47	23	20	2.0	66	0.26	160	7.1
MW-7	22	0.458	177	6.3	44	18	16	3.0	55	--	145	7.6
MW-8	16	0.170	165	3.7	46	17	14	2.9	50	0.11	135	7.2
MW-9	19	0.348	268	--	50	24	20	4	70	--	220	7.3
MW-10	92	0.100	244	17	150	28	39	3.6	115	0.13	200	6.8
MW-11												
Screen 1	15	1.94	237	0.30	43	24	19	3.7	59	0.76	195	8.1
Screen 2	14	1.64	201	0.40	34	22	17	3.4	50	0.24	165	8.1
Screen 3	12	2.59	200	0.20	25	26	13	2.5	49	--	165	8.3
Screen 4	10	2.52	194	--	21	24	12	2.6	46	1.15	160	8.3
Screen 5	11	2.05	158	--	17	47	2.0	1.3	31	0.17	130	8.3
MW-12												
Screen 1	Not Sampled [1]											
Screen 2	15	0.45	219	2.0	41	24	17	3.5	60	0.67	180	7.5
Screen 3	18	1.42	219	1.2	35	24	15	3.2	59	0.47	180	8.0
Screen 4	14	1.16	225	1.3	31	23	13	2.6	63	0.28	185	7.9
Screen 5	13	1.74	213	1.0	19	36	11	2.4	46	--	175	8.1
MW-13	38	0.214	165	2.9	66	23	19	3.0	69	0.37	135	7.3
MW-14												
Screen 1	115	0.170	262	19	185	47	44	3.0	140	1.40	215	7.0
Screen 2	120	0.290	354	14	180	36	54	3.1	160	1.90	290	7.1
Screen 3	85	0.947	231	13	105	38	40	3.6	100	--	190	7.8
Screen 4	31	0.945	183	10	20	28	17	2.3	62	0.14	150	7.9
Screen 5	5.2	5.47	168	0.5	9.5	36	11	2.6	21	0.64	140	8.7

--: Not detected

1: Not sampled, no water over screen

TABLE 4-1

SUMMARY OF WATER-CHEMISTRY RESULTS FOR GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, SEPTEMBER-OCTOBER 1997

(concentrations in mg/L)

Well Number	ANIONS					CATIONS					Measured Alkalinity	Measured pH
	Cl	CO_3	HCO_3	NO_3-N	SO_4	Na	Mg	K	Ca	Fe		
MW-15	24	0.264	256	0.9	47	24	19	3.7	66	0.11	210	7.2
MW-16	Not Sampled (1)											
MW-17												
Screen 1	5.7	0.238	146	0.6	25	13	11	2.1	36	--	120	7.4
Screen 2	6.8	10.1	124	--	22	17	16	2.8	14	--	105	9.1
Screen 3	14	0.800	195	1.7	29	21	16	2.0	43	0.61	160	7.8
Screen 4	11	0.898	219	1.9	25	33	12	1.7	45	0.73	180	7.8
Screen 5	11	1.38	213	1.9	26	34	12	1.7	43	0.82	175	8.0
MW-18												
Screen 1	Not Sampled (1)											
Screen 2	11	0.261	201	1.1	36	18	15	2.9	57	0.14	165	7.3
Screen 3	13	2.13	207	0.2	30	23	18	3.4	46	0.11	170	8.2
Screen 4	8.6	1.64	201	0.7	22	32	9.7	1.6	47	0.38	165	8.1
Screen 5	10	13.0	159	--	5.9	52	4.6	1.7	7.7	--	135	9.1
MW-19												
Screen 1	6.1	0.325	158	0.8	23	12	12	2.5	37	--	130	7.5
Screen 2	28	0.091	177	3.2	48	14	19	1.9	55	--	145	6.9
Screen 3	70	0.251	244	9.0	66	29	30	2.6	86	0.62	200	7.2
Screen 4	37	0.631	244	4.8	50	26	24	2.2	70	1.30	200	7.6
Screen 5	57	0.853	262	6.9	57	30	29	2.4	84	1.10	215	7.7
MW-20												
Screen 1	Not Sampled (1)											
Screen 2	11	14.4	140	0.3	26	38	12	2.2	12	0.50	120	9.2
Screen 3	25	5.15	199	1.1	18	55	12	2.4	20	--	165	8.6
Screen 4	10	5.08	156	--	17	58	2.9	1.1	10	0.12	130	8.7
Screen 5	8.3	18.6	181	--	20	75	1.6	1.4	7.3	--	155	9.2
MW-21												
Screen 1	Not Sampled (1)											
Screen 2	120	0.557	341	7.2	140	52	42	3.5	125	0.10	280	7.4
Screen 3	87	0.488	299	9.6	87	37	34	3.4	115	0.32	245	7.4
Screen 4	55	0.398	244	8.6	55	29	25	2.8	96	0.23	200	7.4
Screen 5	61	0.647	250	9.8	73	32	27	3.1	99	1.14	205	7.6
MW-22												
Screen 1	92	0.398	244	8.7	120	30	37	3.6	120	--	200	7.4
Screen 2	57	0.551	213	9.7	58	32	25	3.1	69	0.69	175	7.6
Screen 3	28	1.19	183	8.7	18	33	14	2.3	46	0.47	150	8.0
Screen 4	12	0.878	170	4.2	8.2	28	9.6	1.9	35	0.31	140	7.9
Screen 5	11	4.30	132	--	57	73	3.0	1.8	11	1.53	110	8.7

--: Not detected

1: Not sampled, no water over screen

TABLE 4-1

SUMMARY OF WATER-CHEMISTRY RESULTS FOR GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, SEPTEMBER-OCTOBER 1997

(concentrations in mg/L)

Well Number	ANIONS					CATIONS					Measured Alkalinity	Measured pH
	Cl	CO_3	HCO_3	NO_3-N	SO_4	Na	Mg	K	Ca	Fe		
MW-23												
Screen 1	110	0.395	305	14	160	34	45	3.7	130	0.40	250	7.3
Screen 2	98	0.301	232	14	130	35	36	3.3	105	2.00	190	7.3
Screen 3	24	0.557	171	9.3	14	27	14	2.1	45	4.40	140	7.7
Screen 4	13	0.515	158	5.1	7.9	27	10	2.2	33	0.57	130	7.7
Screen 5	40	7.87	192	--	70	95	6.1	4.1	22	0.40	160	8.8
MW-24												
Screen 1	14	2.13	164	2.5	37	23	16	3.3	39	0.26	135	8.3
Screen 2	38	1.75	170	2.2	19	39	13	3.4	38	0.58	140	8.2
Screen 3	26	0.616	189	1.7	16	41	12	2.4	39	0.61	155	7.7
Screen 4	12	1.23	189	2.6	11	39	9.5	2.6	33	0.37	155	8.0
Screen 5	9.0	1.10	213	0.9	23	40	8.9	2.3	43	4.33	175	7.9
Detection Limit	1.0	0.001	0.001	0.10	2.0	1.0	1.0	1.0	1.0	0.10	2.0	

--: Not detected

1: Not sampled, no water over screen

TABLE 4-2

SUMMARY OF QUALITY CONTROL ANALYSES OF WATER-CHEMISTRY DATA FROM GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, SEPTEMBER-OCTOBER 1997

Well Number	Total Anions	Total Cations	Total Ions	Charge Balance	Measured TDS	Calculated TDS	Measured TDS/ Calculated TDS
MW-1	5.19	5.48	10.67	2.72	310	280	1.1
MW-3							
Screen 1	3.75	3.92	7.67	2.22	240	196	1.2
Screen 2	4.80	4.86	9.66	0.62	280	250	1.2
Screen 3	3.67	3.73	7.40	0.81	230	200	1.2
Screen 4	3.41	3.55	6.96	2.01	220	186	1.2
Screen 5	3.19	3.42	6.61	3.47	230	177	**1.3**
MW-4							
Screen 1	3.92	4.52	8.44	**7.11**	260	217	1.2
Screen 2	7.05	7.50	14.55	3.09	460	380	1.2
Screen 3	4.26	4.93	9.19	**7.29**	260	224	1.2
Screen 4	3.81	4.43	8.24	**7.52**	230	205	1.1
Screen 5	3.98	4.57	8.55	**6.90**	240	220	1.1
MW-5	4.54	4.61	9.15	0.76	300	243	1.2
MW-6	5.95	6.00	11.95	0.42	370	309	1.2
MW-7	4.89	4.93	9.82	0.41	320	252	**1.3**
MW-8	4.37	4.47	8.84	1.13	280	231	1.2
MW-9	5.98	6.29	12.27	2.52	350	319	1.1
MW-10	10.9	10.3	21.2	2.83	660	565	1.2
MW-11							
Screen 1	5.24	5.65	10.89	3.76	330	283	1.2
Screen 2	4.43	4.94	9.37	**5.44**	270	242	1.1
Screen 3	4.17	4.71	8.88	**6.08**	270	229	1.2
Screen 4	3.92	4.40	8.32	**5.77**	240	215	1.1
Screen 5	3.26	3.79	7.05	**7.52**	220	189	1.2
MW-12							
Screen 1	Not Sampled[1]						
Screen 2	5.02	5.53	10.55	4.83	320	271	1.2
Screen 3	4.92	5.31	10.23	3.81	300	265	1.1
Screen 4	4.83	5.29	10.12	4.54	310	260	1.2
Screen 5	4.33	4.83	9.16	**5.46**	260	235	1.1
MW-13	5.35	6.09	11.44	**6.47**	360	303	1.2
MW-14							
Screen 1	12.8	12.7	25.5	0.39	820	683	1.2
Screen 2	13.9	14.1	28.0	0.72	930	743	**1.3**
Screen 3	9.31	10.0	19.31	3.57	590	499	1.2
Screen 4	5.01	5.78	10.79	**7.14**	350	261	**1.3**
Screen 5	3.18	3.59	6.77	**6.06**	200	175	1.1

Note: Shaded areas represent values that fall outside the ideal range for each particular QA/QC test.

1: Not sampled, no water over screen

TABLE 4-2

SUMMARY OF QUALITY CONTROL ANALYSES OF WATER-CHEMISTRY DATA FROM GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, SEPTEMBER-OCTOBER 1997

Well Number	Total Anions	Total Cations	Total Ions	Charge Balance	Measured TDS	Calculated TDS	Measured TDS/ Calculated TDS
MW-15	5.92	6.00	11.92	0.67	340	310	1.1
MW-16	Not Sampled(1)						
MW-17							
Screen 1	3.12	3.32	6.44	3.11	180	165	1.1
Screen 2	2.75	2.83	5.58	1.43	160	150	1.1
Screen 3	4.32	4.43	8.75	1.26	240	224	1.1
Screen 4	4.57	4.72	9.29	1.61	270	239	1.1
Screen 5	4.49	4.66	9.15	1.86	240	237	1.0
MW-18							
Screen 1	Not Sampled(1)						
Screen 2	4.44	4.94	9.38	**5.33**	270	240	1.1
Screen 3	4.41	4.87	9.28	4.96	270	238	1.1
Screen 4	4.05	4.58	8.63	**6.14**	250	222	1.1
Screen 5	3.11	3.07	6.18	0.65	180	173	1.0
MW-19							
Screen 1	3.31	3.42	6.73	1.78	180	171	1.0
Screen 2	4.92	4.97	9.89	0.51	290	256	1.1
Screen 3	7.99	8.10	16.09	0.68	460	413	1.1
Screen 4	6.43	6.66	13.09	1.76	390	336	1.2
Screen 5	7.59	7.95	15.54	2.32	450	397	1.1
MW-20							
Screen 1	Not Sampled(1)						
Screen 2	3.27	3.30	6.57	0.46	210	185	1.1
Screen 3	4.46	4.44	8.90	0.22	290	236	1.2
Screen 4	3.24	3.29	6.53	0.76	190	181	1.0
Screen 5	3.75	3.79	7.54	0.53	240	221	1.1
MW-21							
Screen 1	Not Sampled(1)						
Screen 2	12.4	12.1	24.5	1.22	820	658	1.2
Screen 3	9.85	10.2	20.05	1.75	610	520	1.2
Screen 4	7.31	8.19	15.50	**5.68**	490	392	**1.3**
Screen 5	8.04	8.64	16.68	3.60	520	430	1.2
MW-22							
Screen 1	9.72	10.4	20.12	3.38	590	532	1.1
Screen 2	7.01	6.98	13.99	0.21	400	360	1.1
Screen 3	4.79	4.95	9.74	1.64	290	242	1.2
Screen 4	3.61	3.81	7.42	2.70	230	184	**1.3**
Screen 5	3.70	4.02	7.72	4.14	260	228	1.1

Note: Shaded areas represent values that fall outside the ideal range for each particular QA/QC test.

1: Not sampled, no water over screen

TABLE 4-2

SUMMARY OF QUALITY CONTROL ANALYSES OF WATER-CHEMISTRY DATA FROM GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, SEPTEMBER-OCTOBER 1997

Well Number	Total Anions	Total Cations	Total Ions	Charge Balance	Measured TDS	Calculated TDS	Measured TDS/ Calculated TDS
MW-23							
Screen 1	12.4	11.8	24.20	2.48	730	647	1.1
Screen 2	10.3	9.82	20.12	2.38	600	538	1.1
Screen 3	4.43	4.63	9.06	2.21	280	224	**1.3**
Screen 4	3.50	3.70	7.20	2.78	220	177	1.2
Screen 5	5.79	5.84	11.63	0.43	360	340	1.1
MW-24							
Screen 1	4.04	4.35	8.39	3.69	250	218	1.1
Screen 2	4.42	4.75	9.17	3.60	280	239	1.2
Screen 3	4.29	4.78	9.07	**5.40**	280	232	1.2
Screen 4	3.85	4.19	8.04	4.23	180	204	**0.9**
Screen 5	4.30	4.68	8.98	4.23	210	237	**0.9**

Note: Shaded areas represent values that fall outside the ideal range for each particular QA/QC test.

1: Not sampled, no water over screen

TABLE 5-1
GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS
September 9, 1997

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-1		9/9/97	35.69	1116.69	1081.00
MW-3	1 (top)	9/9/97	149.65	1100.34	950.69
	2	9/9/97	157.87	1100.34	942.47
	3	9/9/97	161.67	1100.34	938.67
	4	9/9/97	233.07	1100.34	867.27
	5	9/9/97	260.74	1100.34	839.60
MW-4	1 (top)	9/9/97	129.05	1082.84	953.79
	2	9/9/97	136.80	1082.84	946.04
	3	9/9/97	139.31	1082.84	943.53
	4	9/9/97	147.69	1082.84	935.15
	5	9/9/97	220.31	1082.84	862.53
MW-5		9/9/97	116.00	1071.62	955.62
MW-6		9/9/97	219.80	1188.54	968.74
MW-7		9/9/97	255.76	1212.90	957.14
MW-8		9/9/97	181.27	1139.55	958.28
MW-9		9/9/97	27.93	1106.06	1078.13
MW-10		9/9/97	130.15	1087.73	957.58
MW-11	1 (top)	9/9/97	126.63	1139.30	1012.67
	2	9/9/97	178.64	1139.30	960.66
	3	9/9/97	194.43	1139.30	944.87
	4	9/9/97	199.40	1139.30	939.90
	5	9/9/97	259.98	1139.30	879.32
MW-12	1 (top)	9/9/97	N/W	1102.14	N/W
	2	9/9/97	153.33	1102.14	948.81
	3	9/9/97	156.41	1102.14	945.73
	4	9/9/97	168.78	1102.14	933.36
	5	9/9/97	226.36	1102.14	875.78
MW-13		9/9/97	223.97	1183.49	959.52
MW-14	1 (top)	9/9/97	202.28	1173.47	971.19
	2	9/9/97	203.17	1173.47	970.30
	3	9/9/97	203.35	1173.47	970.12
	4	9/9/97	203.44	1173.47	970.03
	5	9/9/97	204.53	1173.47	968.94
MW-15		9/9/97	40.70	1120.68	1079.98
MW-16		9/9/97	277.30	1236.29	958.99
MW-17	1 (top)	9/9/97	241.67	1191.21	949.54
	2	9/9/97	255.87	1191.21	935.34
	3	9/9/97	268.60	1191.21	922.61
	4	9/9/97	314.92	1191.21	876.29
	5	9/9/97	324.22	1191.21	866.99

TABLE 5-1
GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS
September 9, 1997

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-18	1 (top)	9/9/97	N/W	1225.41	N/W
	2	9/9/97	280.12	1225.41	945.29
	3	9/9/97	287.73	1225.41	937.68
	4	9/9/97	313.79	1225.41	911.62
	5	9/9/97	328.07	1225.41	897.34
MW-19	1 (top)	9/9/97	198.61	1142.94	944.33
	2	9/9/97	208.99	1142.94	933.95
	3	9/9/97	213.78	1142.94	929.16
	4	9/9/97	311.59	1142.94	831.35
	5	9/9/97	314.64	1142.94	828.30
MW-20	1 (top)	9/9/97	N/W	1165.05	N/W
	2	9/9/97	232.75	1165.05	932.30
	3	9/9/97	257.55	1165.05	907.50
	4	9/9/97	266.81	1165.05	898.24
	5	9/9/97	228.75	1165.05	936.30
MW-21	1 (top)	9/9/97	N/W	1059.10	N/W
	2	9/9/97	94.04	1059.10	965.06
	3	9/9/97	94.36	1059.10	964.74
	4	9/9/97	95.64	1059.10	963.46
	5	9/9/97	95.66	1059.10	963.44
MW-22	1 (top)	9/9/97	214.67	1176.98	962.31
	2	9/9/97	216.34	1176.98	960.64
	3	9/9/97	216.15	1176.98	960.83
	4	9/9/97	233.30	1176.98	943.68
	5	9/9/97	244.59	1176.98	932.39
MW-23	1 (top)	9/9/97	148.76	1108.84	960.08
	2	9/9/97	153.24	1108.84	955.60
	3	9/9/97	153.58	1108.84	955.26
	4	9/9/97	174.57	1108.84	934.27
	5	9/9/97	176.79	1108.84	932.05
MW-24	1 (top)	9/9/97	241.76	1200.94	959.18
	2	9/9/97	247.36	1200.94	953.58
	3	9/9/97	249.82	1200.94	951.12
	4	9/9/97	273.00	1200.94	927.94
	5	9/9/97	294.67	1200.94	906.27

TABLE 5-2
GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS
October 29, 1997

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-1		10/29/97	30.78	1116.69	1085.91
MW-3	1 (top)	10/29/97	156.20	1100.34	944.14
	2	10/29/97	162.34	1100.34	938.00
	3	10/29/97	165.22	1100.34	935.12
	4	10/29/97	237.03	1100.34	863.31
	5	10/29/97	265.74	1100.34	834.60
MW-4	1 (top)	10/29/97	132.66	1082.84	950.18
	2	10/29/97	139.91	1082.84	942.93
	3	10/29/97	141.82	1082.84	941.02
	4	10/29/97	150.02	1082.84	932.82
	5	10/29/97	223.93	1082.84	858.91
MW-5		10/29/97	121.13	1071.62	950.49
MW-6		10/29/97	218.67	1188.54	969.87
MW-7		10/29/97	261.46	1212.90	951.44
MW-8		10/29/97	187.21	1139.55	952.34
MW-9		10/29/97	23.94	1106.06	1082.12
MW-10		10/29/97	133.72	1087.73	954.01
MW-11	1 (top)	10/29/97	129.13	1139.30	1010.17
	2	10/29/97	181.92	1139.30	957.38
	3	10/29/97	195.91	1139.30	943.39
	4	10/29/97	200.74	1139.30	938.56
	5	10/29/97	263.21	1139.30	876.09
MW-12	1 (top)	10/29/97	N/W	1102.14	N/W
	2	10/29/97	157.14	1102.14	945.00
	3	10/29/97	159.64	1102.14	942.50
	4	10/29/97	171.33	1102.14	930.81
	5	10/29/97	229.60	1102.14	872.54
MW-13		10/29/97	227.97	1183.49	955.52
MW-14	1 (top)	10/29/97	200.36	1173.47	973.11
	2	10/29/97	200.56	1173.47	972.91
	3	10/29/97	200.06	1173.47	973.41
	4	10/29/97	200.01	1173.47	973.46
	5	10/29/97	200.40	1173.47	973.07
MW-15		10/29/97	36.25	1120.68	1084.43
MW-16		10/29/97	280.34	1236.29	955.95
MW-17	1 (top)	10/29/97	N/W	1191.21	N/W
	2	10/29/97	261.70	1191.21	929.51
	3	10/29/97	274.16	1191.21	917.05
	4	10/29/97	318.81	1191.21	872.40
	5	10/29/97	328.17	1191.21	863.04

TABLE 5-2
GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS
October 29, 1997

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-18	1 (top)	10/29/97	N/W	1225.41	N/W
	2	10/29/97	286.73	1225.41	938.68
	3	10/29/97	292.37	1225.41	933.04
	4	10/29/97	316.88	1225.41	908.53
	5	10/29/97	327.89	1225.41	897.52
MW-19	1 (top)	10/29/97	203.40	1142.94	939.54
	2	10/29/97	212.61	1142.94	930.33
	3	10/29/97	217.18	1142.94	925.76
	4	10/29/97	316.00	1142.94	826.94
	5	10/29/97	319.09	1142.94	823.85
MW-20	1 (top)	10/29/97	N/W	1165.05	N/W
	2	10/29/97	233.96	1165.05	931.09
	3	10/29/97	242.33	1165.05	922.72
	4	10/29/97	257.77	1165.05	907.28
	5	10/29/97	231.19	1165.05	933.86
MW-21	1 (top)	10/29/97	N/W	1059.10	N/W
	2	10/29/97	94.37	1059.10	964.73
	3	10/29/97	94.39	1059.10	964.71
	4	10/29/97	95.41	1059.10	963.69
	5	10/29/97	95.52	1059.10	963.58
MW-22	1 (top)	10/29/97	216.86	1176.98	960.12
	2	10/29/97	216.37	1176.98	960.61
	3	10/29/97	215.86	1176.98	961.12
	4	10/29/97	233.59	1176.98	943.39
	5	10/29/97	245.59	1176.98	931.39
MW-23	1 (top)	10/29/97	151.90	1108.84	956.94
	2	10/29/97	154.67	1108.84	954.17
	3	10/29/97	154.62	1108.84	954.22
	4	10/29/97	175.89	1108.84	932.95
	5	10/29/97	176.27	1108.84	932.57
MW-24	1 (top)	10/29/97	247.32	1200.94	953.62
	2	10/29/97	250.17	1200.94	950.77
	3	10/29/97	251.58	1200.94	949.36
	4	10/29/97	274.69	1200.94	926.25
	5	10/29/97	297.11	1200.94	903.83

FIGURES

Jet Propulsion Laboratory

MW-24
MW-7
MW-16
MW-1
MW-15
MW-11
MW-13
MW-9
MW-6
MW-8
MW-22
MW-12
MW-14
MW-3
MW-23
MW-18
MW-2
MW-4
MH-01
MW-10
MW-5
City of Pasadena Arroyo Well
MW-17
Lincoln Ave. Water Co. Well #3
City of Pasadena Well 52
City of Pasadena Ventura Well
Lincoln Ave. Water Co. Well #5
MW-21
City of Pasadena Windsor Well
MW-19
MW-20
Los Flores Water Co. Well #2
Rubio Canyon Land and Water Co.
#4
#7
La Canada Irrigation District
#6
#1
#3
#2
#4
#1
Valley Water Company
Oak Grove Ranger Station
Oak Grove Park
Devils Gate Reservoir
Spreading Grounds

GOULD AVE
HAMPTON RD
CROWN WY
VIRO RD
FOOTHILL BLVD
LINCOLN AVE
LOMA ALTA
MARIPOSA AVE
ALTADENA DR
CASITAS AVE
HARRIET
OLIVE DR
VENTURA ST
GLENROSE AVE
WINDSOR AVE
FIGUEROA ST
CROSBY ST

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well

N

Scale in Feet

0 1000 2000 ft.

Source: USGS, 7.5 Minute Topographic Map, Pasadena, CA. 1966, Revised 1988, 1994.

Figure 1-1

Locations of JPL Groundwater Monitoring Wells and Nearby Municipal Production Wells

Jet Propulsion Laboratory
Pasadena, California

Jet Propulsion Laboratory

MW-24
1: 5.0
2:
3:
4:
5:

MW-7
93

MW-11
1: --
2: 0.6
3:
4:
5:

MW-1
--

MW-16
NS

MW-22
1: --
2:
3:
4:
5:

MW-15
--

MW-13
8.2

MW-8
3.2

MW-9
--

MW-6
--

MW-12
1: NS
2:
3:
4:
5:

MW-3
1: --
2:
3:
4:
5:

MW-18
1: NS
2: --
3:
4:
5:

MW-14
1: --
2:
3:
4:
5:

MW-23
1: --
2:
3:
4:
5:

MW-2

MW-4
1: --
2:
3:
4:
5:

MH-01

MW-10
--

MW-5
--

City of Pasadena Arroyo Well

La Canada Irrigation District

#6

#1

#3
#2
#4
#1

Valley Water Company

Oak Grove Ranger Station

MW-21
1: NS
2:
3:
4:
5:

Oak Grove Park

Devils Gate Reservoir

Spreading Grounds

City of Pasadena Well 52

MW-17
1: --
2:
3:
4:
5:

Lincoln Ave. Water Co. Well #3

City of Pasadena Ventura Well

Lincoln Ave. Water Co. Well #5

City of Pasadena Windsor Well

MW-19
1: --
2:
3:
4:
5:

MW-20
1: NS
2:
3:
4:
5:

Rubio Canyon Land and Water Co.

#4

#7

Los Flores Water Co. Well #2

GOULD AVE
WY
AVE.
HAMPTON RD
CROWN
VIRO
BLVD
FOOTHILL AVE
LOMA ALTA
LINCOLN AVE
MARIPOSA AVE
ALTADENA DR
HARRIET
OLIVE DR
GLENROSE ST
VENTURA
WINDSOR AVE
FIGUEROA
CROSBY
AVE
ST

MCL
5.0
30
60
90

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- -- Not Detected
- Limit of Detection 0.5 µg/L
- 10 Concentration Contour (µg/L)
- MCL Maximum Contaminant Level (0.5 µg/L)

Note: Where constituents were detected in multiple screens, the higher concentration has been contoured.

Scale in Feet
0 1000 2000 ft.

Source: USGS, 7.5 Minute Topographic Map, Pasadena, CA. 1966, Revised 1988, 1994.

Figure 3-1

Contours of Carbon Tetrachloride Concentrations above MCLs in Aquifer Layer 1 September - October 1997

Jet Propulsion Laboratory
Pasadena, California

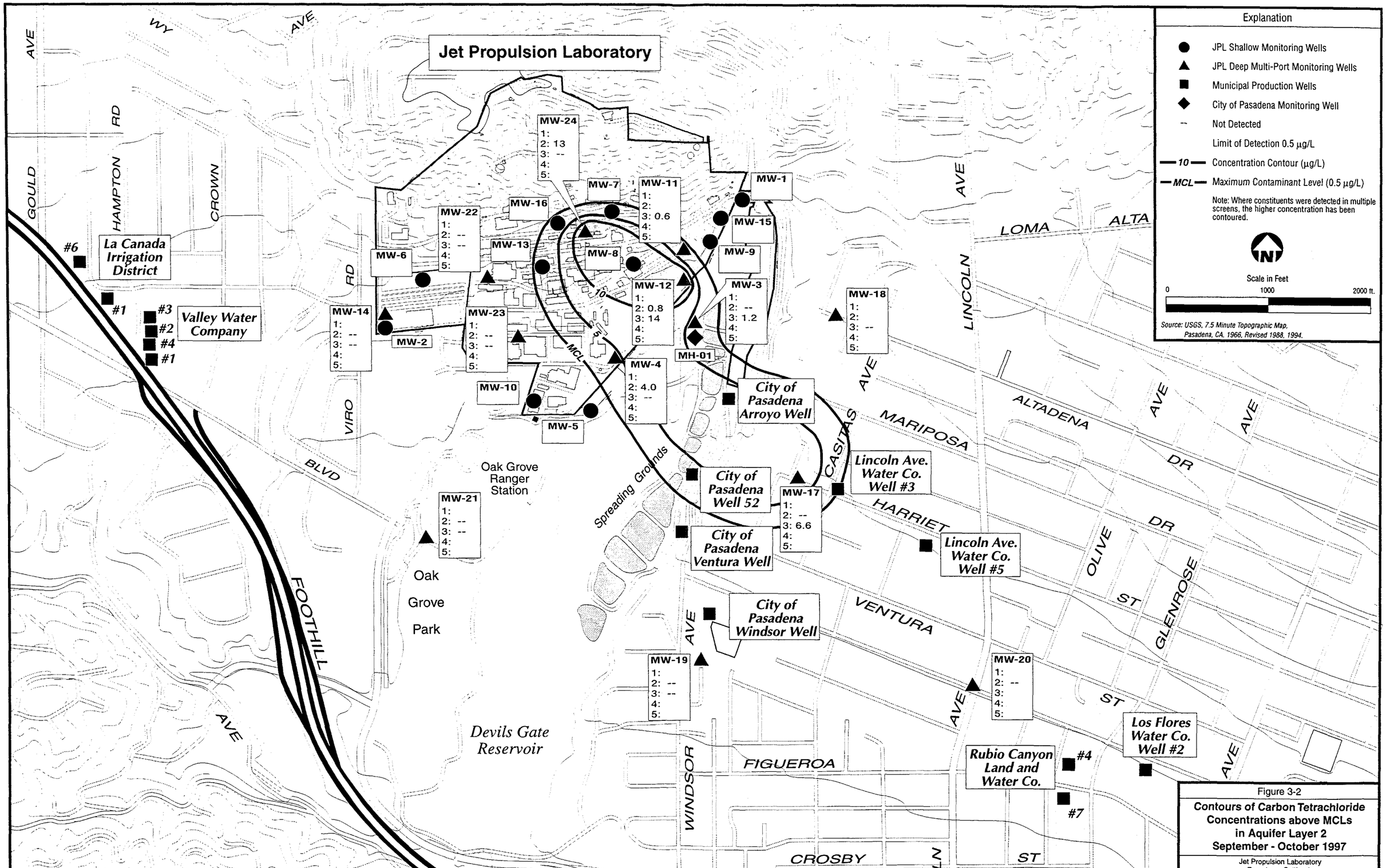


Figure 3-2

Contours of Carbon Tetrachloride Concentrations above MCLs in Aquifer Layer 2 September - October 1997

Jet Propulsion Laboratory
Pasadena, California

Jet Propulsion Laboratory

MW-24
1:
2:
3:
4: --
5: --

MW-7

MW-11
1:
2:
3:
4: --
5: --

MW-1

MW-16

MW-22
1:
2:
3:
4: --
5: --

MW-15

MW-13

MW-8

MW-9

MW-6

MW-12
1:
2:
3:
4: 3.8
5: 1.3

3.0

MW-3
1:
2:
3:
4: --
5: --

MCL

MW-18
1:
2:
3:
4: 2.4
5: --

MW-14
1:
2:
3:
4: --
5: --

MW-2

MW-23
1:
2:
3:
4: --
5: --

MH-01

MW-10

MW-4
1:
2:
3:
4: --
5: --

MW-5

City of Pasadena Arroyo Well

La Canada Irrigation District

#6

#1

#3
#2
#4
#1

Valley Water Company

GOULD AVE

HAMPTON RD

CROWN WY

VIRO RD

BLVD

FOOTHILL AVE

LINCOLN AVE

LOMA ALTA

ALTADENA DR

MARIPOSA AVE

CASITAS AVE

Spreading Grounds

Oak Grove Ranger Station

MW-21
1:
2:
3:
4: --
5: --

Oak Grove Park

Devils Gate Reservoir

City of Pasadena Well 52

MW-17
1:
2:
3:
4: --
5: --

Lincoln Ave. Water Co. Well #3

City of Pasadena Ventura Well

Lincoln Ave. Water Co. Well #5

HARRIET

OLIVE DR

GLENROSE ST

City of Pasadena Windsor Well

VENTURA

WINDSOR AVE

MW-19
1:
2:
3:
4: --
5: --

MW-20
1:
2:
3: --
4: --
5:

AVE

ST

Los Flores Water Co. Well #2

Rubio Canyon Land and Water Co.

#4

#7

FIGUEROA

CROSBY ST

LN

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- -- Not Detected
- Limit of Detection 0.5 µg/L
- 10 Concentration Contour (µg/L)
- MCL Maximum Contaminant Level (0.5 µg/L)

Note: Where constituents were detected in multiple screens, the higher concentration has been contoured.

N

Scale in Feet
0 1000 2000 ft.

Source: USGS, 7.5 Minute Topographic Map, Pasadena, CA. 1966, Revised 1988, 1994.

Figure 3-3

Contours of Carbon Tetrachloride Concentrations above MCLs in Aquifer Layer 3 September - October 1997

Jet Propulsion Laboratory
Pasadena, California

Jet Propulsion Laboratory

MW-24
1: 5.0
2:
3:
4:
5:

MW-7
22

MW-11
1: --
2: --
3:
4:
5:

MW-1
--

MW-16
NS

MW-22
1: --
2:
3:
4:
5:

MW-15
--

MW-13
19

MW-9
--

MW-6
--

MW-8
3.6

MW-12
1: NS
2:
3:
4:
5:

MW-3
1: --
2:
3:
4:
5:

MW-18
1: NS
2: --
3:
4:
5:

MW-14
1: --
2:
3:
4:
5:

MW-23
1: 3.1
2:
3:
4:
5:

MW-2

MH-01

MW-4
1: --
2:
3:
4:
5:

MW-10
4.3

MW-5
--

City of Pasadena Arroyo Well

La Canada Irrigation District

#6

#1

#3
#2
#4
#1

Valley Water Company

Oak Grove Ranger Station

MW-21
1: NS
2:
3:
4:
5:

Oak Grove Park

Devils Gate Reservoir

Spreading Grounds

City of Pasadena Well 52

City of Pasadena Ventura Well

City of Pasadena Windsor Well

MW-17
1: --
2:
3:
4:
5:

Lincoln Ave. Water Co. Well #3

Lincoln Ave. Water Co. Well #5

MW-19
1: --
2:
3:
4:
5:

MW-20
1: NS
2:
3:
4:
5:

Rubio Canyon Land and Water Co.

#4

#7

Los Flores Water Co. Well #2

GOULD AVE
WY AVE
HAMPTON RD
CROWN RD
VIRO RD
FOOTHILL BLVD
AVE
LINCOLN AVE
LOMA ALTA
ALTADENA DR
MARIPOSA AVE
CASITAS AVE
HARRIET
OLIVE DR
GLENROSE ST
VENTURA
WINDSOR AVE
FIGUEROA
CROSBY ST
ST

10
MCL

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- -- Not Detected
- Limit of Detection 0.5 µg/L
- 10 Concentration Contour (µg/L)
- MCL Maximum Contaminant Level (5.0 µg/L)

Note: Where constituents were detected in multiple screens, the higher concentration has been contoured.

N

Scale in Feet
0 1000 2000 ft.

Source: USGS, 7.5 Minute Topographic Map, Pasadena, CA. 1966, Revised 1988, 1994.

Figure 3-4

Contours of Trichloroethene Concentrations above MCLs in Aquifer Layer 1 September - October 1997

Jet Propulsion Laboratory
Pasadena, California

Jet Propulsion Laboratory

MW-24
1:
2: 1.3
3: --
4:
5:

MW-7

MW-11
1:
2:
3: --
4:
5:

MW-1

MW-16

MW-22
1:
2: --
3: --
4:
5:

MW-15

MW-13

MW-6

MW-8

MW-9

MW-12
1:
2: --
3: --
4:
5:

MW-3
1:
2: --
3: 0.5
4:
5:

MW-18
1:
2:
3: 3.0
4:
5:

MW-14
1:
2: 1.2
3: --
4:
5:

MW-2

MW-23
1:
2: --
3: --
4:
5:

MH-01

MW-4
1:
2: 8.0
3: --
4:
5:

City of Pasadena Arroyo Well

MW-10

MW-5

La Canada Irrigation District

#6

#1

#3
#2
#4
#1

Valley Water Company

10

20

MCL

Lincoln Ave. Water Co. Well #3

MW-17
1:
2: --
3: 22
4:
5:

City of Pasadena Well 52

Lincoln Ave. Water Co. Well #5

City of Pasadena Ventura Well

City of Pasadena Windsor Well

MW-21
1:
2: --
3: 0.6
4:
5:

MW-19
1:
2: --
3: --
4:
5:

MW-20
1:
2: --
3:
4:
5:

Rubio Canyon Land and Water Co.
#4
#7

Los Flores Water Co. Well #2

Oak Grove Ranger Station

Oak Grove Park

Devils Gate Reservoir

GOULD AVE
WY AVE
HAMPTON RD
CROWN RD
VIRO RD
BLVD
FOOTHILL AVE
LINCOLN AVE
LOMA ALTA
MARIPOSA AVE
ALTADENA DR
AVE
HARRIET ST
OLIVE DR
GLENROSE ST
VENTURA ST
WINDSOR AVE
FIGUEROA ST
CROSBY LN

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- -- Not Detected
- Limit of Detection 0.5 µg/L
- 10 Concentration Contour (µg/L)
- MCL Maximum Contaminant Level (5.0 µg/L)

Note: Where constituents were detected in multiple screens, the higher concentration has been contoured.

N

Scale in Feet
0 1000 2000 ft.

Source: USGS, 7.5 Minute Topographic Map, Pasadena, CA. 1966, Revised 1988, 1994.

Figure 3-5

Contours of Trichloroethene Concentrations above MCLs in Aquifer Layer 2 September - October 1997

Jet Propulsion Laboratory
Pasadena, California

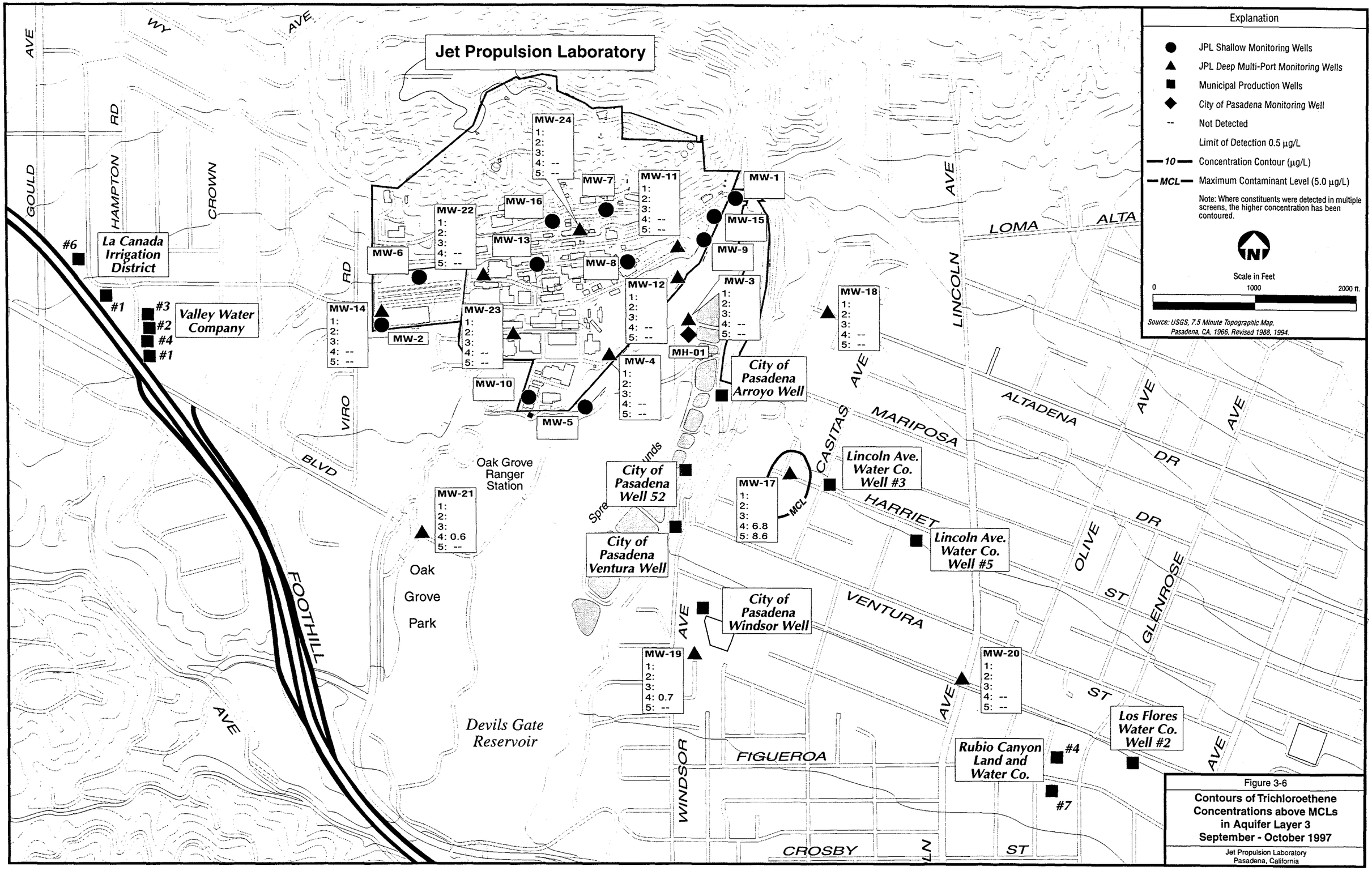


Figure 3-6

Contours of Trichloroethene Concentrations above MCLs in Aquifer Layer 3 September - October 1997

Jet Propulsion Laboratory
Pasadena, California

Jet Propulsion Laboratory

MW-24 1: -- 2: 3: 4: 5:
MW-7 0.9
MW-11 1: -- 2: -- 3: 4: 5:
MW-1 --
MW-16 NS
MW-22 1: -- 2: 3: 4: 5:
MW-15 --
MW-9 --
MW-6 --
MW-8 --
MW-13 1.1
MW-12 1: NS 2: 3: 4: 5:
MW-3 1: -- 2: 3: 4: 5:
MW-18 1: NS 2: -- 3: 4: 5:
MW-14 1: -- 2: 3: 4: 5:
MW-23 1: -- 2: 3: 4: 5:
MW-2
MH-01
MW-4 1: -- 2: 3: 4: 5:
MW-10 --
MW-5 --

MCL
1.0

#6 La Canada Irrigation District
#1
#3 #2 #4 #1 Valley Water Company
City of Pasadena Arroyo Well

Oak Grove Ranger Station
MW-21 1: NS 2: 3: 4: 5:
Oak Grove Park
Devils Gate Reservoir

City of Pasadena Well 52
City of Pasadena Ventura Well
MW-17 1: -- 2: 3: 4: 5:
Lincoln Ave. Water Co. Well #3
Lincoln Ave. Water Co. Well #5
City of Pasadena Windsor Well
MW-19 1: -- 2: 3: 4: 5:
MW-20 1: NS 2: 3: 4: 5:
Rubio Canyon Land and Water Co. #4 #7
Los Flores Water Co. Well #2

GOULD AVE
WY AVE
HAMPTON RD
CROWN RD
VIRO RD
FOOTHILL BLVD
LOMA ALTA DR
LINCOLN AVE
ALTADENA DR
MARIPOSA AVE
CASITAS AVE
HARRIET ST
OLIVE DR
GLENROSE ST
VENTURA ST
WINDSOR AVE
FIGUEROA ST
CROSBY ST
AVE

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- -- Not Detected
- Limit of Detection 0.5 µg/L
- 10 Concentration Contour (µg/L)
- MCL Maximum Contaminant Level (0.5 µg/L)

Note: Where constituents were detected in multiple screens, the higher concentration has been contoured.

N

Scale in Feet
0 1000 2000 ft.

Source: USGS, 7.5 Minute Topographic Map, Pasadena, CA. 1966, Revised 1988, 1994.

Figure 3-7

Contours of 1,2 - Dichloroethane Concentrations above MCLs in Aquifer Layer 1 September - October 1997

Jet Propulsion Laboratory
Pasadena, California

Jet Propulsion Laboratory

MW-24
1: --
2:
3:
4:
5:

MW-7
1.1

MW-11
1: --
2: --
3:
4:
5:

MW-1
--

MW-16
NS

MW-22
1: 2.0
2:
3:
4:
5:

MW-15
--

MW-13
--

MW-6
--

MW-9
--

MW-8
--

MW-12
1: NS
2:
3:
4:
5:

MW-3
1: --
2:
3:
4:
5:

MW-23
1: 0.6
2:
3:
4:
5:

MW-18
1: NS
2: --
3:
4:
5:

MW-14
1: --
2:
3:
4:
5:

MW-2

MH-01

MW-4
1: --
2:
3:
4:
5:

City of Pasadena Arroyo Well

MW-10
1.3

MW-5
--

0.5

0.5

La Canada Irrigation District
#6
#1

Valley Water Company
#3
#2
#4
#1

Oak Grove Ranger Station

MW-21
1: NS
2:
3:
4:
5:

Oak Grove Park

Devils Gate Reservoir

City of Pasadena Well 52

City of Pasadena Ventura Well

MW-17
1: --
2:
3:
4:
5:

Lincoln Ave. Water Co. Well #3

Lincoln Ave. Water Co. Well #5

City of Pasadena Windsor Well

MW-19
1: --
2:
3:
4:
5:

MW-20
1: NS
2:
3:
4:
5:

Rubio Canyon Land and Water Co.
#4
#7

Los Flores Water Co. Well #2

GOULD AVE
HAMPTON RD
CROWN WY
AVE
VIRO RD
BLVD
FOOTHILL AVE
LOMA ALTA
LINCOLN AVE
CASITAS AVE
MARIPOSA
ALTADENA DR
AVE
DR
HARRIET
OLIVE ST
GLENROSE ST
VENTURA
AVE
WINDSOR AVE
FIGUEROA
CROSBY ST
LN

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- -- Not Detected
- Limit of Detection 0.5 µg/L
- 10 Concentration Contour (µg/L)
- Maximum Contaminant Level (5 µg/L)

Note: Where constituents were detected in multiple screens, the higher concentration has been contoured.

Scale in Feet
0 1000 2000 ft.

Source: USGS, 7.5 Minute Topographic Map, Pasadena, CA. 1966, Revised 1988, 1994.

Figure 3-8

Contours of Tetrachloroethene Concentrations in Aquifer Layer 1 September - October 1997

Jet Propulsion Laboratory
Pasadena, California

Jet Propulsion Laboratory

MW-24
1:
2: --
3: --
4:
5:

MW-7

MW-11
1:
2:
3: --
4:
5:

MW-1

MW-16

MW-22
1:
2: --
3: --
4:
5:

MW-15

MW-13

MW-6

MW-8

MW-9

MW-12
1:
2: --
3: --
4:
5:

MW-3
1:
2: --
3: --
4:
5:

MW-18
1:
2:
3: 1.9
4:
5:

MW-23
1:
2: --
3: --
4:
5:

MW-14
1:
2: 1.9
3: --
4:
5:

MW-2

MH-01

MW-4
1:
2: 0.5
3: --
4:
5:

City of Pasadena Arroyo Well

MW-10

MW-5

La Canada Irrigation District

#6

#1

#3
#2
#4
#1

Valley Water Company

Oak Grove Ranger Station

City of Pasadena Well 52

MW-17
1:
2: --
3: 1.4
4:
5:

Lincoln Ave. Water Co. Well #3

City of Pasadena Ventura Well

Lincoln Ave. Water Co. Well #5

MW-21
1:
2: --
3: 1.3
4:
5:

Oak Grove Park

City of Pasadena Windsor Well

MW-19
1:
2: --
3: 1.5
4:
5:

MW-20
1:
2: --
3:
4:
5:

Devils Gate Reservoir

Rubio Canyon Land and Water Co.

#4

#7

Los Flores Water Co. Well #2

GOULD AVE
WY AVE
HAMPTON RD
CROWN
RD
VIRO
BLVD
FOOTHILL AVE
LINCOLN AVE
LOMA ALTA
CASITAS AVE
MARIPOSA
ALTADENA DR
OLIVE DR
GLENROSE AVE
HARRIET ST
VENTURA ST
WINDSOR AVE
FIGUEROA ST
CROSBY ST
AVE

0.5

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- -- Not Detected
- Limit of Detection 0.5 µg/L
- 10 Concentration Contour (µg/L)
- Maximum Contaminant Level (5 µg/L)

Note: Where constituents were detected in multiple screens, the higher concentration has been contoured.

Scale in Feet
0 1000 2000 ft.

Source: USGS, 7.5 Minute Topographic Map, Pasadena, CA, 1966, Revised 1988, 1994.

Figure 3-9

Contours of Tetrachloroethene Concentrations in Aquifer Layer 2 September - October 1997

Jet Propulsion Laboratory
Pasadena, California

Jet Propulsion Laboratory

MW-24 1: 2: 3: 4: -- 5: --
MW-7
MW-11 1: 2: 3: 4: -- 5: --
MW-1
MW-16
MW-22 1: 2: 3: 4: -- 5: --
MW-15
MW-13
MW-6
MW-8
MW-9
MW-12 1: 2: 3: 4: -- 5: --
MW-3 1: 2: 3: 4: -- 5: --
MW-23 1: 2: 3: 4: -- 5: --
MW-14 1: 2: 3: 4: -- 5: --
MW-2
MH-01
MW-4 1: 2: 3: 4: -- 5: --
MW-10
MW-5
MW-18 1: 2: 3: 4: 0.7 5: --

La Canada Irrigation District
#6
#1
Valley Water Company
#3
#2
#4
#1

City of Pasadena Arroyo Well

Oak Grove Ranger Station

City of Pasadena Well 52

MW-17 1: 2: 3: 4: 0.5 5: 0.6

Lincoln Ave. Water Co. Well #3

Lincoln Ave. Water Co. Well #5

MW-21 1: 2: 3: 4: 4.4 5: 2.9

City of Pasadena Ventura Well

City of Pasadena Windsor Well

MW-19 1: 2: 3: 4: 0.6 5: 2.2

MW-20 1: 2: 3: 4: -- 5: --

Rubio Canyon Land and Water Co.
#4
#7

Los Flores Water Co. Well #2

Oak Grove Park

Devils Gate Reservoir

GOULD AVE
WY AVE
HAMPTON RD
CROWN RD
VIRO RD
BLVD
FOOTHILL AVE
LINCOLN AVE
LOMA ALTA
CASITAS AVE
MARIPOSA AVE
ALTADENA DR
DR
HARRIET
OLIVE ST
GLENROSE ST
VENTURA ST
FIGUEROA
WINDSOR AVE
CROSBY ST

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- -- Not Detected
- Limit of Detection 0.5 µg/L
- 10 Concentration Contour (µg/L)
- Maximum Contaminant Level (5 µg/L)

Note: Where constituents were detected in multiple screens, the higher concentration has been contoured.

Scale in Feet
0 1000 2000 ft.

Source: USGS, 7.5 Minute Topographic Map, Pasadena, CA. 1966, Revised 1988, 1994.

Figure 3-10

Contours of Tetrachloroethene Concentrations in Aquifer Layer 3 September - October 1997

Jet Propulsion Laboratory
Pasadena, California

Jet Propulsion Laboratory

MW-24
1: 92
2:
3:
4:
5:

MW-7
550

MW-11
1: --
2: --
3:
4:
5:

MW-1
--

MW-15
--

MW-9
--

MW-22
1: --
2:
3:
4:
5:

MW-16
NS

MW-6
--

MW-8
29

MW-13
210

MW-12
1: NS
2:
3:
4:
5:

MW-3
1: --
2:
3:
4:
5:

MW-18
1: NS
2: --
3:
4:
5:

MW-14
1: --
2:
3:
4:
5:

MW-2

MW-23
1: 4.4
2:
3:
4:
5:

MW-4
1: 7.4
2:
3:
4:
5:

MH-01

MW-10
16

MW-5
--

MW-21
1: NS
2:
3:
4:
5:

MW-17
1: --
2:
3:
4:
5:

MW-19
1: --
2:
3:
4:
5:

MW-20
1: NS
2:
3:
4:
5:

#6 La Canada Irrigation District

#1

#3
#2
#4
#1 Valley Water Company

City of Pasadena Arroyo Well

City of Pasadena Well 52

City of Pasadena Ventura Well

City of Pasadena Windsor Well

Lincoln Ave. Water Co. Well #3

Lincoln Ave. Water Co. Well #5

Rubio Canyon Land and Water Co. #4

#7

Los Flores Water Co. Well #2

Oak Grove Ranger Station

Oak Grove Park

Devils Gate Reservoir

GOULD AVE
WY AVE
HAMPTON RD
CROWN
RD
VIRO
BLVD
FOOTHILL AVE
IAL
LINCOLN AVE
LOMA ALTA
MARIPOSA
ALTADENA DR
AVE
HARRIET
OLIVE DR
ST
GLENROSE AVE
VENTURA
FIGUEROA
WINDSOR AVE
CROSBY ST

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- -- Not Detected
- Limit of Detection 0.5 µg/L
- 10 Concentration Contour (µg/L)
- IAL Interim Action Level (18 µg/L)

Note: Where constituents were detected in multiple screens, the higher concentration has been contoured.

N

Scale in Feet
0 1000 2000 ft.

Source: USGS, 7.5 Minute Topographic Map, Pasadena, CA. 1966, Revised 1988, 1994.

Figure 3-11

Contours of Perchlorate Concentrations above IAL in Aquifer Layer 1 September - October 1997

Jet Propulsion Laboratory
Pasadena, California

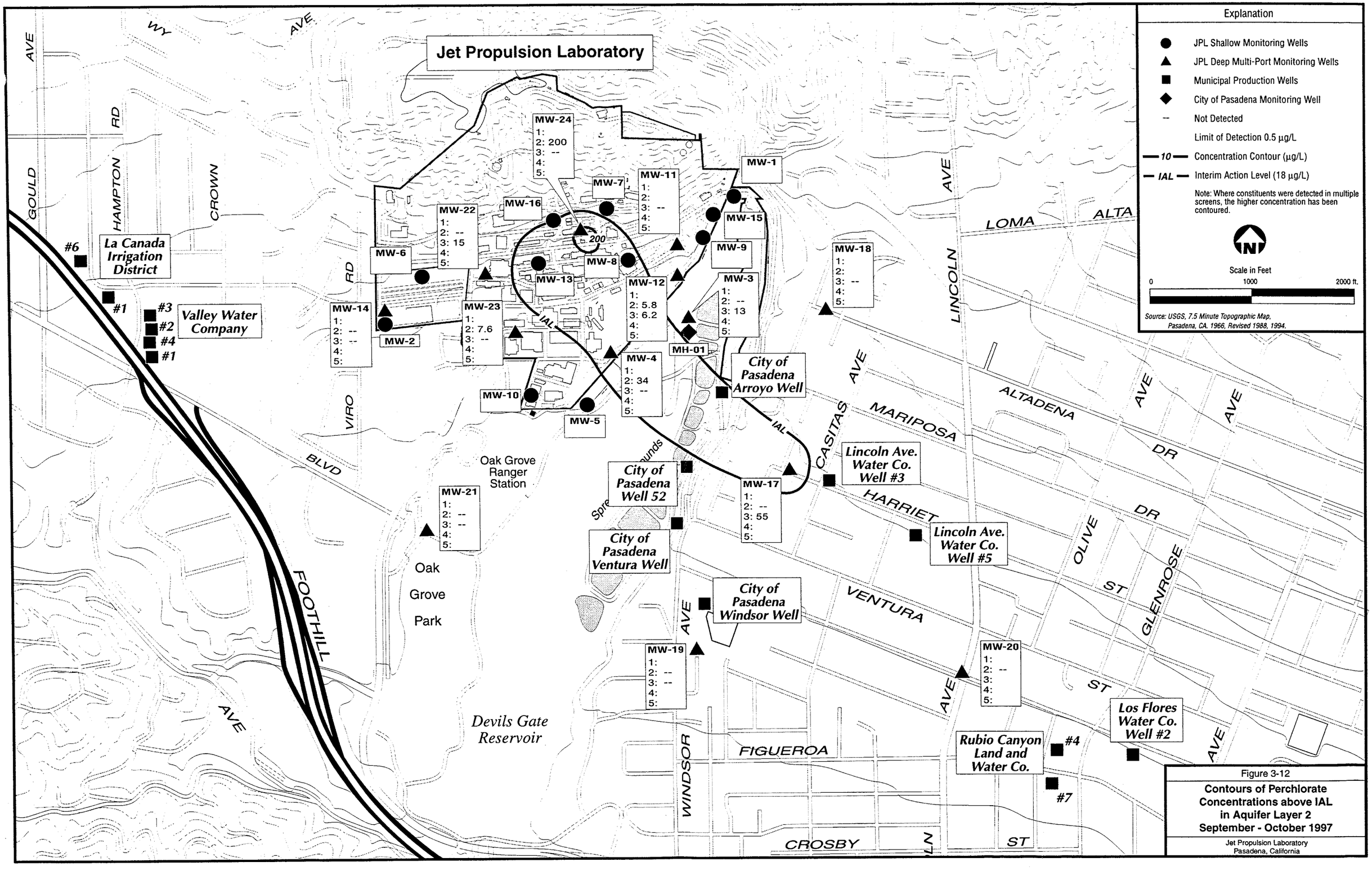
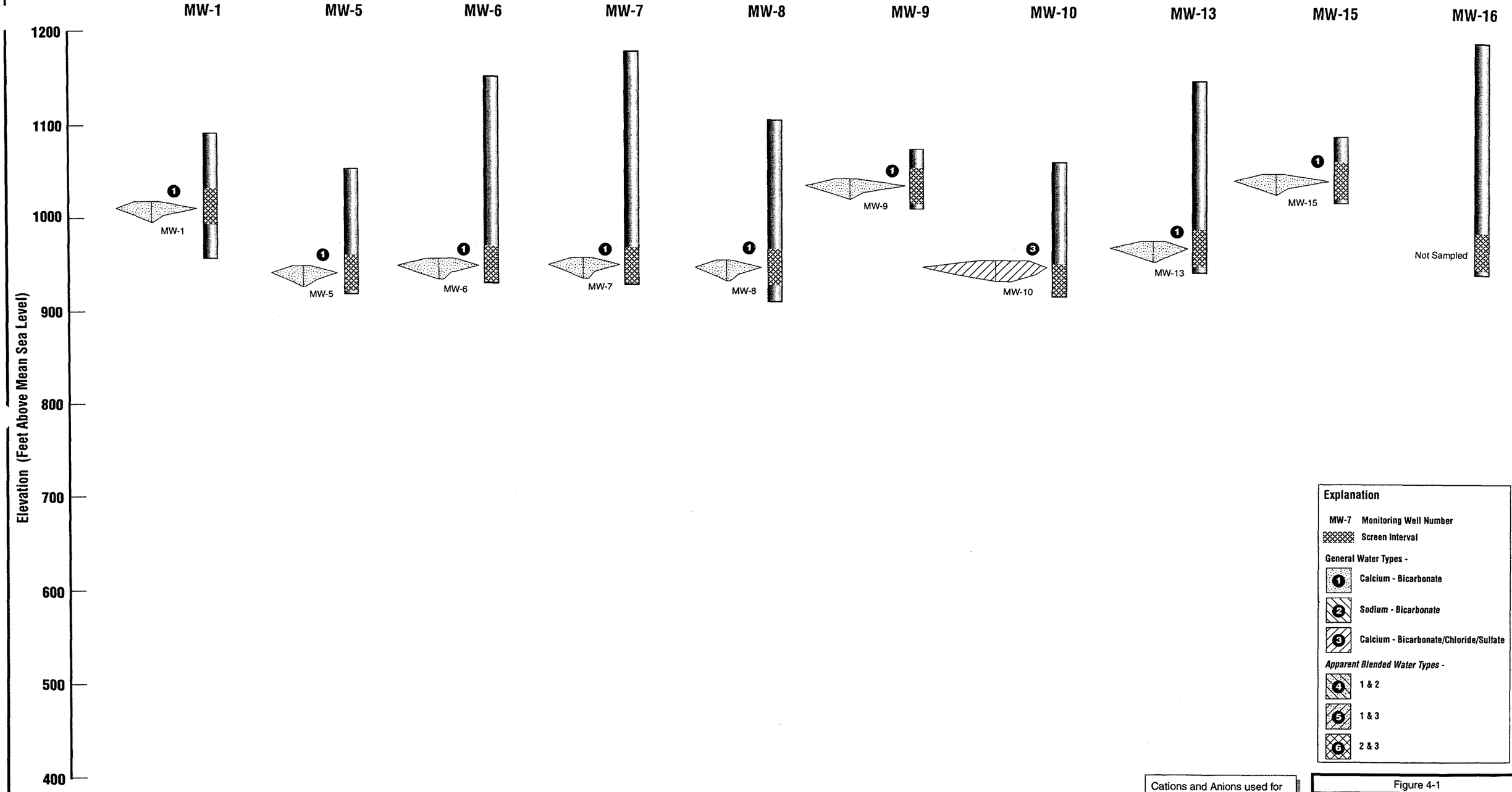


Figure 3-12

Contours of Perchlorate Concentrations above IAL in Aquifer Layer 2 September - October 1997

Jet Propulsion Laboratory
Pasadena, California



Explanation

- MW-7 Monitoring Well Number
- Screen Interval

General Water Types -

1. Calcium - Bicarbonate
2. *Sodium - Bicarbonate*
3. Calcium - Bicarbonate/Chloride/Sulfate

Apparent Blended Water Types -

4. 1 & 2
5. 1 & 3
6. 2 & 3

Cations and Anions used for Stiff Diagrams

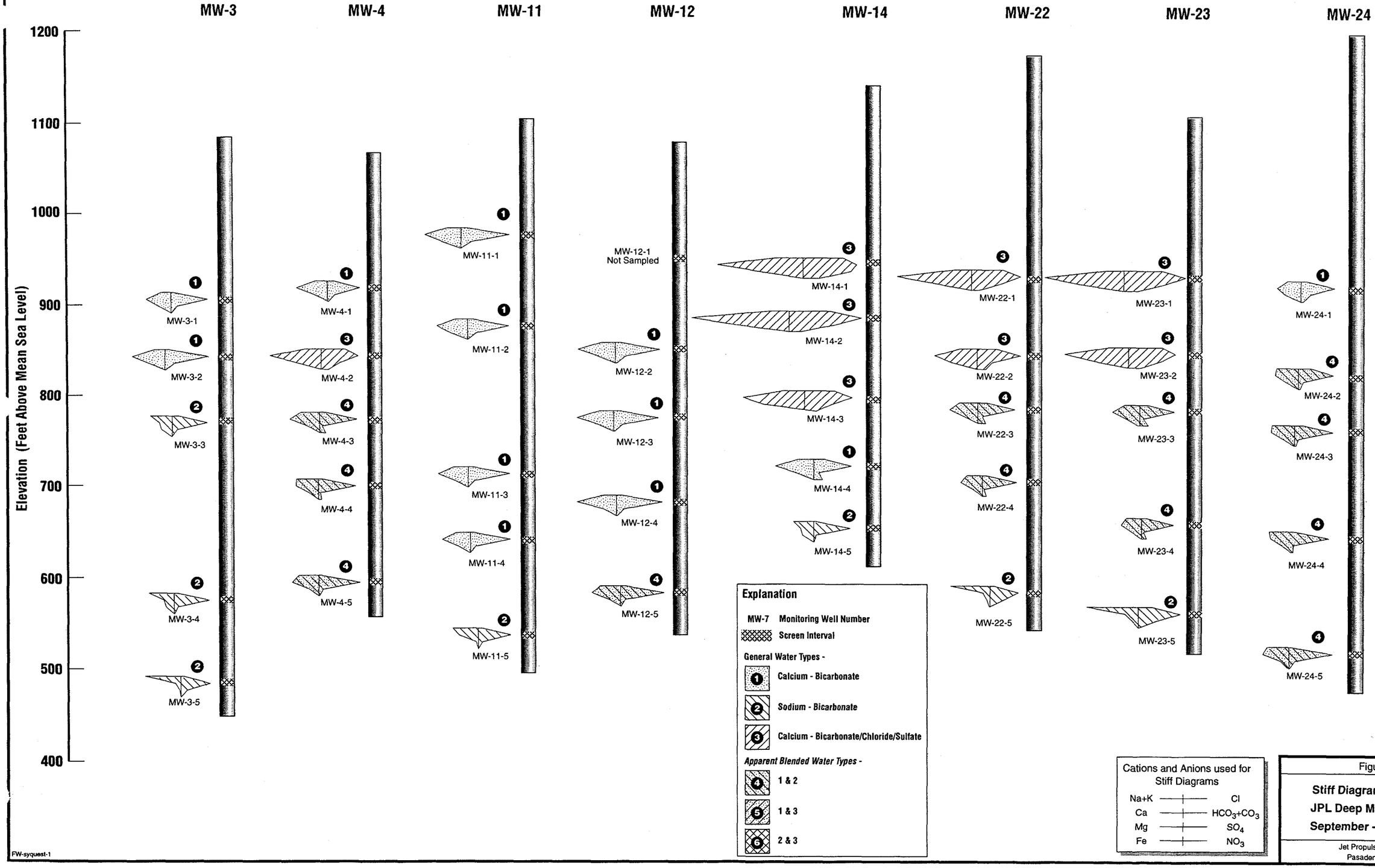
Na+K	Cl
Ca	HCO_3+CO_3
Mg	SO_4
Fe	NO_3

Figure 4-1

Stiff Diagrams for On-Site JPL Shallow Monitoring Wells September - October, 1997

Jet Propulsion Laboratory
Pasadena, California

FW-syquest-1

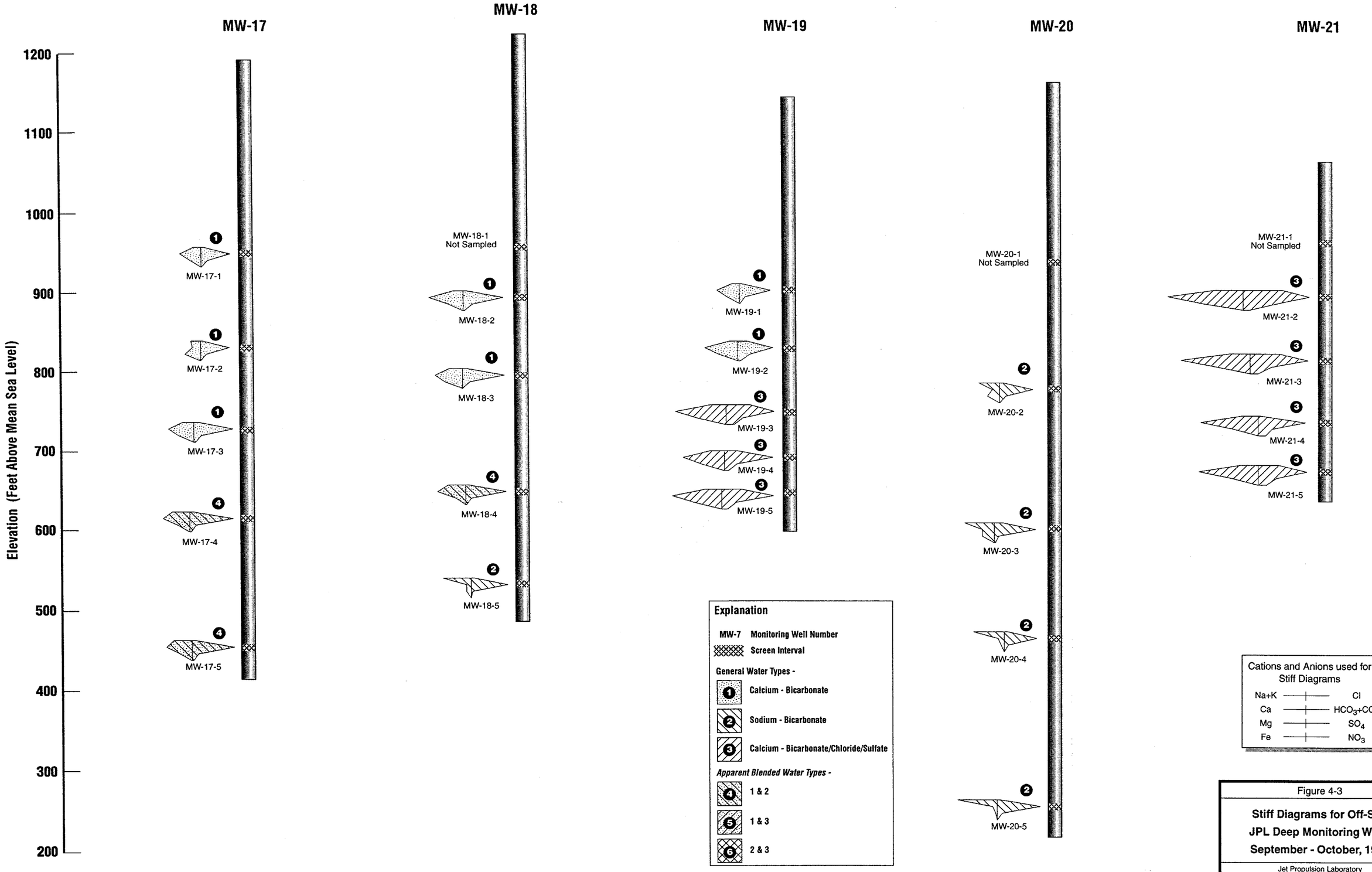


FW-syquest-1

Figure 4-2

Stiff Diagrams for On-Site JPL Deep Monitoring Wells September - October, 1997

Jet Propulsion Laboratory
Pasadena, California



FW-syquest-1

Figure 4-3

Stiff Diagrams for Off-Site JPL Deep Monitoring Wells September - October, 1997

Jet Propulsion Laboratory
Pasadena, California

Jet Propulsion Laboratory

MW-24 959.18
MW-7 957.14
MW-16 958.99
MW-1 1081.00
MW-15 1079.98
MW-11 1012.67
MW-13 959.52
MW-6 968.74
MW-8 958.28
MW-9 1078.13
MW-14 971.19
MW-22 962.31
MW-12 ND
MW-3 950.69
MW-18 ND
MW-23 960.08
MW-4 953.79
MW-2
MH-01
MW-10 957.58
MW-5 955.62
MW-17 949.54
MW-21 965.06*
MW-19 944.33
MW-20 932.30*

1080 1060 1040 1020 1000 980 960 955 945 970 965 960 955 950 945 950 950 945 940 935 930

La Canada Irrigation District
#6
#1
Valley Water Company
#3
#2
#4
#1
City of Pasadena Arroyo Well
City of Pasadena Well 52
City of Pasadena Ventura Well
City of Pasadena Windsor Well
Lincoln Ave. Water Co. Well #3
Lincoln Ave. Water Co. Well #5
Los Flores Water Co. Well #2
Rubio Canyon Land and Water Co.
#4
#7

Oak Grove Ranger Station
Spreading Grounds
Oak Grove Park
Devils Gate Reservoir

GOULD AVE
HAMPTON RD
CROWN WY
VIRO RD
FOOTHILL BLVD
LINCOLN AVE
LOMA ALTA
MARIPOSA AVE
ALTADENA DR
OLIVE DR
GLENROSE ST
CASITAS AVE
HARRIET ST
VENTURA ST
WINDSOR AVE
FIGUEROA ST
CROSBY LN

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- ND — No Data; Top screen dry. Second screen significantly affected by nearby pumping
- * — Top screen dry. Water elevation from second screen used, based on historical similarities with top screens
- Direction of groundwater flow

Note: Contours Represent Feet Above Mean Sea Level

N

Scale in Feet
0 1000 2000 ft.

Source: USGS, 7.5 Minute Topographic Map, Pasadena, CA. 1966, Revised 1988, 1994.

Figure 5-1

Water-Table Elevation Contour Map
September 9, 1997

Jet Propulsion Laboratory
Pasadena, California

Jet Propulsion Laboratory

MW-24 953.62
MW-7 951.44
MW-1 1085.91
MW-16 955.95
MW-15 1084.43
MW-11 1010.17
MW-13 955.52
MW-6 969.87
MW-8 952.34
MW-9 1082.12
MW-14 973.11
MW-22 960.12
MW-12 ND
MW-3 944.14
MW-18 ND
MW-23 956.94
MW-2
MW-4 950.18
MH-01
MW-10 954.01
MW-5 950.49
MW-17 ND
MW-21 964.73*
MW-19 939.54
MW-20 931.09*

1080 1060 1040 1020 1000 980 960 955 950

975 970 965 960 955 950 940 940 945 945 940 935 930

La Canada Irrigation District
#6
#1
Valley Water Company
#3
#2
#4
#1

City of Pasadena Arroyo Well
City of Pasadena Well 52
City of Pasadena Ventura Well
City of Pasadena Windsor Well
Lincoln Ave. Water Co. Well #3
Lincoln Ave. Water Co. Well #5
Rubio Canyon Land and Water Co.
#4
#7
Los Flores Water Co. Well #2

Oak Grove Ranger Station
Oak Grove Park
Devils Gate Reservoir
Spreading Grounds

GOULD AVE
WY
HAMPTON RD
CROWN AVE
VIRO RD
BLVD
FOOTHILL
LOMA ALTA
LINCOLN AVE
MARIPOSA
ALTADENA DR
AVE
CASITAS
HARRIET
OLIVE DR
ST
GLENROSE AVE
VENTURA
WINDSOR AVE
FIGUEROA
CROSBY ST

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- ND — No Data; Top screen dry. Second screen significantly affected by nearby pumping
- * — Top screen dry. Water elevation from second screen used, based on historical similarities with top screens
- Direction of groundwater flow

Note: Contours Represent Feet Above Mean Sea Level

N

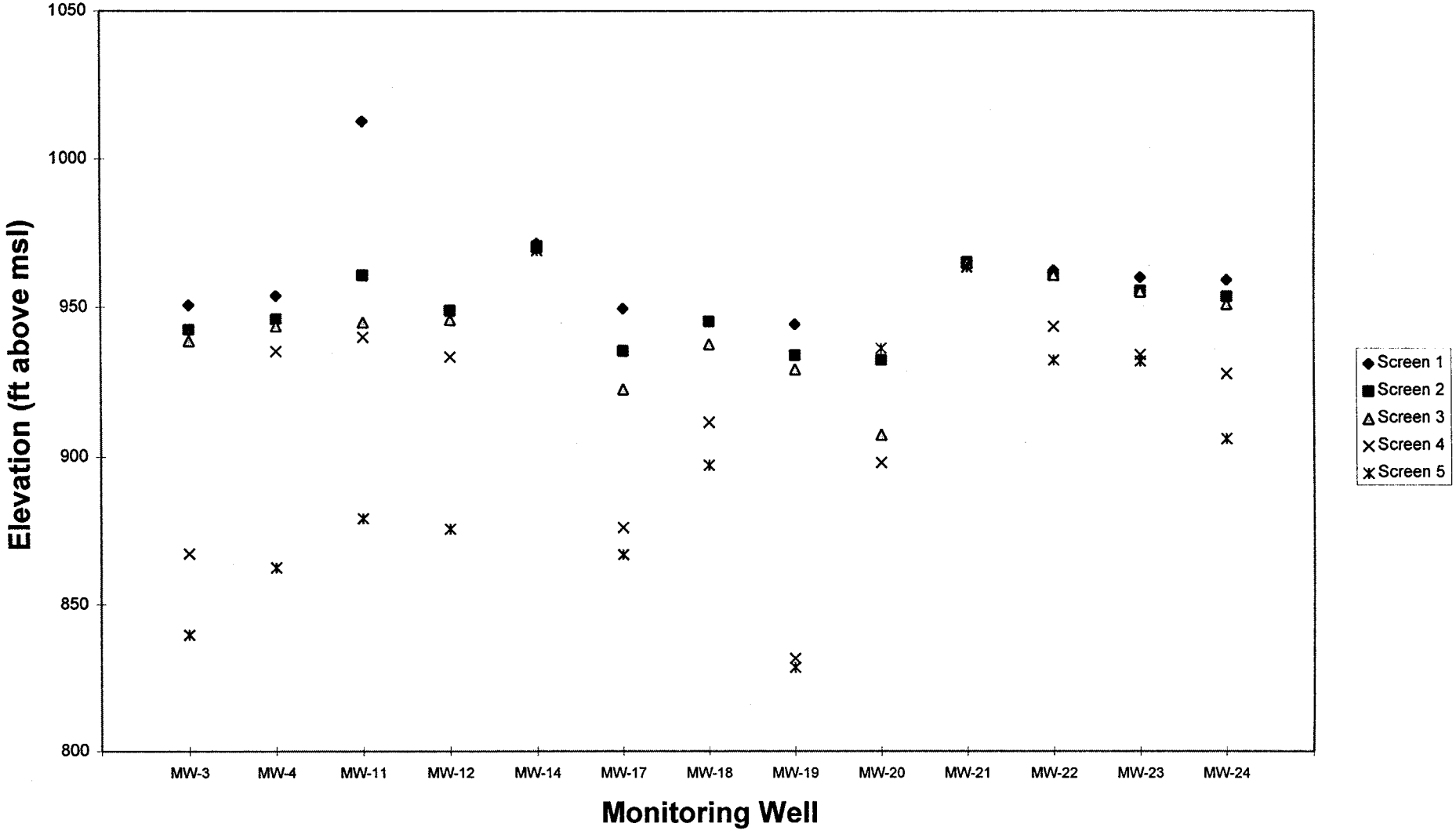
Scale in Feet
0 1000 2000 ft.

Source: USGS, 7.5 Minute Topographic Map, Pasadena, CA. 1966, Revised 1988, 1994.

Figure 5-2

Water-Table Elevation Contour Map
October 29, 1997

Jet Propulsion Laboratory
Pasadena, California



Note: Water levels were below screen 1 for MW-12, MW-18, MW-20, and 21.

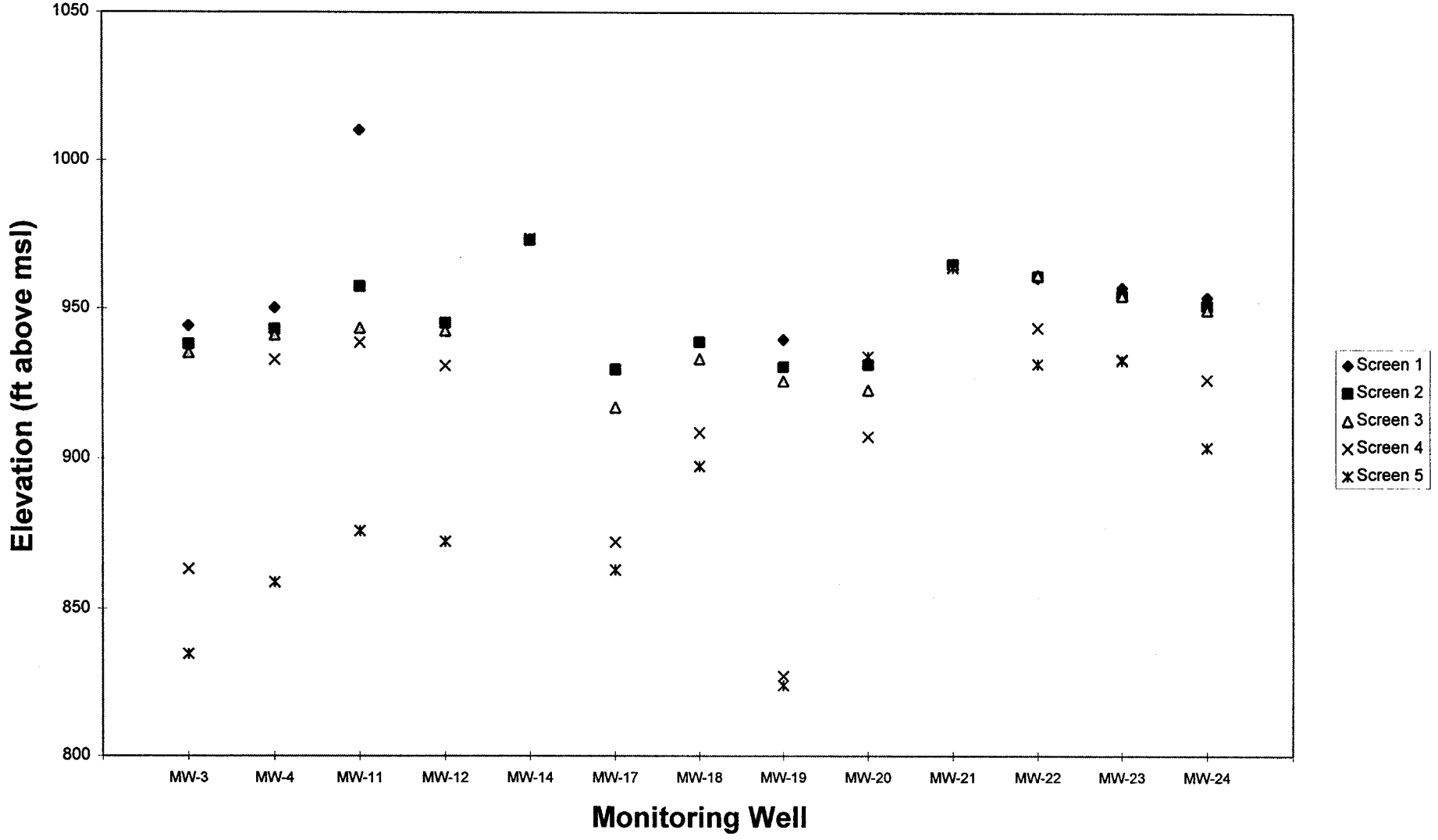
Figure 5-3

PIEZOMETRIC WATER LEVELS

FROM DEEP (MP) WELLS

September 9, 1997

Jet Propulsion Laboratory
Pasadena, California



Note: Water levels were below screen 1 for MW-12, MW-17, MW-18, MW-20, and 21.

Figure 5-4

PIEZOMETRIC WATER LEVELS

FROM DEEP (MP) WELLS

October 29, 1997

Jet Propulsion Laboratory
Pasadena, California

APPENDIX A

WELL DEVELOPMENT/WELL SAMPLING LOG FORMS FOR SHALLOW WELLS

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572
Date : 10/28/97
Site Engineer : T. BLANEY, J. BRENNER
Well Number : MW-1
Equipment : YSI 3500
DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	30.71	TOP OF 4" CASING	30.71
Depth to Sediment (ft)	119.25	TOP OF 4" CASING	119.25
Thickness of Sediment (ft)			

Depth of Well (ft)
Diameter of Casing (ft) 0.333
Water Column Height (ft) 88.54
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 57.6
Casing Volumes Purged
Total Volume Purged (gals)

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1120	8.04	8.39	20.3	448	2.6	PUMP ON AT 240 Hz
1125	7.84	14.73	18.8	456	2.6	WATER SL. CLOUDY
1130	7.48	11.57	17.4	448	2.6	WATER SL. CLOUDY
1135	7.35	7.34	17.1	439	2.6	WATER CLEARING
1140	7.18	3.74	17.0	432	2.6	WATER CLEAR
1145	7.17	1.38	17.1	433	2.6	WATER CLEAR
1150	7.26	0.75	17.2	432	2.6	WATER CLEAR
1153	7.18	0.65	18.0	434	2.6	WATER CLEAR
1156	7.18	0.73	17.3	444	2.6	
1200	—	—	—	—	0.02	ROCKS FLOW
1205	—	—	—	—	0.02	COLLECT MW-9B-01
1215					0.02	SHUT DOWN PUMP

Notes Sampling Procedures: PUMP SET AT 38' BTOC

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572
Date : 10/27/97
Site Engineer : T. BLANEY / J. BRENNER
Well Number : MW-5
Equipment : YSI 3500
DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	121.02	TOP OF 4" CASING	121.02
Depth to Sediment (ft)	133.60	TOP OF 4" CASING	133.60
Thickness of Sediment (ft)			

Depth of Well (ft)
Diameter of Casing (ft) 0.333
Water Column Height (ft) 12.58
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 8.2
Casing Volumes Purged
Total Volume Purged (gals)

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0800	7.77	933	15.7	389	2.8	START Pump @ 299 Hz.
0805	6.82	304	16.4	387	2.8	WATER SL. CLOUDY
0810	6.72	5.85	16.6	388	2.8	WATER CLEAR
0815	6.65	2.11	16.6	384	2.8	Water V. Clear
0820	6.64	1.00	16.5	381	2.8	Water Extremely clear
0823	6.61	0.95	16.5	382	2.8	Water " "
0826	6.62	1.00	16.6	382	2.8	Water " "
0829					0.02	Reduce Flow For Sampling
0830					0.02	Sample MW-973-13
0834					0.02	SHUT OFF Pump

Notes Sampling Procedures: Set Pump @ 124' Bgs.

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0227
Date : 10-22-97
Site Engineer : T. BLANEY / T. CHOI

Well Number : MW-06
Equipment : YSI 3500
HF SCIENTIFIC DRT-15C
Contractor :

	Before	Reference Point	After
Depth to Water (ft)	219.03		
Depth to Sediment (ft)	~~236.22~~ 244.25		
Thickness of Sediment (ft)			

Depth of Well (ft) ____
Diameter of Casing (ft) ____
Water Column Height (ft) ____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = ____
Casing Volumes Purged ____
Total Volume Purged (gals) ____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1541						START PUMP @ MW-6 ; CONTROL BOX @ 360 Hz
1545	8.34	72.9	21.9	583	1.7	WATER V. CLOUDY
1550	6.93	63.5	22.5	591	1.7	WATER V. CLOUDY

Notes Sampling Procedures: SET PUMP @ ≈ 323' bgs

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0227
Date : 10-22-97
Site Engineer : T. BLANEY / T. CHOI

Well Number : MW-6
Equipment : YSI 3500
HF SCIENTIFIC DRT-15C
Contractor : ____

	Before	Reference Point	After
Depth to Water (ft)	219.03	BTOC	
Depth to Sediment (ft)	244.25	BTOC	
Thickness of Sediment (ft)	0.75		

Depth of Well (ft) 245.00
Diameter of Casing (ft) 0.33
Water Column Height (ft) 25.22
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 16.46
Casing Volumes Purged ____
Total Volume Purged (gals) ____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1541	—	—	—	—	—	START PUMP @ MW-6, SET CONTROL
						BOX @ 360 Hz
1545	8.34	72.9	21.9	583	1.7	WATER V. CLOUDY
1550	6.93	63.5	22.5	591	1.7	WATER V. CLOUDY
1555	6.91	45.0	23.2	579	1.7	WATER V. CLOUDY
1600	6.84	19.6	22.7	572	1.7	WATER SLIGHTLY CLOUDY
1605	6.85	15.9	22.3	579	1.7	WATER SL. CLOUDY
1610	6.85	7.00	22.4	574	1.7	WATER CLEAR
1615	6.93	2.56	22.4	576	1.7	WATER READY TO SAMPLE
1618	6.81	2.24	22.4	579	1.7	READY TO SAMPLE
1621	6.88	1.78	22.0	572	1.7	READY TO SAMPLE
1624	—	—	—	—	0.02	TURN DOWN FLOW TO 320 Hz
1625	—	—	—	—	0.02	SAMPLE MW-9T3-14
1629	—	—	—	—	—	SHUT DOWN PUMP

Notes Sampling Procedures: PUMP SET @ ≈ 323' bgs

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572 0227
Date : 10/29/97
Site Engineer : T. BLANEY

Well Number : MW-7
Equipment : DRT-15C
YSI 3500
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	261.56		
Depth to Sediment (ft)	272.88		
Thickness of Sediment (ft)			

Depth of Well (ft)
Diameter of Casing (ft) 0.333
Water Column Height (ft) 11.32
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 7.38
Casing Volumes Purged
Total Volume Purged (gals)

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0755					1.44	START Pump @ MW-7
						Control Box @ 395 Hz.
0800	7.82	35.6	20.9	492	1.44	Water sl. cloudy
0805	7.73	4.80	20.8	464	1.44	Water V. clear
0810	7.51	3.03	21.4	455	1.44	Water V. clear
0815	7.34	2.14	21.5	459	1.44	Water V. clear
0820	7.34	1.26	21.3	457	1.44	Water V. clear
0825	7.34	0.90	21.2	457	1.44	Water Ex. clear
0830	7.35	0.85	21.3	456	1.44	Water Ex. clear
0833	7.34	0.78	21.2	458	1.44	Water Ex. clear
0836	7.34	0.77	21.2	457	1.44	Water Ex. clear
0839					0.02	Reduce Flow For Sampling
0840					0.02	Sample MW-973-15
0852						SHUT DOWN Pump AFTER
						Collecting Water FOR
						PERCHLORATE STUDY.
						Collected 9 gals of water

Notes Sampling Procedures: Set Pump @ 264' BTOC

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572
Date : 10/22/97.
Site Engineer : J. CHOI / T. BLANEY

Well Number : MW-8
Equipment : YSI 3500
DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	187.01	TOP OF 4" CASING	
Depth to Sediment (ft)	202.50	TOP OF 4" CASING	
Thickness of Sediment (ft)	2.5		

Depth of Well (ft) 205
Diameter of Casing (ft) 0.333
Water Column Height (ft) 15.49
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 10.1
Casing Volumes Purged
Total Volume Purged (gals)

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1403					1.9	START Pump @ MW-8. Set Control Box @ 350 Hz
1410	6.95	>200	19.1	402	1.9	Water v. Cloudy
1415	6.93	>200	19.9	393	1.9	Water v. cloudy
1420	6.86	49.2	19.6	397	1.9	water sl. cloudy
1425	6.80	17.5	19.6	396	1.9	water sl. clear
1430	6.78	8.6	19.7	395	1.9	Water Clear
1435	6.78	7.5	19.7	397	1.9	water clear
1440	6.76	5.8	19.7	396	1.9	water clear
1445	6.77	5.4	19.7	396	1.9	Water clear
1450	6.80	4.1	19.6	399	1.9	Water v. clear
1453	6.84	4.2	19.5	395	1.9	Water v. clear
1456	6.81	4.2	19.5	395	1.9	Water v. Clear
1459					0.02	TURN DOWN FLOW (307 Hz)
1500					0.02	SAMPLE MW-973-16
1503						SHUT DOWN PUMP.

Notes Sampling Procedures:
Set Pump @ 190' BGS.

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572
Date : 10/28/97
Site Engineer : T. BLAKEY, J. BORNER

Well Number : MW-9
Equipment : YSI 3500
DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	24.07	TOP OF 4" CASING	24.07
Depth to Sediment (ft)	69.77	TOP OF 4" CASING	69.77
Thickness of Sediment (ft)			

Depth of Well (ft)
Diameter of Casing (ft) 0.333
Water Column Height (ft) ~~0.333~~ 45.7
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 29.7
Casing Volumes Purged
Total Volume Purged (gals)

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1005	7.16	23.6	20.0	537	3.0	PUMP ON AT 240 Hz
1010	7.29	4.50	18.6	515	3.0	WATER CLEAR
1015	7.01	3.60	19.3	513	3.0	" "
1020	6.80	2.42	18.9	515	3.0	" "
1025	6.81	2.09	18.6	513	3.0	" "
1030	6.~~80~~	1.15	19.8	514	3.0	READY TO SAMPLE
1035	6.84	1.03	19.7	513	0.02	FLOW REDUCED
1040	—	—	—	—	0.02	MW-973-17 COLLECTED
1041	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET AT 28' BTOC

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572
Date : 10/27/97
Site Engineer : T. BLANEY / J BRANNER
Well Number : MW-10
Equipment : YSI 3500
PRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	134.63	TOP OF 4" CASING	134.63
Depth to Sediment (ft)	154.05	TOP OF 4" CASING	154.05
Thickness of Sediment (ft)			

Depth of Well (ft)
Diameter of Casing (ft) 0.333
Water Column Height (ft) 19.42
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 12.7
Casing Volumes Purged
Total Volume Purged (gals)

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1000	6.95	117.5	20.1	913	2.4	START PUMP @ 350 Hz
1005	6.71	31.5	20.3	953	2.4	WATER SL. CLOUDY
1010	6.80	14.70	19.9	944	2.4	WATER CLEARING
1015	6.70	11.63	20.2	950	2.4	WATER CLEARING
1020	6.72	8.62	20.1	961	2.4	WATER CLEAR
1025	6.70	6.13	20.3	969	2.4	WATER CLEAR
1030	6.72	6.75	19.7	959	2.4	WATER CLEAR
1035	6.69	4.91	19.8	963	2.4	WATER CLEAR
1040	6.65	4.05	20.2	961	2.4	WATER CLEAR
1043	6.69	3.60	20.2	956	2.4	WATER CLEAR
1046	6.67	3.23	19.9	953	2.4	READY TO SAMPLE
1049					0.02	REDUCED FLOW FOR SAMPLING
1050	—	—	—	—	0.02	MW-973-18 COLLECTED
1100	—	—	—	—	0.02	MW-973-19 COLLECTED (DUPLICATE)
1101						PUMP OFF

Notes Sampling Procedures: SET PUMP AT 138' BGS

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : IRL
Project Number : 572
Date : 9/25/97
Site Engineer : T BLAWEY

Well Number : MW-13
Equipment : YSI 3500
HFS DRT 15C
Contractor : ____

	Before	Reference Point	After
Depth to Water (ft)	226.78		
Depth to Sediment (ft)	234.90		
Thickness of Sediment (ft)			

Depth of Well (ft) 235
Diameter of Casing (ft) 0.333
Water Column Height (ft) 8.22
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 5.37
Casing Volumes Purged 10.1
Total Volume Purged (gals) 54.48

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0835						START PUMP, SET CONTROL BOX @ 75 HZ
0840	6.43	89.5	21.0	537	2.27 GPM	WATER CLOUDY
0845	7.01	13.81	21.7	531	2.27	WATER CLEARING
0849	6.98	10.42	21.8	525	2.27	WATER SL CLOUD
0853	7.02	4.11	21.7	530	2.27	WATER CLEAR
0856	7.08	2.83	21.8	530	2.27	WATER CLEAR
0859	7.12	2.36	21.7	530	2.27	WATER CLEAR
0900					0.02	Reduce Flow RATE
0900					0.02	Sample MW-973-31 (MW-13)
0910					0.02	Sample MW-973-32 (Dup MW-13)
0918						SHUT DOWN PUMP

Notes Sampling Procedures: ____

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572
Date : 10/27/97
Site Engineer : T. BLANEY, J. BRENNER
Well Number : MW-15
Equipment : YSI 3500
PIT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	36.27	TOP OF 4" CASING	
Depth to Sediment (ft)	74.98	TOP OF 4" CASING	
Thickness of Sediment (ft)			

Depth of Well (ft)
Diameter of Casing (ft) 0.333
Water Column Height (ft) 38.71
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 25.2
Casing Volumes Purged
Total Volume Purged (gals)

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1245					3.0	Start Pump; Control Box Set @ 270 Hz
1250	7.22	4.00	17.8	505	3.0	Water V. clear
1255	7.00	3.33	18.0	488	3.0	Water V. clear
1300	6.96	2.30	18.2	484	3.0	Water V. clear
1305	6.97	1.99	17.9	486	3.0	Water V. clear
1310	6.98	1.94	17.8	484	3.0	Water V. clear
1313	6.97	0.92	17.9	484	3.0	Water V. clear
1316	6.98	0.94	17.8	483	3.0	Water V. clear
1319	—	—	—	—	0.02	Reduce Flow for Sampling
1320	—	—	—	—	0.02	Sample MW-973-38
1324	—	—	—	—	0.02	Shut Down Pump

Notes Sampling Procedures: Set Pump @ 39' bgs

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APPENDIX B

WELL DEVELOPMENT/WELL SAMPLING LOG FORMS, PIEZOMETRIC PRESSURE PROFILE RECORDS, AND GROUNDWATER SAMPLING FIELD DATA SHEETS FOR DEEP MULTI-PORT WELLS

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0218
Date : 9-12-97
Site Engineer : T.CHOI / M.LOSY

Well Number : MW-3
Equipment : YSI 3500
HF SCIENTIFIC DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESSURE PROFILES FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft)
Diameter of Casing (ft)
Water Column Height (ft)
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) =
Casing Volumes Purged
Total Volume Purged (gals)

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1025	8.00	0.96	21.6	345	—	1ST RUN @ SCREEN 5; INITIAL PARAMETERS
1055	—	—	—	—	—	2ND RUN: SAMPLE MW-973-06
1125	8.46	1.34	21.9	335	—	3RD RUN; FINAL PARAMETERS
1155	8.38	2.45	21.7	328	—	1ST RUN @ SCREEN 4: INITIAL PARAMETERS
1225	—	—	—	—	—	2ND RUN: SAMPLE MW-973-05
1248	8.42	2.50	21.5	333	—	3RD RUN: FINAL PARAMETERS
1310	8.46	6.52	21.6	348	—	1ST RUN @ SCREEN 3: INITIAL PARAMETERS
1330	8.66	4.97	21.9	350	—	2ND RUN SAMPLE MW-973-04
1350	—	—	—	—	—	3RD RUN SAMPLE MW-973-04
1415	8.70	4.79	22.4	355	—	4TH RUN: FINAL PARAMETERS

Notes Sampling Procedures:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0218
Date : 9-15-97
Site Engineer : T.CHU1/M.LOS1

Well Number : MW-3
Equipment : HE SCIENTIFIC DRT-15C
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*SEE PRESSURE PROFILES FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0842	7.22	2.11	19.5	435	—	1ST RUN @ SCREEN 2 : INITIAL PARAMETERS
0904	—	—	—	—	—	2ND RUN: SAMPLE MW-973-03
0920	7.44	1.59	20.3	435	—	3RD RUN: FINAL PARAMETERS
0945	7.62	2.12	20.0	341	—	1ST RUN @ SCREEN1 : INITIAL PARAMETERS
1000	—	—	—	—	—	2ND RUN: SAMPLE MW-973-02
1015	7.61	~~20.4~~ 15.33	20.4	350	—	3RD RUN: FINAL PARAMETERS

Notes Sampling Procedures: _____

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572 0227
Date : 9/24/97
Site Engineer : T. BLANEY
Well Number : MW-4
Equipment : DRT-15C
YSI 3500
Contractor :

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESSURE PROFILES FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft)
Diameter of Casing (ft)
Water Column Height (ft)
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) =
Casing Volumes Purged
Total Volume Purged (gals)

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0848	7.12	8.5	19.8	366	—	1ST Run Screen # 1; Reducing Turbidity
0900	7.23	6.8	20.5	376	—	2ND Run Reducing TURBIDITY
0915	7.23	4.76	20.7	380	—	3RD Run; Ready to Sample
0935						SAMPLE MW-973-07
0955	7.32	5.1	20.3	372	—	FINAL Parameters
1015	7.15	3.51	20.6	696	—	1ST Run Screen #2; Ready to Sample
1035					—	SAMPLE MW-973-08
1045					—	SAMPLE MW-973-09 (Dupe of 973-08)
1120	7.20	15.04	21.1	684	—	FINAL Parameters
1140	7.84	1.42	21.7	412	—	1ST Run Screen #3; Ready to Sample
1200					—	SAMPLE MW-973-10
1217	8.02	1.29	22.0	422	—	FINAL Parameters
1242	8.02	3.28	22.6	372	—	1ST Run Screen #4, READY TO SAMPLE
1310					—	SAMPLE MW-973-11
1320	8.09	4.32	22.1	370	—	FINAL PARAMETERS
1345	7.94	3.92	22.3	373	—	1ST RUN SCREEN 5, Ready to Sample
1405					—	SAMPLE MW-973-12
1433	7.97	4.43	23.3	392	—	FINAL Parameters

Notes Sampling Procedures:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0227
Date : 10-1-97
Site Engineer : T.BLANEY/J.BRENNER/T.CHOI
Well Number : MW-11
Equipment : YSI 3500
HF SCIENTIFIC DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*SEE PRESSURE PROFILES FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1110	7.92	2.55	22.3	319	—	1ST RUN: INITIAL PARAMETERS: SCREEN 5
1145	—	—	—	—	—	2ND RUN: SAMPLE MW-973-24
1205	8.19	3.44	23.1	319	—	3RD RUN: FINAL PARAMETERS-SC
1225	8.11	4.95	21.4	360	—	1ST RUN: INITIAL PARAMETERS-SCREEN 4
1305	—	—	—	—	—	2ND RUN: SAMPLE MW-973-23
1320	8.16	4.84	22.8	376	—	3RD RUN: FINAL PARAMETERS
1355	8.16	3.02	20.9	386	—	1ST RUN: INITIAL PARAMETERS: SCREEN 3
1420	—	—	—	—	—	2ND RUN: SAMPLE MW-973-22
1435	8.06	0.56	22.4	401	—	3RD RUN: FINAL PARAMETERS
1450	7.97	3.00	20.9	415	—	1ST RUN@SCREEN 2: INITIAL PARAMETERS
1520	—	—	—	—	—	2ND RUN: SAMPLE MW-973-21 MS/MSD
1520	—	—	—	—	—	SAMPLE MW-973-21
1530	7.92	2.73	20.4	415	—	3RD RUN: FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0227
Date : 10-2-97
Site Engineer : T.CHOI

Well Number : MW-11
Equipment : YSI 3500
HF SCIENTIFIC DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESSURE PROFILE FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0822	7.48	4.64	19.2	450	—	1ST RUN: INITIAL PARAMETERS Screen #1
0850	—	—	—	—	—	2ND RUN: SAMPLE MW-973-20
0900	7.39	4.71	19.1	450	—	FINAL Parameters Screen #1.

Notes Sampling Procedures: _____

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0227
Date : 10-2-97
Site Engineer : T. BLANEY, T. CHU, J. BRENNER, M. LOST

Well Number : MW-12
Equipment : YSI 3500
HF SCIENTIFIC DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESSURE PROFILES FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0950	7.68	0.99	20.5	394	—	1ST RUN : INITIAL PARAMETERS Screen #5
1020	—	—	—	—	—	2nd RUN: SAMPLE MW-973-30
1040	—	—	—	—	—	3rd RUN: SAMPLE MW-973-30
1100	7.90	1.51	21.8	410	—	4th RUN: FINAL PARAMETERS; Screen #5
1125	7.87	1.50	20.1	430	—	1ST RUN: INITIAL PARAMETERS Screen #4
1200					—	2nd RUN: Sample MW-973-29
1215	7.93	2.60	20.2	435	—	Final Parameters Screen #4
1235	7.92	5.5	19.9	436	—	1ST Run Screen #3; Reduce TURBIDITY
1255	7.91	8.2	20.6	438	—	2ND Run Screen #3; Reducing TURBIDITY
1317	7.90	4.18	20.4	446	—	3RD Run Screen #3; Ready to Sample
1325						Sample MW-973-28
1345	7.88	4.90	20.0	443	—	Final Parameters Screen #3
1410	7.55	3.37	20.4	455	—	1ST Run Screen #2; Ready to Sample
1430					—	Sample MW-973-27
1444	7.46	4.97	19.9	452	—	Final Parameters @ Screen #2

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0227
Date : 9/25/97
Site Engineer : T.CHOI/M.LOSI/J.BRENNER

Well Number : MW-14
Equipment : YSI 3500
HFS DT 15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESSURE PROFILES FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1100	7.99	3.8	21.2	310	—	1ST RUN@SCREEN 5; INITIAL PARAMETERS
1130	—	—	—	—	—	2ND RUN: SAMPLE MW-973-37
1150	8.66	4.60	20.9	303	—	3RD RUN: FINAL PARAMETERS
1210	7.33	3.89	21.2	1141	—	1ST RUN@SCREEN 1: INITIAL PARAMETERS
1235	—	—	—	—	—	2ND RUN: SAMPLE MW-973-33
1300	6.86	2.57	21.9	1167	—	3RD RUN: FINAL PARAMETERS
1325	7.17	9.6	21.2	1221	—	1ST RUN@SCREEN 2: INITIAL PARAMETERS
1345	7.19	12.15	20.6	1214	—	2ND RUN: ATTEMPTING TO REDUCE TURBIDITY
1400	7.22	10.94	20.8	1226	—	3RD RUN: " " "
1430	7.27	10.80	20.7	1221	—	4TH RUN: " " "
1450	7.27	3.82	20.9	1232	—	5TH RUN: ATTEMPTING TO REDUCE TURBIDITY
1510	—	—	—	—	—	6TH RUN: SAMPLE MW-973-34
1520	7.08	4.11	20.7	1222	—	7TH RUN: FINAL PARAMETERS
1550	7.77	2.94	20.6	865	—	1ST Run Screen #3. Ready to Sample
1605	[illegible]	[illegible]	[illegible]	[illegible]	—	Sample MW-973-35
1630	7.60	2.19	20.7	8466		Final Parameters Screen #3

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572 0227
Date : 9/29/97
Site Engineer : T. BLANEY

Well Number : MW-14
Equipment : DRT-15CE
4523500
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	* See Pressure Profiles FOR WATER LEVELS		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0757	7.37	1.73	20.1	492	—	1ST Run Screen #4; Ready to Sample
0830						Sample MW-973-36
0900	7.84	4.14	20.8	491	—	Final Parameters Screen #4

Notes Sampling Procedures: _____

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0218
Date : 9-15-97
Site Engineer : T. CHOI / M. LOSTI

Well Number : MW-17
Equipment : YSI 3500
HF SCIENTIFIC DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*SEE PRESSURE PROFILES FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1152	8.13	75.0	20.4	413	—	1ST RUN@ SCREEN 5; INITIAL PARAMETERS
1226	8.06	60.1	21.9	422	—	2ND RUN@SCREEN 5; ATTEMPT TO REDUCE TURBITY. WILL RETURN LATER
1300	7.90	3.57	21.3	417	—	1ST RUN@SCREEN 4; INITIAL PARAMETERS
1330	—	—	—	—	—	3RD RUN: SAMPLE MW-973-43
1357	7.91	5.60	20.7	414	—	3RD RUN: FINAL PARAMETER

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0218
Date : 9-16-97
Site Engineer : TCHOI / M. LOSI

Well Number : MW-17
Equipment : YSI 3500
HF SCIENTIFIC DRT-15C
Contractor :

	Before	Reference Point	After
Depth to Water (ft)	*SEE PRESSURE PROFILES FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0905	8.74	1.23	18.4	248	—	1ST RUN @ SCREEN 2: INITIAL PARAMETERS
0940	—	—	—	—	—	2ND RUN: SAMPLE MW-973-41
						SAMPLE: MW-973-41 MS/MSD
1005	—	—	—	—	—	3RD RUN: SAMPLE MW-973-41
1030	9.12	14.12	18.5	243	—	4TH RUN: FINAL PARAMETERS
1058	7.89	1.30	19.4	293	—	1ST RUN @ SCREEN 1: INITIAL PARAMETERS
1120	—	—	—	—	—	2ND RUN: SAMPLE MW-973-40
1141	7.38	3.47	20.6	301	—	3RD RUN: FINAL PARAMETERS
1250	7.91	31.2	27.3	478	—	1ST RUN @ SCREEN 5: INITIAL PARAMETERS
						WILL RETURN TO THIS SCREEN LATER
1325	7.80	2.54	20.8	395	—	1ST RUN @ SCREEN 3: INITIAL PARAMETERS
1350	—	—	—	—	—	2ND RUN: SAMPLE MW-973-42
1416	7.83	1.64	21.1	379	—	3RD RUN: FINAL PARAMETERS

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0218
Date : 9-17-97
Site Engineer : TCHOI/MLOBL

Well Number : MW-17
Equipment : YSI 3500
HF SCIENTIFIC DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*SEE PRESSURE PROFILES FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0900	7.39	22.7	19.8	390	—	1st RUN @ SCREEN 5: INITIAL PARAMETERS
0935	7.40	53.7	19.8	393	—	2nd RUN: ATTEMPTING TO REDUCE TURBIDITY
						*BAILED 11 gallons FROM WELL
						TO ACCOMODATE PURGE WATER
						FROM SCREEN 5

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572-0218
Date : 9/18/97
Site Engineer : KEHOE/MOSLEY

Well Number : MW-17
Equipment : YSI 3500
HFS DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*SEE PRESSURE PROFILES FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0854	7.42	4.83	19.7	388	—	1ST RUN @ SCREEN3: INITIAL PARAMETERS
0930	—	—	—	—	—	2ND RUN: SAMPLE MW-17-3.44
0952	7.44	5.17	19.8	381	—	3RD RUN: FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572 0227
Date : 9/23/97
Site Engineer : T. Bravery

Well Number : MW-17
Equipment : DRT-15CE
YSI 3500
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	* See Pressure Profile sheets for water levels		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0832	7.95	1.3	17.7	375	—	1st Run @ MW-17
						Screen #3 For Resample
0850	7.94	2.6	17.9	388	—	2nd Run; Sample MW-973-00.
						Cr^{+6} + Final Parameters

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0227
Date : 9/23/97
Site Engineer : T BLANEY
Well Number : MW-19
Equipment : DRT 15CE
YSI 3560
Contractor :

	Before	Reference Point	After
Depth to Water (ft)	*SEE PRESSURE PROFILES FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft)
Diameter of Casing (ft)
Water Column Height (ft)
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) =
Casing Volumes Purged
Total Volume Purged (gals)

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0947	8.85	1.65	20.8	287	–	1ST RUN SCREEN 5, READY TO SAMPLE
1000	—	—	—	—	–	SAMPLE MW-973-49
1045	9.09	0.89	22.2	306	–	FINAL PARAMETERS, SCREEN 5
1115	8.33	1.12	20.6	365	–	1ST RUN SCREEN 4, INITIAL PARAM
1145	—	—	—	—	–	2ND RUN, SAMPLE MW-973-48
1200	8.36	2.33	21.7	380	–	3RD RUN FINAL PARAMETERS
1230	8.24	2.05	19.8	395	–	1ST Run Screen #3; Ready to Sample
1255					–	Sample MW-973-47
1313	8.24	1.49	21.2	407	–	Final Parameters; Screen #3
1338	7.72	1.43	22.3	418	–	1ST Run Screen # 2; Ready to Sample
1400					–	Sample MW-973-46
1415	7.65	2.86	21.1	403	–	Final Parameters, Screen #2

Notes Sampling Procedures:

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0218
Date : 9-18-97
Site Engineer : T.CHOY/M.LOSL/G.SHOW

Well Number : MW-19
Equipment : YSI 3500
HF SCIENTIFIC DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*SEE PRESSURE PROFILES FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1042	~~7.03~~ 7.35	41.98	21.1	709	—	1ST RUN @ SCREEN 5 PRIOR SAMPLING
1110	—	—	—	—	—	2ND RUN: SAMPLE MW-973-54
1135	7.55	6.30	20.8	710	—	3RD RUN: FINAL PARAMETERS
1155	7.65	9.41	20.2	580	—	1ST RUN @ SCREEN 4 INITIAL PARAMETERS
1222	7.64	9.82	20.4	587	—	2ND RUN: ATTEMPTING TO REDUCE TURBIDITY
1245	—	—	—	—	—	3RD RUN: SAMPLE: MW-973-54
1315	7.64	6.87	20.4	585	—	4TH RUN: FINAL PARAMETERS
1340	7.24	18.0	23.2	793	—	1ST RUN @ SCREEN 3: INITIAL PARAMETERS
1405	7.24	16.04	21.2	756	—	2ND RUN: ATTEMPTING TO REDUCE TURBIDITY
1430	7.24	11.8	21.5	759	—	3RD RUN: WILL RETURN LATER

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0218
Date : 9-19-97
Site Engineer : T.CHOI/M.LOSI

Well Number : MW-19
Equipment : YSI 3500
HF SCIENTIFIC DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESSURE PROFILE DATA FOR WATER LEVELS		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0855	7.38	4.63	19.5	304	—	1ST RUN @ SCREEN 1: INITIAL PARAMETERS
0915	—	—	—	—	—	2ND RUN: SAMPLE MW-973-50
0937	7.20	4.78	18.7	297	—	3RD RUN: FINAL PARAMETERS
1000	7.46	40.10	22.3	476	—	1ST @ SCREEN 2: INITIAL PARAMETERS
1020	6.99	12.20	19.7	457	—	2ND RUN: ATTEMPTING TO REDUCE TURB.
1040	7.00	21.60	19.8	458	—	3RD RUN: ATTEMPTING TO REDUCE TURBIDITY
1100	6.99	16.24	20.5	466	—	4TH RUN: ATTEMPTING TO REDUCE TURBIDITY
1122	7.03	8.23	21.3	469	—	5TH RUN: ATTEMPTING TO REDUCE TURBIDITY
1150	7.01	6.83	21.3	470	—	6TH RUN: ATTEMPTING TO REDUCE TURBIDITY
1250	6.98	7.32	21.3	239	—	7TH RUN: ATTEMPTING TO REDUCE TURBIDITY
1313	7.07		21.5	468	—	8TH RUN:
1420	7.17	2.02	21.4	747	—	1ST RUN @ SCREEN 3: INITIAL PARAMETERS
1480	—	—	—	—	—	2ND RUN: SAMPLE MW-973-52
						SAMPLE MW-973-52 MS/MSD
1520	7.40	1.70	22.1	679	—	3RD RUN: FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1872.0227
Date : 9-22-97
Site Engineer : T. CHOI / M. LOSI

Well Number : MW-19
Equipment : YSI 3500
HF SCIENTIFIC DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESSURE PROFILES FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0839	7.29	4.57	18.5	437	—	1ST RUN @ SCREEN: INITIAL PARAMS RINSE BOTTLES W/FORMATION WATER
0900	—	—	—	—	—	2ND RUN: SAMPLE MW-973-51
0920	—	—	—	—	—	3RD RUN: SAMPLE MW-973-51
0940	7.13	5.98	19.2	497	—	4TH RUN: FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.
Date : 9/22
Site Engineer : TBLANEY

Well Number : MW-20
Equipment : YSI 3500
HF SCIENTIFIC DRT 15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESSURE PROFILES FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1035	8.90	3.50	19.8	353	—	1ST RUN @ SCREEN 5; INITIAL PARAMETERS
1110	—	—	—	—	—	2ND RUN: SAMPLE MW-973-57
1143	9.08	0.99	19.2	350	—	3RD RUN: FINAL PARAMETERS, SAMPLE MW-973-57
1213	8.70	1.35	19.4	302	—	1ST RUN @ SCREEN 4, INITIAL PARAMETERS
1245	—	—	—	—	—	2ND RUN: SAMPLE MW-973-58
1340	8.57	1.40	19.5	302	—	3RD RUN FINAL PARAMETERS SAMPLE MW-973-58
1409	8.39	4.56	19.1	396	—	1ST RUN @ SCREEN 3; INITIAL PARAMETERS
1430	—	—	—	—	—	2ND RUN: SAMPLE MW-973-57
1455	8.37	2.46	19.3	404	—	3RD RUN: SAMPLE MW-973-57; FINAL PARAMETERS
1515	8.86	3.57	18.7	295	—	1ST RUN @ SCREEN 2; INITIAL PARAMETERS
—	—	—	—	—	—	2ND RUN: SAMPLE MW-973-56
1555	9.01	4.36	19.5	303		FINAL RUN

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572 0227
Date : 9/29/97
Site Engineer : T. BLANEY

Well Number : MW-21
Equipment : DRT-15CE
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*SEE PRESSURE PROFILE DATA FOR WATER LEVELS		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0955	7.64	23.1	20.9	735	—	1ST Run Screen #4 Reducing Turbidity
1022	7.73	17.01	20.6	728	—	2nd RUN: ATTEMPTING TO REDUCE TURBIDITY
1050	7.77	17.3	22.3	762	—	3rd RUN: " " "
1125	7.77	50.7	21.3	742	—	4th RUN: " " "
						— WILL RETURN LATER —
1145	7.55	19.32	21.3	705	—	1ST RUN @ SCREEN 4 INITIAL PARAMETERS
1210	7.37	4.51	21.8	721	—	2nd Run @ Screen #4: Ready to Sample
1215	—	—	—	—	—	Sample MW-973-63
1240	7.27	3.54	21.9	719	—	Final Parameters @ Screen #4
1300	7.40	10.02	21.1	884	—	1ST RUN @ SCREEN 3: INITIAL PARAMETERS
1315	7.43	10.46	20.9	888	—	2nd RUN: ATTEMPTING TO REDUCE TURBIDITY
1330	7.54	6.87	20.8	890	—	3rd RUN: " " "
1348	7.36	18.20	22.0	915	—	4th RUN " " "
1405	7.46	8.69	22.4	927	—	5th RUN: " " "
						WILL RETURN LATER
1425	7.48	0.75	20.9	1102	—	1ST RUN @ SCREEN 2 INITIALS
~~1450~~ 1445	—	—	—	—	—	2nd RUN: SAMPLE MW-973-61
~~1455~~ 1450	—	~~0.51~~	—	—	—	~~3rd~~ SAMPLE MW-973-61 MS/MSD
1500	7.36	0.51	24.6	1091	—	3rd RUN: FINAL PARAMETERS

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0227
Date : 9-30-97
Site Engineer : T. BLANEY/T. CHOI/M. LOSI

Well Number : MW-21
Equipment : YSI 3500
HF SCIENTIFIC DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*SEE PRESSURE PROFILES FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1115	7.43	23.9	21.5	743		1ST Run Screen #5; Reducing Turbidity
1346	7.55	12.19	21.6	719		2ND Run; After Purge; Ready to Sample.
1400	~~7.57~~		~~21.5~~	~~760~~		Sample MW-973-64 (MW-21 Screen #5).
1425	7.51	14.6	21.5	760		Final Parameters Screen #5

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 15720227
Date : 10/1/97
Site Engineer : T. Blaney

Well Number : MW-21
Equipment : DRT-15CE
YSI 3500
Contractor :

	Before	Reference Point	After
Depth to Water (ft)	* See Pressure Probes for water levels		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0945	6.95	3.16	19.7	879		1ST Pump Screen #3. Ready to Sample
1000						Sample MW-973-62
1020	7.28	2.96	20.1	882		Final Parameters Screen #3.

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 15720227
Date : 10/9/97
Site Engineer : T. BLANEY

Well Number : MW-22
Equipment : DRT-15C
YSI 3500
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	* See Pressure Profiles For water levels		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0835	8.51	24.2	19.9	371	—	1ST Pump Screen #5; Reducing Turbidity
0858	8.56	10.34	19.8	370	—	2ND Pump Screen #5; Reducing Turbidity
0925	8.50	4.41	20.1	370	—	3RD Pump Screen #5; Ready to Sample
0945					—	Sample MW-973-69
1010	8.48	20.1	20.2	369	—	Final Parameters @ Screen #5
1035	7.80	2.79	20.0	328	—	1ST Pump Screen #4; Ready to Sample
1055					—	Sample MW-973-62
1120	7.55	2.80	20.8	331	—	Final Parameters Screen #4

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0227
Date : 10-13-97
Site Engineer : J.BRENNER/T.CHOI/T.BLANEY

Well Number : MW-22
Equipment : YSI 3500
HF SCIENTIFIC DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*SEE PRESSURE PROFILES	FOR WATER LEVEL DATA	
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0850	7.43	2.96	18.0	433	—	1ST RUN @ SCREEN 3; INITIAL PARAMETERS
0920	—	—	—	—	—	2ND RUN: SAMPLE MW-973-67
0940	7.76	2.89	18.2	426	—	3RD RUN: FINAL PARAMETERS
1100	7.72	27.4	20.1	607	—	1ST RUN @ SCREEN 2; INITIAL PARAMETERS
1115	7.72	13.2	20.0	605	—	2ND RUN: ATTEMPTING TO REDUCE TURBIDITY
1140	7.70	16.27	19.6	607	—	3RD RUN " " "
1315	7.68	8.88	20.5	616	—	4TH RUN " " "
1345	7.69	7.90	20.6	620	—	5TH RUN " " "
—	—	—	—	—	—	6TH RUN: COM FAILURE
1547	7.82	7.44	24.5	673	—	7TH RUN: ATTEMPTING TO REDUCE TURB.
1610	7.79	7.39	20.5	670	—	8TH RUN: UNABLE TO REDUCE TURB. WILL RETURN TOMORROW

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0227
Date : 10/14/97
Site Engineer : T. BLANEY/T. CHOI
Well Number : MW-22
Equipment : YSI 3500
HF SCIENTIFIC DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*SEE PRESSURE PROFILE FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments @SCREEN 2
1156	7.64	4.90	20.6	639	—	1ST RUN: INITIAL PARAMETERS
1215	—	—	—	—	—	2ND RUN: SAMPLE MW-973-66
1215	—	—	—	—	—	3RD RUN: SAMPLE MW-973-66 MS/MSD
1235	7.38	5.95	21.4	628	—	3RD RUN: FINAL PARAMETERS
1300	7.17	33.3	21.2	839	—	1ST RUN @ SCREEN 1; INIT. Parameters
1320	7.15	31.5	21.0	842	—	2ND RUN: ATTEMPTING TO REDUCE TURB.
1337	7.55	37.9	23.9	841	—	3RD RUN: " " "
1355	7.21	38.3	21.3	862	—	4TH RUN: " " "
1417	7.29	36.2	21.3	850	—	5TH RUN " " "
1438	7.17	41.5	23.5	886	—	6TH RUN " " "
						WILL RETURN TO SCREEN 1
						TOMORROW

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572
Date : 10/15/97
Site Engineer : J. BRENNAN / T. CHOI
Well Number : MW-22
Equipment : DRT-15C
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESSURE PROFILE FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft)
Diameter of Casing (ft)
Water Column Height (ft)
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) =
Casing Volumes Purged
Total Volume Purged (gals)

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0845	7.02	34.7	20.0	827	—	1ST RUN AT SCREEN #1; INITIAL PARAMETERS
1500	7.34	33.8	25.6	992	—	2ND RUN, AFTER APPROX. 3 PACKER VOLUMES PURGED
1505	—	—	—	—	—	MW-973-65 COLLECTED
1555	7.15	28.9	28.0	1022	—	LAST RUN AT SCREEN #1

Notes Sampling Procedures:

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0227
Date : 10-16-97
Site Engineer : J. BRENNER / T. CHOI
Well Number : MW-23
Equipment : YSI 3500
HF SCIENTIFIC DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*SEE PRESSURE PROFILE FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1000	7.21	15.53	24.2	1165	—	1ST RUN PRIOR SAMPLING @ SCREEN 1
1010	7.35	17.22	22.8	1135	—	2ND RUN: ATTEMPTING TO REDUCE TURBIDITY
1045	7.27	14.92	23.8	1141	—	3RD RUN: ATTEMPTING TO REDUCE TURB
1105	7.50	13.69	22.5	1134	—	4TH RUN; REDUCING TURBIDITY
1112	7.23	13.00	23.3	1149	—	5TH RUN: " "
1135	7.34	13.24	22.8	1124	—	6TH RUN: " "
						UNABLE TO REDUCE TURBIDITY: WILL
						RETURN LATER
1200	7.51	7.88	22.9	969	—	1ST RUN @ SCREEN 2, INITIAL PARAMETERS
1210	7.30	10.61	23.7	1019	—	2ND RUN: ATTEMPTING TO REDUCE TURBIDITY
1230	7.31	8.95	24.0	984	—	3RD RUN: " " " "
1256	7.61	7.68	24.0	982	—	4TH RUN " " " "
1315	7.39	6.48	22.7	965	—	5TH RUN " " " "
1330	7.34	4.92	21.8	949	—	6TH RUN " " " "
1350	—	—	—	—	—	MW-973-71 COLLECTED
1410	7.38	3.98	21.6	953	—	FINAL PARAMETERS

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0227
Date : 10-21-97
Site Engineer : J. BRENNER / T. CHOI

Well Number : MW-23
Equipment : YSI 3500
HE SCIENTIFIC DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESSURE PROFILES FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0830	7.32	3.04	17.5	403	—	1ST RUN AT SCREEN #5; INITIAL PARAMETERS
0845	—	—	—	—	—	MW-973-72 COLLECTED
0900	7.35	4.16	17.7	402	—	FINAL RUN; FINAL PARAMETERS
1150	7.30	7.56	23.4	374	—	1ST RUN @ SCREEN 4; INITIAL PARAMETERS
1220	7.31	4.88	23.8	367	—	2ND RUN: ATTEMPTING TO REDUCE TURB
1300	—	—	—	—	—	MW-973-73 COLLECTED
1346	7.25	7.10	21.7	340	—	4TH RUN; FINAL PARAMETERS
1415	8.39	1.76	21.9	403		1ST RUN AT SCREEN #5; INITIAL PARAMETERS
1430	—	—	—	—		MW-973-74 COLLECTED
1500	8.45	1.81	21.6	421		FINAL RUN; FINAL PARAMETERS
1520	7.31	14.08	20.9	1084		1ST RUN TO SCREEN #1, WILL PURGE FOR SEVERAL MINUTES, RETURN TO SAMPLE TOMORROW

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572
Date : 10/22/97
Site Engineer : T.CHOI / J.BRENNER

Well Number : MW-23
Equipment : DRT-15C
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESSURE PROFILES FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1045	6.72	3.44	21.9	1086	—	1ST RUN AT SCREEN 41'; INITIAL
						PARAMETERS
1105	—	—	—	—	—	2ND RUN; MW-973-70 QUESTED
1115	7.11	4.30	23.8	1141	—	3RD RUN; FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : ~~MW-24~~ JPL
Project Number : 1572.0227
Date : 10-6-97
Site Engineer : T. CHOI / J. BRENNER

Well Number : MW-24
Equipment : YSI 3500
HF SCIENTIFIC DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*SEE PRESSURE PROFILES	FOR WATER LEVEL DATA	
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1042	7.55	28.4	21.6	388	—	1ST RUN @ SCREEN 5: INITIAL PARAMETERS
1215	7.87	13.5	22.2	392	—	2ND RUN @ SCREEN 5
1235	7.85	5.65	23.3	403	—	3RD RUN @ SCREEN 5
1320	7.88	4.79	23.7	403	—	5TH RUN: SAMPLE MW-973-79
1340	7.72	4.55	23.1	401	—	6TH RUN: FINAL PARAMETERS
1410	7.85	11.8	23.1	367	—	1ST RUN @ SCREEN 4: INITIAL PARAMETERS
1435	7.91	5.89	22.5	367	—	2ND RUN: ATTEMPTING REDUCE TURBIDITY
1505	7.90	4.03	23.8	379	—	3RD RUN: " " "
1535	—	—	—	—	—	4TH RUN: SAMPLE MW-973-78
1550	7.82	3.97	21.9	364	—	5TH RUN: FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0227
Date : 10-7-97
Site Engineer : T. CHOU/J. BRENNER/T. BLANEY

Well Number : MW-24
Equipment : YSI 3500
HF SCIENTIFIC DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*SEE PRESSURE PROFILES FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0830	8.29	19.3	20.4	408	—	1ST RUN@SCREEN 3: INITIAL PARAMETERS
0850	7.70	15.1	20.8	407	—	2nd RUN: ATTEMPTING TO REDUCE TURBIDITY
0915	7.55	18.5	20.7	417	—	3rd RUN: " " "
0935	7.57	10.44	21.6	413	—	4th RUN: " " "
0955	7.63	11.53	21.8	415	—	5th RUN: " " "
1235	7.48	8.20	24.0	435	—	6th RUN: " " "
1300	7.59	10.60	23.2	427	—	7th RUN: " " "
1325	7.52	10.20	2	422	—	8th RUN: " " "
						WILL RETURN LATER TO THIS SCREEN
1345	8.01	1.56	21.8	380	—	1ST RUN@SCREEN 1: INITIAL PARAMETERS
1420	—	—	—	—	—	2nd RUN: SAMPLE MW-973-75
1420	—	—	—	—	—	SAMPLE MW-973-75 MS/MSD
1430	7.98	1.58	22.7	393	—	3rd RUN: FINAL PARAMETERS
1450	8.01	12.42	22.6	390	—	1ST RUN@SCREEN 2: INITIAL PARAMETERS
1510	8.06	10.57	22.5	391	—	2nd RUN: ATTEMPTING TO REDUCE TURBIDITY
1535	8.21	12.09	23.7	400	—	3rd RUN: " " "
1558	8.24	12.60	22.3	397	—	4th RUN: " " "
						WILL RETURN TO THIS SCREEN LATER

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0227
Date : 10/8/97
Site Engineer : TICHOL / ~~BRENNER~~

Well Number : MW-24
Equipment : YSI 3500
DRT-15C
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESSURE PROFILES FOR WATER LEVEL DATA		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

Depth of Well (ft) _____
Diameter of Casing (ft) _____
Water Column Height (ft) _____
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = _____
Casing Volumes Purged _____
Total Volume Purged (gals) _____

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1000	7.98	8.56	20.7	410	N/A	1ST RUN AT SCREEN # 2
1015	8.04	7.99	20.8	414	N/A	2ND RUN AT SCREEN # 2
1035	8.03	4.36	21.7	425	N/A	3RD RUN; READY TO SAMPLE
1050	~~8.03~~	—	~~21.6~~	—	—	4th RUN: SAMPLE MW-973-76
1150	8.07	4.17	21.6	422	-	Final Parameters Screen # 2
1220	7.72	4.63	21.9	412	—	1ST Run Screen # 3; Ready to Sample
1245						Sample MW-973-77
1306	7.89	5.85	22.1	420	-	Final Parameters Screen # 3

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 9/9/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-3

Elevation of Datum(ft msl): 1100.34 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: 85 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: T. Choi/M. Losi/G. Shaw

Ambient Reading (Pressure/Temperature/Time) Start: 14.07/23.68/12.36 | Finish: 14.12/18.64/1256

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	653	201.26			24.24	1242		260.74	839.60
			184.12						
			184.15						
			184.15						
				201.25					
4	558	159.98			24.26	1243		233.07	867.27
			154.95						
			154.95						
			154.95						
				159.99					
3	346	67.95			22.86	1248		161.67	938.67
			94.04						
			93.95						
			94.01						
				67.95					
2	252	27.11			20.67	1251		157.87	942.47
			54.89						
			54.90						
			54.91						
				27.18					
1	172	14.27			19.12	1254		149.65	950.69
			23.78						
			23.77						
			23.80						
				14.22					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 9/9/97 | Job No.: 1572

Serial No.: | Well Name: MW-4

Elevation of Datum(ft msl): 1082.84 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: 85 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: T. Choi/M. Losi/G. Shaw

Ambient Reading (Pressure/Temperature/Time) Start: 14.05/26.02/1133 | Finish: 14.11/21.93/1147

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	513	126.41			25.23	1136		220.31	862.53
			140.95						
			140.95						
			140.98						
				126.38					
4	392	73.73			23.91	1139		147.69	935.15
			120.00						
			120.00						
			119.97						
				73.73					
3	322	43.29			23.24	1142		139.31	943.53
			93.30						
			93.27						
			93.26						
				43.29					
2	240	14.26			22.62	1143		136.80	946.04
			58.83						
			58.80						
			58.82						
				14.27					
1	150	14.24			22.20	1145		129.05	953.79
			23.16						
			23.16						
			23.16						
				14.22					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 9/9/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-11

Elevation of Datum(ft msl): 1139.30 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: 85 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: T. Choi/M. Losi/G. Shaw

Ambient Reading (Pressure/Temperature/Time) Start: 14.05/24.11/1211 | Finish: 14.12/19.94/1228

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	639	158.50			23.81	1215		259.98	879.32
			178.41						
			178.38						
			178.38						
				158.50					
4	524	108.94			23.25	1217		199.40	939.90
			154.81						
			154.81						
			154.78						
				109.02					
3	429	68.12			21.46	1222		194.43	944.87
			115.78						
			115.78						
			115.75						
				68.14					
2	259	14.28			20.77	1224		178.64	960.66
			48.91						
			48.94						
			48.91						
				14.27					
1	149	14.21			20.13	1225		126.63	1012.67
			23.79						
			23.81						
			23.75						
				14.20					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 9/9/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-12

Elevation of Datum(ft msl): 1102.14 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: 85 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: T. Choi/M. Losi/G. Shaw

Ambient Reading (Pressure/Temperature/Time) Start: 14.05/26.08/1152 | Finish: 14.11/20.66/1205

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	548	97.80			24.80	1155		226.36	875.78
			153.52						
			153.49						
			153.52						
				97.81					
4	436	49.05			23.59	1157		168.78	933.36
			129.91						
			129.94						
			129.91						
				49.09					
3	323	14.33			22.29	1159		156.41	945.73
			86.32						
			86.29						
			86.28						
				14.38					
2	243	14.31			21.48	1201		153.33	948.81
			52.93						
			52.96						
			52.96						
				14.32					
1	140	14.27			20.87	1203	No water over measurement port		
			14.23						
			14.26						
			14.26						
				14.22					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 9/9/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-14

Elevation of Datum(ft msl): 1173.47 | Range: 0 to 750 psia | Weather: 85 degrees, sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: T. Choi/M. Losi/G. Shaw

Ambient Reading (Pressure/Temperature/Time) Start: 14.07/23.24/1059 | Finish: 14.12/20.49/1115

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	540	143.80			23.22	1105		204.53	968.94
			159.54						
			159.51						
			159.51						
				143.80					
4	456	107.23			22.90	1108		203.44	970.03
			123.59						
			123.59						
			123.56						
				107.22					
3	382	75.05			22.19	1109		203.35	970.12
			91.55						
			91.52						
			91.55						
				75.06					
2	277	29.39			21.45	1111		203.17	970.30
			46.10						
			46.10						
			46.10						
				29.40					
1	207	14.23			21.15	1113		202.28	971.19
			16.14						
			16.14						
			16.14						
				14.22					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 9/9/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-17

Elevation of Datum(ft msl): 1191.21 | Range: 0 to 750 psia | Weather: 85 degrees, sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: T. Choi/M. Losi/G. Shaw

Ambient Reading (Pressure/Temperature/Time) Start: 14.03/27.51/831 | Finish: 14.11/17.43/85

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	726	168.04			23.10	839		324.22	866.99
			188.23						
			188.26						
			188.23						
				168.04					
4	582	105.40			21.39	842		314.92	876.29
			129.86						
			129.83						
			129.86						
				105.49					
3	468	55.94			19.23	844		268.60	922.61
			100.53						
			100.50						
			100.50						
				55.93					
2	370	14.28			18.18	847		255.87	935.34
			63.54						
			63.56						
			63.53						
				14.27					
1	250	14.24			17.65	849		241.67	949.54
			17.68						
			17.68						
			17.68						
				14.22					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 9/9/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-18

Elevation of Datum(ft msl): 1225.41 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: 85 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: T. Choi/M. Losi/G. Shaw

Ambient Reading (Pressure/Temperature/Time) Start: 14.05/20.17/902 | Finish: 14.12/19.12/920

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	684	150.24			22.43	911		328.07	897.34
			168.36						
			168.39						
			168.39						
				150.27					
4	564	98..09			22.34	913		313.79	911.62
			122.55						
			122.55						
			122.55						
				98.12					
3	424	37.27			21.07	915		287.73	937.68
			73.15						
			73.15						
			73.18						
				37.32					
2	330	14.26			20.11	916		280.12	945.29
			35.71						
			35.71						
			35.71						
				14.24					
1	270	14.24			19.51	918	No water over measurement port		
			14.26						
			14.23						
			14.26						
				14.24					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 9/9/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-19

Elevation of Datum(ft msl): 1142.94 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: 85 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: T. Choi/M. Losi/G. Shaw

Ambient Reading (Pressure/Temperature/Time) Start: 14.06/24.82/1003 | Finish: 14.10/19.48/1017

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	498	49.75			22.36	1007		314.64	828.30
			93.57						
			93.57						
			93.56						
				49.80					
4	444	26.26			20.70	1009		311.59	831.35
			71.48						
			71.48						
			71.48						
				26.26					
3	392	14.35			20.00	1010		213.78	929.16
			91.33						
			91.33						
			91.36						
				14.37					
2	314	14.30			19.86	1013		208.99	933.95
			59.60						
			59.60						
			59.60						
				14.32					
1	242	14.28			19.69	1015		198.61	944.33
			32.89						
			32.89						
			32.89						
				14.24					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 9/9/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-20

Elevation of Datum(ft msl): 1165.05 | Range: 0 to 750 psia | Weather: 85 degrees, sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: T. Choi/M. Losi/G. Shaw

Ambient Reading (Pressure/Temperature/Time) Start: 14.05/22.78/930 | Finish: 14.13/18.68/951

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	900	268.27			23.47	935		228.75	936.30
			305.07						
			305.10						
			305.06						
				268.29					
4	700	181.38			23.63	938		266.81	898.24
			201.89						
			201.89						
			201.86						
				182.58					
3	562	121.46			22.74	943		257.55	907.50
			146.05						
			146.08						
			146.08						
				121.46					
2	392	47.54			21.14	945		232.75	932.30
			83.11						
			83.13						
			83.13						
				47.57					
1	230	14.28			19.05	949	No water over measurement port		
			14.27						
			14.23						
			14.23						
				14.26					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 9/9/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-21

Elevation of Datum(ft msl): 1059.10 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: 85 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: T. Choi/M. Losi/G. Shaw

Ambient Reading (Pressure/Temperature/Time) Start: 14.05/24.95/1031 | Finish: 14.16/20.26/1048

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	372	115.50			23.62	1034		95.66	963.44
			133.88						
			133.91						
			133.91						
				115.53					
4	310	88.54			22.90	1036		95.64	963.46
			107.03						
			107.03						
			107.03						
				88.55					
3	240	58.58			21.25	1040		94.36	964.74
			77.26						
			77.23						
			77.23						
				58.57					
2	161	24.15			20.36	1045		94.04	965.06
			43.11						
			43.14						
			43.14						
				24.14					
1	90	14.21			20.26	1046	No water over measurement port		
			14.22						
			14.22						
			14.22						
				14.22					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 9/9/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-22

Elevation of | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Datum(ft msl): 1176.98 | Weather: 85 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: T. Choi/M. Losi/G. Shaw

Ambient Reading (Pressure/Temperature/Time) Start: 14.06/25.06/1332 | Finish: 14.08/21.77/1345

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	588	177.19			24.17	1335		244.59	932.39
			162.95						
			162.95						
			162.92						
				177.19					
4	467	124.79			23.70	1338		233.30	943.68
			115.38						
			115.38						
			115.38						
				124.75					
3	389	90.96			23.19	1340		216.15	960.83
			88.98						
			89.01						
			89.01						
				90.95					
2	329	64.92			22.66	1341		216.34	960.64
			62.91						
			62.91						
			62.91						
				64.96					
1	245	28.05			22.04	1343		214.67	962.31
			27.22						
			27.22						
			27.21						
				28.06					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 9/9/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-23

Elevation of Datum(ft msl): 1108.84 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: 85 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: T. Choi/M. Losi/G. Shaw

Ambient Reading (Pressure/Temperature/Time) Start: 14.09/24.25/1540 | Finish: 14.09/22.89/1610

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	542	171.94			27.70	1550		176.79	932.05
			172.41						
			172.41						
			172.41						
				171.94					
4	445	129.72			26.57	1554		174.57	934.27
			131.32						
			131.32						
			131.32						
				129.72					
3	319	74.90			25.23	1556		153.58	955.26
			85.80						
			85.80						
			85.80						
				74.91					
2	254	46.64			24.23	1558		153.24	955.60
			57.77						
			57.77						
			57.77						
				46.63					
1	174	14.24			23.20	1600		148.76	960.08
			25.03						
			25.03						
			25.03						
				14.24					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 9/9/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-24

Elevation of Datum(ft msl): 1200.94 | Range: 0 to 750 psia | Weather: 85 degrees, sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: T. Choi/M. Losi/G. Shaw

Ambient Reading (Pressure/Temperature/Time) Start: 13.98/23.13/1304 | Finish: 14.11/21.72/1321

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	678	204.82			23.78	1309		294.67	906.27
			180.23						
			180.20						
			180.23						
				204.82					
4	554	151.14			23.56	1312		273.00	927.94
			135.86						
			135.86						
			135.86						
				151.14					
3	435	99.49			23.28	1315		249.82	951.12
			94.33						
			94.30						
			94.33						
				99.46					
2	373	72.69			23.12	1318		247.36	953.58
			68.50						
			68.53						
			68.50						
				72.65					
1	279	31.91			22.45	1320		241.76	959.18
			30.21						
			30.18						
			30.18						
				31.93					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/29/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-3

Elevation of Datum(ft msl): 1100.34 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: 80 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner/M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.12/21.02/1055 | Finish: 14.50/20.87/1116

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	653	159.41			22.84	1058		265.74	834.60
			182.18						
			182.21						
			182.17						
				159.40					
4	558	118.14			23.49	1102		237.03	863.31
			153.45						
			153.42						
			153.48						
				118.11					
3	346	26.04			22.84	1106		165.22	935.12
			92.67						
			92.70						
			92.66						
				26.06					
2	252	14.26			22.24	1110		162.34	938.00
			53.16						
			53.19						
			53.18						
				14.29					
1	172	14.31			21.23	1114		156.20	944.14
			21.19						
			21.13						
			21.16						
				14.32					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/29/97 | Job No.: 1572

Serial No.: | Well Name: MW-4

Elevation of Datum(ft msl): 1082.84 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: 80 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner/M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.11/24.12/1329 | Finish: 14.17/21.70/1350

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	513	126.12			23.92	1336		223.93	858.91
			139.43						
			139.46						
			139.46						
				126.15					
4	392	73.46			23.55	1339		150.02	932.82
			119.02						
			119.05						
			119.05						
				73.47					
3	322	43.03			23.03	1341		141.82	941.02
			92.26						
			92.23						
			92.25						
				43.04					
2	240	14.29			22.31	1345		139.91	942.93
			57.53						
			57.56						
			57.50						
				14.31					
1	150	14.28			21.95	1349		132.66	950.18
			21.64						
			21.66						
			21.67						
				14.29					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/29/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-11

Elevation of Datum(ft msl): 1139.30 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: 80 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner/M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.14/21.19/1403 | Finish: 14.21/19.89/1417

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	639	158.26			22.42	1407		263.21	876.09
			177.07						
			177.10						
			177.07						
				158.25					
4	524	108.73			22.41	1409		200.74	938.56
			154.31						
			154.34						
			154.28						
				108.70					
3	429	67.88			21.73	1411		195.91	943.39
			115.03						
			115.60						
			115.03						
				67.88					
2	259	14.28			20.54	1414		181.92	957.38
			47.58						
			47.61						
			47.58						
				14.31					
1	149	14.30			20.07	1417		129.13	1010.17
			22.77						
			22.80						
			22.79						
				14.28					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/29/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-12

Elevation of Datum(ft msl): 1102.14 | Range: 0 to 750 psia | Weather: 80 degrees, sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner/M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.07/22.73/1343 | Finish: 14.14/20.43/1357

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	548	97.66			23.04	1346		229.60	872.54
			152.12						
			152.15						
			152.12						
				97.63					
4	436	48.92			22.55	1349		171.33	930.81
			128.84						
			128.81						
			128.87						
				48.95					
3	323	14.34			21.57	1351		159.64	942.50
			84.89						
			84.92						
			84.95						
				14.31					
2	243	14.35			20.99	1354		157.14	945.00
			51.31						
			51.34						
			51.33						
				14.32					
1	140	14.28			20.67	1356	No water over measurement port		
			14.30						
			14.33						
			14.30						
				14.29					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/29/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-14

Elevation of Datum(ft msl): 1173.47 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: 80 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner/M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.10/25.91/1209 | Finish: 14.15/21.05/1218

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	540	143.53			23.98	1208		200.40	973.07
			161.35						
			161.32						
			161.35						
				143.56					
4	456	106.94			23.29	1210		200.01	973.46
			125.08						
			125.11						
			125.10						
				107.02					
3	382	74.77			22.51	1212		200.06	973.41
			93.02						
			92.99						
			92.98						
				74.80					
2	277	29.08			21.59	1213		200.56	972.91
			47.24						
			47.27						
			47.28						
				29.11					
1	207	14.30			21.14	1215		200.36	973.11
			17.01						
			16.97						
			17.03						
				14.28					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/29/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-17

Elevation of Datum(ft msl): 1191.21 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: 80 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner/M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.60/16.21/830 | Finish: 14.58/16.70/085

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	726	173.58			19.47	834		328.17	863.04
			187.04						
			187.07						
			187.04						
				173.56					
4	582	111.07			19.16	839		318.81	872.40
			128.68						
			128.67						
			128.70						
				111.01					
3	468	61.49			18.02	844		274.16	917.05
			98.62						
			98.65						
			98.59						
				61.53					
2	370	18.81			17.34	847		261.70	929.51
			61.55						
			61.52						
			61.55						
				18.77					
1	250	14.30			16.89	849	No water over measurement port		
			14.26						
			14.29						
			14.27						
				14.28					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/29/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-18

Elevation of Datum(ft msl): 1225.41 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: 80 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner/M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.12/17.55/0902 | Finish: 14.13/18.47/0919

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	684	149.92			20.63	905		327.89	897.52
			168.49						
			168.52						
			168.49						
				149.92					
4	564	97.78			21.27	908		316.88	908.53
			121.25						
			121.28						
			121.22						
				97.80					
3	424	37.01			20.03	911		292.37	933.04
			71.17						
			71.20						
			71.19						
				36.99					
2	330	14.29			18.81	915		286.73	938.68
			32.87						
			32.90						
			32.88						
				14.35					
1	270	14.28			18.59	918	No water over measurement port		
			14.31						
			14.30						
			14.29						
				14.30					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/29/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-19

Elevation of Datum(ft msl): 1142.94 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: 80 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner/M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.03/20.15/1026 | Finish: 14.18/18.57/1048

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	498	94.91			19.61	1030		319.09	823.85
			91.68						
			91.64						
			91.67						
				94.96					
4	444	71.45			19.15	1035		316.00	826.94
			69.58						
			69.61						
			69.59						
				71.46					
3	392	48.85			19.13	1039		217.18	925.76
			89.88						
			89.91						
			89.88						
				48.83					
2	314	14.83			19.05	1043		212.61	930.33
			58.04						
			58.07						
			58.06						
				14.77					
1	242	14.30			18.75	1047		203.40	939.54
			30.82						
			30.85						
			30.84						
				14.28					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/29/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-20

Elevation of Datum(ft msl): 1165.05 | Range: 0 to 750 psia | Weather: 80 degrees, sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner/M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.13/20.07/0935 | Finish: 14.26/19.04/10.02

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	900	267.58			22.99	948		231.19	933.86
			304.12						
			304.11						
			304.14						
				267.55					
4	700	180.67			23.27	951		257.77	907.28
			205.91						
			205.88						
			205.91						
				180.74					
3	562	120.79			22.33	956		242.33	922.72
			152.76						
			152.79						
			152.76						
				120.78					
2	392	46.87			20.60	958		233.96	931.09
			82.69						
			82.71						
			82.71						
				46.86					
1	230	14.32			19.38	1000	No water over measurement port		
			14.38						
			14.37						
			14.36						
				14.39					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/29/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-21

Elevation of Datum(ft msl): 1059.10 | Range: 0 to 750 psia | Weather: 80 degrees, sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner/M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.15/22.61/1130 | Finish: 14.18/20.16/1155

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	372	122.70			22.38	1134		95.52	963.58
			134.03						
			134.00						
			134.03						
				122.67					
4	310	95.71			22.04	1138		95.41	963.69
			107.17						
			107.20						
			107.20						
				95.70					
3	240	65.69			21.52	1142		94.39	964.71
			77.28						
			77.31						
			77.27						
				65.70					
2	161	31.26			21.01	1146		94.37	964.73
			43.07						
			43.04						
			43.04						
				31.24					
1	90	14.27			20.16	1150	No water over measurement port		
			14.30						
			14.27						
			14.31						
				14.28					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/29/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-22

Elevation of Datum(ft msl): 1176.98 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: 80 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner/M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.10/24.01/1502 | Finish: 14.13/21.78/1525

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	588	158.96			23.91	1506		245.59	931.39
			162.53						
			162.56						
			162.56						
				158.93					
4	467	106.31			23.58	1510		233.59	943.39
			115.29						
			115.32						
			115.29						
				106.30					
3	389	72.38			22.94	1514		215.86	961.12
			89.18						
			89.15						
			89.19						
				72.43					
2	329	46.32			22.43	1518		216.37	960.61
			62.92						
			62.95						
			62.95						
				46.33					
1	245	14.29			21.82	1522		216.86	960.12
			26.34						
			26.31						
			26.29						
				14.32					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/29/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-23

Elevation of Datum(ft msl): 1108.84 | Range: 0 to 750 psia | Weather: 80 degrees, sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner/M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.11/24.13/1239 | Finish: 14.17/21.67/1303

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	542	139.56			23.83	1242		176.27	932.57
			172.69						
			172.65						
			172.71						
				139.57					
4	445	97.37			23.29	1246		175.89	932.95
			130.79						
			130.82						
			130.79						
				97.39					
3	319	42.57			22.64	1250		154.62	954.22
			85.40						
			85.37						
			85.43						
				42.61					
2	254	14.31			22.20	1254		154.67	954.17
			57.21						
			57.18						
			57.21						
				14.34					
1	174	14.28			21.83	1257		151.90	956.94
			23.72						
			23.69						
			23.75						
				14.30					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/29/97 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-24

Elevation of Datum(ft msl): 1200.94 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: 80 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner/M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.29/21.49/1427 | Finish: 14.24/21.78/1443

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	678	188.66			23.09	1432		297.11	903.83
			179.38						
			179.35						
			179.41						
				188.68					
4	554	134.79			23.13	1434		274.69	926.25
			135.34						
			135.37						
			135.33						
				134.79					
3	435	83.08			23.04	1437		251.58	949.36
			93.77						
			93.80						
			93.76						
				83.08					
2	373	56.12			22.91	1439		250.17	950.77
			67.51						
			67.54						
			67.48						
				56.10					
1	279	15.25			22.31	1441		247.32	953.62
			28.01						
			27.95						
			28.03						
				15.28					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: _____ Depth: 172 Date: 9-15-97

Well Name: MW-3 Sampling Zone No.: SCREEN 1 Starting Time: 0930 Finishing Time: 1015

Technicians T.CHOI/M.LOSI

Water Level Inside MP Casing (Beginning of Session) 14.24 PSIA (End of Session) 14.27 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.24	✓	0934	0939	✓	14.24	1.0	1ST RUN PRIOR SAMPLING; RINSE BOTTLES W/FORMATION WATER; INITIALS
2	✓	✓	✓	✓	✓	✓	14.18	✓	0949	0954	✓	14.24	1.0	2ND RUN: SAMPLE MW-973-02. 2 VOA'S METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	14.16	✓	1008	1013	✓	14.27	1.0	3RD RUN: SAMPLE MW-973-02; Cr^{+6} PERCHLORATE, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: _____ Total Volume: 3.0

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: _____ Depth: 252 Date: 9-15-97

Well Name: MW-3 Sampling Zone No.: SCREEN 2 Starting Time: 0815 Finishing Time: 0926

Technicians T.CHOI / M.LOSL

Water Level Inside MP Casing (Beginning of Session) 14.25 PSIA (End of Session) 14.29 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.25	✓	0831	0835	✓	14.41	1.0	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/FORMATION WATER, INITIAL PARAMETE
2	✓	✓	✓	✓	✓	✓	14.25	✓	0850	0854	✓	14.28	1.0	2ND RUN: SAMPLE MW-973-03; 2VOA'S, METALS, ANIONS, ½Cr+6
3	✓	✓	✓	✓	✓	✓	14.24	✓	0909	0913	✓	14.29	1.0	3RD RUN: SAMPLE MW-973-03: ½Cr+6 PERCHLORATE; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

F2

Comments: _____ Total Volume: 3.0

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 346 Date: 9-12-97

Well Name: MW-3 Sampling Zone No.: SCREEN 3 Starting Time: 1250 Finishing Time: 1415

Technicians TCH01/MLO51

Water Level Inside MP Casing (Beginning of Session) 27.88 PSIA (End of Session) 26.84 PSIA

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	27.88	✓	1257	1259	✓	27.90	1.0	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/FORMATION WATER, INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	27.85	✓	1318	1321	✓	27.90	1.0	2ND RUN: ATTEMPTING TO REDUCE TURBIDITY; SAMPLE MW-973-04: Metals
3	✓	✓	✓	✓	✓	✓	27.86	✓	1343	1347	✓	27.93	1.0	3RD RUN: SAMPLE MW-973-04: 2 VOA's, ANIONS, Cr^{+6}, PERCHLORATE
4	✓	✓	✓	✓	✓	✓	26.85	✓	1402	1405	✓	~~26~~ 27.84	0.5	4TH RUN: FINAL PARAMETERS
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: Total Volume: 3.5

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 558 Date: 9-12-97

Well Name: MW-3 Sampling Zone No.: SCREEN 4 Starting Time: 1130 Finishing Time: 1248

Technicians T.CHOI/M.LOSI

Water Level Inside MP Casing (Beginning of Session) 120.08 PSIA (End of Session) 119.05 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	120.08	✓	1144	1147	✓	120.09	1.0	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/FORMATION WATER; INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	120.05	✓	1208	1210	✓	120.02	1.0	2ND RUN: SAMPLE MW-97305; 2VOAs; METALS, ANIONS, Cr^{+6}
3	✓	✓	✓	✓	✓	✓	119.05	✓	1234	1237	✓	119.05	0.5	3RD RUN: SAMPLE MW-97305; PERCHL FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: Total Volume: 2.5

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3, SCREEN 5 Depth: 653 Date: 9-12-97

Well Name: MW-3 Sampling Zone No.: SCREEN 5 Starting Time: 0950 Finishing Time: 1130

Technicians T.CHOI, M.LOSI

Water Level Inside MP Casing (Beginning of Session) 161.45 PSIA (End of Session) 161.39 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	161.45	✓	1010	1014	✓	161.45	1.0	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/FORMATION WATER, INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	161.41	✓	1040	1043	✓	161.39	1.0	2ND RUN: SAMPLE MW-973-06: 2 VOA's METALS, ANIONS, Cr+6
3	✓	✓	✓	✓	✓	✓	161.39	✓	1111	1114	✓	161.39	1.0	3RD RUN: SAMPLE MW-973-06; PERCHLOR. & FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

F2

Comments:

Total Volume: 3.0

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 150 Date: 9/24/97

Well Name: MW-4 Sampling Zone No.: 1 Starting Time: 0820 Finishing Time: 0958

Technicians M. Losi, J. Baenen, T. BLANEY

Water Level Inside MP Casing (Beginning of Session) 14.04 psia (End of Session) 14.19 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.04	✓	0831	0835	✓	14.22	1	1ST Run; NTU's = 8.5; Reducing TURBIDITY
2	✓	✓	✓	✓	✓	✓	14.04	✓	0849	0854	✓	14.22	1	2ND Run; NTU's = 6.8; Reducing TURBIDITY
3	✓	✓	✓	✓	✓	✓	14.02	✓	0905	0910	✓	14.19	1	3RD Run; NTU's = 4.76; Ready to Sample
4	✓	✓	✓	✓	✓	✓	14.02	✓	0921	0926	✓	14.19	1	Sample MW-973-07; VOA's metals metals ms/msd
5	✓	✓	✓	✓	✓	✓	14.06	✓	0936	0940	✓	14.21	1	Sample MW-973-07; metals ms/msd ANIONS, Cr++
6	✓	✓	✓	✓	✓	✓	14.05	✓	0949	0951	✓	14.19	1	Sample MW-973-07; ClO_4 + Final Parameters
7														
8														
9														
10														
11														
12														

F-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 240 Date: 9/24/97

Well Name: MW-4 Sampling Zone No.: 2 Starting Time: 1000 Finishing Time: 1120

Technicians T. BLANEY, M. LOSI, J. BRENNER

Water Level Inside MP Casing (Beginning of Session) 14.07 (End of Session) 14.24

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	14.07	✓	1006	1009	✓	14.21	1	IST Run; NTUs = 3.51; Ready to Sample
2	✓	✓	✓	✓	✓	✓	14.09	✓	1020	1023	✓	14.23	1	Sample MW-973-08; VOAs, metals; ½ ANIONS Sample MW-973-09; VOAs, metals, ~~½ ANIONS~~
3	✓	✓	✓	✓	✓	✓	14.09	✓	1058	1101	✓	14.24	1	SAmple MW-973-08; ½ ANIONS, Cr^{+6}, ClO_4 Sample MW-973-09; Cr^{+6}, ClO_4
4	✓	✓	✓	✓	✓	✓	14.10	✓	1114	1115	✓	14.24	0.5	FINAL Parameters
5														
6														
7														
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F-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 322 Date: 9/24/97

Well Name: MW-4 Sampling Zone No.: 3 Starting Time: 1124 Finishing Time: 1212

Technicians: J. Brennen, M. Losi, T. Blaney

Water Level Inside MP Casing (Beginning of Session) 45.19 psia (End of Session) 45.10

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	45.19	✓	1130	1132	✓	45.19	1	1ST Run; NTU's = 1.42 Ready to Sample
2	✓	✓	✓	✓	✓	✓	45.16	✓	1146	1148	✓	45.15	1	Sample MW-973-10; VOA's, metals ANIONS, Cr^{+6}
3	✓	✓	✓	✓	✓	✓	45.14	✓	1202	1204	✓	45.10	1	Sample MW-973-10; ClO_4 + Final Parameters
4														
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F-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 392 Date: 9/24/97

Well Name: MW-4 Sampling Zone No.: 4 Starting Time: 1220 Finishing Time: 1315

Technicians T. BLANEY, M. LOSI, S. BRENNER

Water Level Inside MP Casing (Beginning of Session) 75.58 psia (End of Session) * 74.96

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	75.58	✓	12.28	1231	✓	75.55	1	1ST RUN: INITIAL PARAMETERS, RINSE BOTTLES W/FORMATION WATER
2	✓	✓	✓	✓	✓	✓	75.55	✓	1248	1251	✓	75.53	1	2ND RUN: SAMPLE MW-973-11 VOCs, METALS, ANIONS, Cr(VI)
3	✓	✓	✓	✓	✓	✓	* 74.95	✓	1309	1311	✓	* 74.96	0.75	3RD RUN; SAMPLE MW-973-4, ClO_4; FINAL PARAMETERS
4														
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11														
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F-2

Comments: * ONLY 3 BOTTLES SENT DOWN Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 513 Date: 9/24/97

Well Name: MW-4 Sampling Zone No.: 5 Starting Time: 1325 Finishing Time: 1433

Technicians J. Brenney, M. Losi, T. Blaney

Water Level Inside MP Casing (Beginning of Session) 128.06 psia (End of Session) 128.00

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	128.06	✓	1333	1336	✓	128.10	1	1ST Run; NTU's = 3.92; Ready to Sample
2	✓	✓	✓	✓	✓	✓	128.00	✓	1355	1357	✓	128.00	1	Sample MW-973-12; VOAs, metal ANIONS, Cr+6
3	✓	✓	✓	✓	✓	✓	128.01	✓	1420	1422	✓	128.00	1	Sample MW-973-12; ClO_4 + Final Parameters
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1-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 149 Date: 10-2-97

Well Name: MW-11 Sampling Zone No.: SCREEN 1 Starting Time: 0800 Finishing Time: 0905

Technicians T. BLANEY, J. BRENNER, T. CHOI, M. LOSI

Water Level Inside MP Casing (Beginning of Session) 14.15 PSIA (End of Session) 14.18 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.15	✓	808	0815	✓	14.18	1.0	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/FORMATION WATER; INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	14.09	✓	0827	0833	✓	14.16	1.0	2ND RUN; SAMPLE MW-973-20; 2 VOAs, METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	14.10	✓	0845	0852	✓	14.18	1.0	3RD RUN; SAMPLE MW-973-20; Final Parameters
4														
5														
6														
7														
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12														

F-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: _____ Depth: 259 Date: 10-1-97

Well Name: MW-11 Sampling Zone No.: SCREEN 2 Starting Time: 1440 Finishing Time: 1530

Technicians: T. BLANEY, J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 14.13 PSIA (End of Session) 14.19

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	14.13	✓	1443	1447	✓	14.24	1.0	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/FORMATION WATER: INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	14.17	✓	1500	1505	✓	14.26	1.0	2ND RUN; SAMPLE MW-973-21 MS/MSD; 4 VOAs SAMPLE MW-973-21: 2 VOAs, METALS, ½ ANIONS
3	✓	✓	✓	✓	✓	✓	14.17	✓	1517	1522	✓	14.19	1.0	3RD RUN; SAMPLE MW-973-21; ½ ANIONS, Cr^{+6}, PERCHLOR, FINAL PARAMETERS
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Comments: _____ Total Volume: 3.0L

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 429 Date: 10-1-97

Well Name: MW-11 Sampling Zone No.: SCREEN 3 Starting Time: 1330 Finishing Time: 1435

Technicians T. BLANEY, J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 69.94 psia (End of Session) 69.89 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	69.94	✓	1339	1343	✓	69.94	1.0	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/FORMATION WATER; INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	69.87	✓	1401	1405	✓	69.90	1.0	SAMPLE MW-973-22; VOAs, metals, ANIONS, Cr^{+6}
3	✓	✓	✓	✓	✓	✓	69.90	✓	1424	1427	✓	69.89	1.0	SAMPLE MW-973-22; ClO_4 + Final Parameters
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Comments:

Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: _____ Depth: 524 Date: 10-1-97

Well Name: MW-91 Sampling Zone No.: SCREEN 4 Starting Time: 1207 Finishing Time: 1320

Technicians T. BLANEY, J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 110.87 PSIA (End of Session) 110.34 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	110.87	✓	1213	1216	✓	110.87	1.0	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/FORMATION WATER: INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	110.85	✓	1236	1240	✓	110.85	1.0	2ND RUN: SAMPLE MW-973-23 - 2 VOA's, METALS, ANIONS, Cr+6
3	✓	✓	✓	✓	✓	✓	110.44	✓	1315	1318	✓	110.34	0.75	3RD RUN: Samp6 MW-973-23; ClO_4 + Final Parameters
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12														

F-2

Comments: _____ Total Volume: 2.75 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 639 Date: 10-1-97

Well Name: MW-11 Sampling Zone No.: SCREEN 5 Starting Time: 1045 Finishing Time: 1205

Technicians T. BLANEY, J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 160.51 PSIA (End of Session) 160.39 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	160.51	✓	1056	1059	✓	160.45	1.0	1ST RUN PRIOR SAMPLING! RINSE BOTTLES INFORMATION WATER; INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	160.45	✓	1121	1125	✓	160.42	1.0	2ND RUN! SAMPLE MW-973-24:VOAS, METALS, ANIONS, Cr^{+6}
3	✓	✓	✓	✓	✓	✓	160.44	✓	1148	1151	✓	160.39	1.0	3RD Run: Sample MW-973-24:Clay + Final Parameters
4														
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F2

Comments: Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 243 Date: 10/2/97

Well Name: MW-12 Sampling Zone No.: 2 Starting Time: 1350 Finishing Time: 1444

Technicians T. BLANEY, J. Brenner, M. Losi

Water Level Inside MP Casing (Beginning of Session) 14.15 psia (End of Session) 14.27 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.15	✓	1359	1403	✓	14.30	1	1st Run; NTU's = 3.37; Ready to Sample
2	✓	✓	✓	✓	✓	✓	14.18	✓	1416	1419	✓	14.29	1	Sample MW-973-27; VOA's, metals Anions, Cr+6;
3	✓	✓	✓	✓	✓	✓	14.14	✓	1434	1437	✓	14.27	1	Sample MW-973-27; ClO4 + Final Parameters
4														
5														
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F-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 323 Date: 10/2/97

Well Name: MW-12 Sampling Zone No.: SCREEN 3 Starting Time: 1222 Finishing Time: 1345

Technicians T.BLANEY, J.BRENNER, T.CHOI, M.LOSI

Water Level Inside MP Casing (Beginning of Session) 14.18 psia (End of Session) 14.28 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.18	✓	1226	1229	✓	14.29	1	1ST Run; NTU's = 5.5; Reducing TURBIDITY
2	✓	✓	✓	✓	✓	✓	14.18	✓	1244	1246	✓	14.30	1	2ND Run; NTU's = 8.2; Reducing TURBIDITY
3	✓	✓	✓	✓	✓	✓	14.18	✓	1302	1305	✓	14.29	1	3RD Run; NTU's = 4.18; Ready to Sample
4	✓	✓	✓	✓	✓	✓	1423	✓	1324	1324	✓	1432	1	Sample MW-973-28 + VOA's metals, ANION, Cr^{+6}.
5	✓	✓	✓	✓	✓	✓	14.24	✓	1338	1341	✓	14.28	1	Sample MW-973-28; ClO_4 + Final Parameters.
6														
7														
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F-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 436 Date: 10-2-97

Well Name: MW-12 Sampling Zone No.: SCREEN 4 Starting Time: 1110 Finishing Time: 1215

Technicians T. BLANEY, J. BRENNER, T. CHOI, M. LOST

Water Level Inside MP Casing (Beginning of Session) 50.93 PSIA (End of Session) 50.94 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	50.93	✓	1116	1119	✓	50.94	1.0	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/FORMATION WATER; INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	50.95	✓	1139	1142	✓	50.96	1.0	2ND RUN: Sample MW-973-29; VOA's metals, Anions + Cr+6
3	✓	✓	✓	✓	✓	✓	50.92	✓	1204	1207	✓	50.94	1.0	Sample MW-973-29; ClO4 + Final Parameters.
4														
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F-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 548 Date: 10-2-97

Well Name: MW-12 Sampling Zone No.: SCREEN 5 Starting Time: 0925 Finishing Time: 1100

Technicians T. BLANEY, J. BRENNER, T. CHOI, M. LOSI

Water Level Inside MP Casing (Beginning of Session) 99.75 PSIA (End of Session) 99.65 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	99.75	✓	0935	0938	✓	99.75	1.0	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/ FORMATION WATER. INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	99.71	✓	1001	1004	✓	99.72	1.0	2ND RUN: SAMPLE MW-973-30: 2 VOAS, 1L METALS, [redacted]
3	✓	✓	✓	✓	✓	✓	99.71	✓	1025	1028	✓	99.68	1.0	3RD RUN: SAMPLE MW-973-30: ANIONS, PERCHLORATE, Cr+6
4	✓	✓	✓	✓	✓	✓	99.65	✓	1053	1055	✓	99.65	1.0	4TH RUN: FINAL PARAMETERS
5														
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12														

F-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: _____ Depth: 207' Date: 9-25-97

Well Name: MW-14 Sampling Zone No.: SCREEN 1 Starting Time: 1154 Finishing Time: 1300

Technicians T.CHOI/M.LOSI/J.BRENNER

Water Level Inside MP Casing (Beginning of Session) 14.03 PSIA (End of Session) 14.05 PSIA

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	14.03	✓	1157	1203	✓	14.09	1.0	1ST RUN PRIOR SAMPLING; RINSE BOTTLES W/FORMATION WATER; INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	14.05	✓	1218	1224	✓	14.04	1.0	2ND RUN; SAMPLE MW-973-33; 2 VOA'S METALS/ANIONS
3	✓	✓	✓	✓	✓	✓	14.04	✓	1238	1244	✓	14.05	1.0	3RD RUN; SAMPLE MW-973-33; ½ ANIONS CrVI, PERCHLORATE, FINAL PARAMETERS
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F-2

Comments: _____ Total Volume: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 277 Date: 9/28/22

Well Name: MW-14 Sampling Zone No.: SCREEN 2 Starting Time: ~~1310~~ 1325 Finishing Time: 1520

Technicians T.CHOI/M.LOSI/J.BRENNER

Water Level Inside MP Casing (Beginning of Session) 31.16 PSIA (End of Session) 30.55 psia

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	31.16	✓	1313	1317	✓	31.18	1.0	1ST RUN PRIOR SAMPLING; RINSE BOTTLES W/FORMATION WATER; INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	31.17	✓	1334	1339	✓	31.18	1.0	2ND RUN: ATTEMPTING TO REDUCE TURBIDITY NTU'S = 12.15
3	✓	✓	✓	✓	✓	✓	31.14	✓	1352	1357	✓	31.17	1.0	3RD RUN: ATTEMPTING TO REDUCE TURBIDITY NTU'S = 10.94
4	✓	✓	✓	✓	✓	✓	31.14	✓	1415	1419	✓	31.16	1.0	4TH RUN: ATTEMPTING TO REDUCE TURBIDITY NTU'S = 10.80
5	✓	✓	✓	✓	✓	✓	31.14	✓	1435	1440	✓	31.14	1.0	5TH RUN: ATTEMPTING TO REDUCE TURBIDITY NTU'S = 3.22
6	✓	✓	✓	✓	✓	✓	31.13	✓	1455	1500	✓	31.12	1.0	6TH RUN: SAMPLE MW-973-34; 2 VOA'S, METALS, ANIONS, Cr^{+6}
7	✓	✓	✓	✓	✓	✓	30.54	✓	1513	1517	✓	30.55	1.0	7TH RUN: SAMPLE MW-973-34; PERCHLOR, FINAL PARAMETERS
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11														
12														

F-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 382 Date: 9/25/97

Well Name: MW-14 Sampling Zone No.: 3 Starting Time: 1530 Finishing Time: 1625

Technicians T. BLANEY, J. Brenner, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 76.75 psia (End of Session) 76.22

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	76.75	✓	1538	1541	✓	76.77	1	1ST Run; NTUs = 2.94; Ready to Sample
2	✓	✓	✓	✓	✓	✓	76.72	✓	1557	1559	✓	76.74	1	Sample MW-973-35. VOAs, metals, Anions, Cr+6
3	✓	✓	✓	✓	✓	✓	76.20	✓	1616	1618	✓	76.22	0.75	Sample MW-973-35; ClO_4 + Final Parameters
4														
5														
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12														

F-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 456' Date: 9/29/97

Well Name: MW-14 Sampling Zone No.: SCREEN 4 Starting Time: 0740 Finishing Time: 0900

Technicians: TCHOI/JBROWER/MLOSI

Water Level Inside MP Casing (Beginning of Session) 109.00 psia (End of Session) 108.95 psia

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	109.00	✓	0746	0749	✓	109.02	1	1ST Run; NTUs = 1.73; Ready to Sample
2	✓	✓	✓	✓	✓	✓	108.99	✓	0808	0810	✓	108.99	1	Sample MW-973-36; VOAs, MS/MSD VOAs, metals
3	✓	✓	✓	✓	✓	✓	108.94	✓	0830	0832	✓	108.94	1	Sample MW-973-36; metals MS/MSD; ANIONS; Cr^{+6}; EtO_4
4	✓	✓	✓	✓	✓	✓	108.94	✓	0851	0853	✓	108.95	1	FINAL PARAMETERS
5														
6														
7														
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11														
12														

F-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: _____ Depth: 540 Date: 9-25-97

Well Name: MW-14 Sampling Zone No.: SCREEN 5 Starting Time: 1038 Finishing Time: 1150

Technicians T.CHOI / M.LOSI / J.BRENNER

Water Level Inside MP Casing (Beginning of Session) 145.72 PSIA (End of Session) 145.63 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	145.72	✓	1044	1046	✓	145.69	1.0	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/FORMATION WATER; INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	145.72	✓	1108	1111	✓	145.66	1.0	2ND RUN: SAMPLE MW-973-37; 2 VOAS METALS, ANIONS, Cr^{+6}
3	✓	✓	✓	✓	✓	✓	145.66	✓	1133	1136	✓	145.63	1.0	3RD RUN: SAMPLE MW-973-37; PERCHLOR FINAL PARAMETERS
4														
5														
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10														
11														
12														

F-2

Comments: _____ Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 250 Date: 9-16-97

Well Name: MW-17 Sampling Zone No.: SCREEN 1 Starting Time: 1040 Finishing Time: 1143

Technicians T.CHOI/M.LOSI

Water Level Inside MP Casing (Beginning of Session) 14.14 PSIA (End of Session) 14.16

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.14	✓	1043	1050	✓	14.26	1.0	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/ FORMATION WATER; INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	14.14	✓	1104	1111	✓	14.29	1.0	2ND RUN: SAMPLE MW-973-40: VOAs, METALS, ANIONS,
3	✓	✓	✓	✓	✓	✓	14.16	✓	1025	1132	✓	14.27	1.0	3RD RUN: SAMPLE MW-973-40: Cr(VI), ClO4, FINAL PARAMETERS
4														
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F-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 370 Date: 9-16-97

Well Name: MW-17 Sampling Zone No.: SCREEN 2 Starting Time: 0845 Finishing Time: 1030

Technicians T.CHOI / M.LOSI

Water Level Inside MP Casing (Beginning of Session) 23.65 PSIA (End of Session) 22.99 PSIA

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	23.65	✓	0851	0855	✓	23.66	1.0	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/ FORMATION WATER; INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	23.60	✓	0921	0926	✓	23.59	1.0	2ND RUN: SAMPLE MW-973-41: 2 VOA'S, METALS, MW-973-41MS/MSD 4 VOA'S (1 LOC)
3	✓	✓	✓	✓	✓	✓	23.55	✓	0952	0956	✓	23.55	1.0	3RD RUN: SAMPLE MW-973-41: METALS, ANION CAT (QC), PERCHLOR, ~~FINAL PARAMETERS~~
4	✓	✓	✓	✓	✓	✓	22.98	✓	1018	1021	✓	22.99	0.75	4TH RUN: SAMPLE MW-973-41: PERCHLORATE FINAL PARAMETERS
5														
6														
7														
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11														
12														

F-2

Comments: Total Volume: 3.75

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: _____ Depth: 468 Date: 9-16-97

Well Name: MW-17 Sampling Zone No.: SCREEN 3 Starting Time: 1300 Finishing Time: 1415

Technicians T.CHOI/M.LOSI

Water Level Inside MP Casing (Beginning of Session) 66.33 PSIA (End of Session) 65.57 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	66.33	✓	1314	1317	✓	66.25	1.0	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/ FORMATION WATER; INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	66.16	✓	1338	1342	✓	66.02	1.0	2ND RUN: SAMPLE MW-973-42: ZVOA's, METALS, ANIONS, $^{1}/_{2}Cr^{+6}$
3	✓	✓	✓	✓	✓	✓	65.59	✓	1401	1404	✓	65.57	0.75	3RD RUN; SAMPLE MW-973-42: $^{1}/_{2}Cr^{+6}$, PERCHLORATE, FINAL PARAMETERS
4														
5														
6														
7														
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11														
12														

F-2

Comments: _____ Total Volume: 2.75

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 468 Date: 9/23/97

Well Name: MW-17 Sampling Zone No.: 3 Starting Time: 0810 Finishing Time: 0850

Technicians: T. Blakey, M. Losi, J. Brennan

Water Level Inside MP Casing (Beginning of Session) 63.49 psia (End of Session) 62.50 psia

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	63.49	✓	0819	0821	✓	63.49	1	NTU's = 1.3 Ready to Sample
2	✓	✓	✓	✓	✓	✓	62.50	✓	0839	0841	✓	62.50	0.5	Sample MW-973-00 Lot#6 + Final Parameters.
3														
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7														
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F-2

Comments: * RESAMPLE OF MW-17-3 FOR Cr(VI)

Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 582 Date: 9-15-97

Well Name: MW-17 Sampling Zone No.: SCREEN 4 Starting Time: 1230 Finishing Time: 1402

Technicians T.CHOI/M.LOSI

Water Level Inside MP Casing (Beginning of Session) 107.43 PSIA (End of Session) 107.24 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	107.43	✓	1243	1247	✓	107.37	1.0	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/FORMATION WATER; INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	107.35	✓	1312	1315	✓	107.30	1.0	2ND RUN: SAMPLE MW-97343; 2VOA's, METALS, ANIONS, $^1/_2Cr^{+6}$
3	✓	✓	✓	✓	✓	✓	107.31	✓	1338	1341	✓	107.24	1.0	3RD RUN: PERCHLORATE, FINAL PARAMETERS, $^1/_2Cr^{+6}$
4														
5														
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10														
11														
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F2

Comments: Total Volume: 3.0

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 653 Date: 9-15-97

Well Name: MW-17 Sampling Zone No.: SCREEN 5 Starting Time: 1115 Finishing Time: 1239

Technicians T.CHOI/M.LOST

Water Level Inside MP Casing (Beginning of Session) 170.06 PSIA (End of Session) 169.88 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	170.06	✓	1134	1137	✓	169.99	1.0	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/FORMATION WATER/INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	169.92	✓	1205	1209	✓	169.88	1.0	2ND RUN: ATTEMPTING TO REDUCE TURBIDITY. WILL RETURN LATER.
3	✓													
4														
5														
6														
7														
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9														
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11														
12														

F-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 726 Date: 9-16-97

Well Name: MW-17 Sampling Zone No.: SCREEN 5 Starting Time: 1146 Finishing Time: 1230

Technicians TCH01/MLOS1

Water Level Inside MP Casing (Beginning of Session) 178.37 PSIA (End of Session) 178.27 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	178.37	✓	1211	1215	✓	178.27	1.0	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/ FORMATION WATER; INITIAL PARAMETERS WILL RETURN TO THIS SCREEN LATER
2														
3														
4														
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7														
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12														

F-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 726 Date: 9-17-97

Well Name: MW-17 Sampling Zone No.: SCREEN 5 Starting Time: 0830 Finishing Time: 0945

Technicians T.CHOI/M.LOSI

Water Level Inside MP Casing (Beginning of Session) 178.05 PSIA (End of Session) 178.05PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	178.05	✓	0846	0850	✓	178.05	1.0	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/FORMATION WATER: INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	178.04	✓	0919	0924	✓	178.05	1.0	2ND RUN: ATTEMPTING TO REDUCE TURBIDITY
3														
4														
5														
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7														
8														
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11														
12														

F-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 SCREEN 5 Depth: 726 Date: 9/18/97

Well Name: MW-17 Sampling Zone No.: SCREEN 5 Starting Time: 0830 Finishing Time: 0955

Technicians MLOSI/TCHOI/[illegible]

Water Level Inside MP Casing (Beginning of Session) 175.65 PSIA (End of Session) 175.12 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	175.65	✓	0840	0843	✓	175.67	1.0	1ST PRIOR SAMPLING; RINSE BOTTLES W/ FORMATION WATER; INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	175.65	✓	0911	0914	✓	175.65	1.0	2ND RUN: SAMPLE MW-973-44: 2 VOA's, METALS, ANIONS, Cr^{+6}
3	✓	✓	✓	✓	✓	✓	175.03	✓	0943	0946	✓	175.12	0.75	3RD RUN: SAMPLE MW-973-44; PERCULVR. FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: Total Volume: 2.75

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-18 Depth: 330 Date: 9/23/97

Well Name: MW-18 Sampling Zone No.: 2 Starting Time: 1320 Finishing Time: 1400

Technicians J. Brennen, M. Losi, T. Slaney

Water Level Inside MP Casing (Beginning of Session) 14.06 psia (End of Session) 14.21 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.06	✓	1326	1330	✓	14.23	1	1ST Run; NTUs = 1.43; Ready to Sample
2	✓	✓	✓	✓	✓	✓	14.07	✓	1345	1349	✓	14.24	1	Sample MW-973-46; VOAs, metals, ANIONS, Cr+6
3	✓	✓	✓	✓	✓	✓	1407	✓	1405	1408	✓	14.21	0.75	Sample MW-973-46; ClO_4 + Final Parameters
4														
5														
6														
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11														
12														

F-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-18 Depth: 424 Date: 4/23/97

Well Name: MW-18 Sampling Zone No.: 3 Starting Time: 1210 Finishing Time: 1315

Technicians M. Losi, J. Brenner, T. Blaney

Water Level Inside MP Casing (Beginning of Session) 39.04 psia (End of Session) 38.43*

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	39.04	✓	1217	1221	✓	39.04	1	1315 Run; Screen # 3; NTU's = 2.05;
2	✓	✓	✓	✓	✓	✓	38.92	✓	1240	1243	✓	38.92	1	Sample mw-973-47; VOA's, metals Anions; Cr^{+6}
3	✓	✓	✓	✓	✓	✓	38.43	✓	1300	1303	✓	38.43	0.75	Sample mw-973-47; ClO_4 + Final Parameters
4														
5														
6														
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9														
10														
11														
12														

F-2

Comments: * Only 3 Bottles used on Last Sample Run.

Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-18 Depth: 564 Date: 9/23/97

Well Name: MW-18 Sampling Zone No.: 4 Starting Time: 1048 Finishing Time: 1200

Technicians: T. Bianchi, M. Losi, J. Brenner

Water Level Inside MP Casing (Beginning of Session) 99.94 (End of Session) * 99.38 psia

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	99.94	✓	1101	1104	✓	99.92	1	1ST RUN, INITIAL PARAMETERS, RINSE BOTTLES W/ FORMATION WATER
2	✓	✓	✓	✓	✓	✓	99.92	✓	1126	1129	✓	99.89	1	2ND RUN SAMPLE MW-973-48 VOCs, METALS, ANIONS, Cr(VI)
3	✓	✓	✓	✓	✓	✓	*99.38	✓	1150	1153	✓	*99.39	1	3RD RUN SAMPLE MW-973-48; ClO_4, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: * ONLY 3 BOTTLES SENT DOWN

Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-18 Depth: 684 Date: 9/23/97

Well Name: MW-18 Sampling Zone No.: 5 Starting Time: 0920 Finishing Time: 1045

Technicians T. BLANEY, M. Losi, S. Brenner

Water Level Inside MP Casing (Beginning of Session) 152.18 psia (End of Session) 152.10 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	152.18	✓	0931	0933	✓	152.18	1	1st Run; NTU's = 1.65; Ready to Sample
2	✓	✓	✓	✓	✓	✓	152.06	✓	0957	0959	✓	152.06	1	Sample MW-973-49; VOAs, metals ANIONS + [redacted] + MS/MSD
3	✓	✓	✓	✓	✓	✓	152.12	✓	1025	1028	✓	152.10	1	Sample MW-973-49; ClO_4 + Cr+6 Final Parameters
4														
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6														
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≈ 167.02

F-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 242 Date: 9-19-97

Well Name: MW-19 Sampling Zone No.: SCREEN 1 Starting Time: 0830 Finishing Time: 0937

Technicians T.CHOI/M.LUSI

Water Level Inside MP Casing (Beginning of Session) 14.17 PSIA (End of Session) 14.22 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.17	✓	0844	0850	✓	14.18	1.0	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/FORMATION WATER; INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	14.14	✓	0906	0911	✓	14.23	1.0	2ND RUN: SAMPLE MW-973-50: VOAS METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	14.14	✓	0923	0928	✓	14.22	1.0	3RD RUN: SAMPLE MW-973-50: Cr^{+6} PERCHLOR. FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments:

Total Volume: 3.0

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 314 Date: 9-19-97

Well Name: MW-19 Sampling Zone No.: SCREEN 2 Starting Time: 0940 Finishing Time: 1310

Technicians T.CHOI/M.LOSI

Water Level Inside MP Casing (Beginning of Session) 14.16 PSIA (End of Session) 14.30 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.16	✓	0945	0949	✓	14.23	1.0	1ST RUN PRIOR SAMPLING; RINSE BOTTLES W/ FORMATION WATER; INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	14.19	✓	1006	1012	✓	14.22	1.0	2ND RUN: ATTEMPTING TO REDUCE TURBIDITY
3	✓	✓	✓	✓	✓	✓	14.18	✓	1028	1032	✓	14.23	1.0	3RD RUN; ATTEMPTING TO REDUCE TURBIDITY
4	✓	✓	✓	✓	✓	✓	14.17	✓	1048	1053	✓	14.25	1.0	4TH RUN; ATTEMPTING TO REDUCE TURBIDITY
5	✓	✓	✓	✓	✓	✓	14.20	✓	1111	1116	✓	14.25	1.0	5TH RUN: ATTEMPTING TO REDUCE TURBIDITY
6	✓	✓	✓	✓	✓	✓	14.20	✓	1132	1136	✓	14.28	1.0	6TH RUN: ATTEMPTING TO REDUCE TURBIDITY
7	✓	✓	✓	✓	✓	✓	14.23	✓	1153	1200	✓	14.30	1.0	7TH RUN: ATTEMPTING TO REDUCE TURBIDITY
8	✓	✓	✓	✓	✓	✓	14.22	✓	1301	1305	✓	14.30	1.0	8TH RUN: ATTEMPTING TO REDUCE TURBIDITY
9														
10														
11														
12														

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Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: _____ Depth: 314 Date: 9-22-97

Well Name: MW-19 Sampling Zone No.: SCREEN 2 Starting Time: 0815 Finishing Time: 0940

Technicians: T.CHOI / J.BRENNER / M.LOSI

Water Level Inside MP Casing (Beginning of Session) 16.27 PSIA (End of Session) 15.18 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	16.27	✓	0820	0824	✓	16.27	1.0	1ST RUN PRIOR SAMPLING; INITIAL PARAMETERS (RINSE BOTTLES W/ FORMATION H2O)
2	✓	✓	✓	✓	✓	✓	16.29	✓	0847	0852	✓	16.27	1.0	2ND RUN: SAMPLE MW-973-51: 2 VOA's, METALS (1L)
3	✓	✓	✓	✓	✓	✓	16.23	✓	0907	0912	✓	16.28	1.0	3RD RUN: SAMPLE MW-973-51: ANIONS; Cr^{+6}, PERCHLORATE
4	✓	✓	✓	✓	✓	✓	15.17	✓	0927	0931	✓	15.18	0.5	4TH RUN: FINAL PARAMETERS
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: _____ Total Volume: 3.5

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 392 Date: 9-18-97

Well Name: MW-19 Sampling Zone No.: SCREEN 3 Starting Time: 1320 Finishing Time: 1430

Technicians T.CHOI / M.LOSI / G.SHAW

Water Level Inside MP Casing (Beginning of Session) 14.21 PSIA (End of Session) 14.30 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.21	✓	1324	1329	✓	14.24	1.0	1ST RUN PRIOR SAMPLING; RINSE BOTTLES W/FORMATION WATER; INITIAL PARAMETER
2	✓	✓	✓	✓	✓	✓	14.26	✓	1352	1357	✓	14.26	1.0	2ND RUN; ATTEMPTING TO REDUCE TURBIDITY
3	✓	✓	✓	✓	✓	✓	14.19	✓	1415	1419	✓	14.30	1.0	3RD RUN; ATTEMPTING TO REDUCE TURBIDITY
4														
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6														
7														
8														
9														
10														
11														
12														

F-2

Comments: Total Volume: 3.0

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 392 Date: 9-19-97

Well Name: MW-19 Sampling Zone No.: SCREEN 3 Starting Time: 1405 Finishing Time: 1515

Technicians T. CHOI / M. LOSI / T. BLANEY

Water Level Inside MP Casing (Beginning of Session) 22.25 PSIA (End of Session) 22.28 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	22.25	✓	1414	1418	✓	22.32	1.0	1ST RUN PRIOR SAMPLING: INITIAL PARAMETERS RINSE BOTTLES W/FORMATION WATER
2	✓	✓	✓	✓	✓	✓	22.25	✓	1434	1438	✓	22.32	1.0	2ND RUN; SAMPLE MW-973-52; VOA's, METALS, ANIONS; VOA's MS/MSD
3	✓	✓	✓	✓	✓	✓	22.30	✓	1456	1502	✓	22.28	1.0	3RD RUN; SAMPLE MW-973-52; Cr^{+6}, PERCHLORATE, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 444 Date: 9-18-97

Well Name: MW-19 Sampling Zone No.: SCREEN 4 Starting Time: 1138 Finishing Time: 1315

Technicians T. CHOI / M. LOSI / G. SHAW

Water Level Inside MP Casing (Beginning of Session) 28.30 PSIA (End of Session) 27.77 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	28.30	✓	1144	1149	~~28.28~~ ✓	28.28	1.0	1ST RUN PRIOR SAMPLING; RINSE BOTTLES W/FORMATION WATER; INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	28.32	✓	1209	1214	✓	28.30	1.0	2ND RUN: ATTEMPTING TO REDUCE TURBIDITY
3	✓	✓	✓	✓	✓	✓	28.27	✓	1234	1239	✓	28.27	1.0	3RD RUN: SAMPLE MW-973-53; VOA's, METALS, ANIONS,
4	✓	✓	✓	✓	✓	✓	27.75	✓	1300	1303	✓	27.77	0.7	4TH RUN: SAMPLE MW-973-53: Cr^{+6}, PERCHLORATE, FINAL PARAMETERS
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: Total Volume: 3.75

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 498 Date: 9-18-97

Well Name: MW-19 Sampling Zone No.: SCREEN 5 Starting Time: 1020 Finishing Time: 1140

Technicians T.CHOI/M.LOSI/G.SHAW

Water Level Inside MP Casing (Beginning of Session) 51.91 PSIA (End of Session) 1135

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	51.91	✓	1028	1033	✓	51.88	1.0	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/ FORMATION WATER: INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	51.87	✓	1054	1057	✓	51.84	1.0	2nd RUN: SAMPLE MW-973-54: 2 VOAS, METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	51.86	✓	1120	1123	✓	51.84	1.0	3RD RUN: SAMPLE MW-973-54: CL-06, PERCHLORATE, FINAL PARAMETERS
4														
5														
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7														
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9														
10														
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12														

F-2

Comments: Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-20 Depth: 230 Date: 9/23/97

Well Name: MW-20 Sampling Zone No.: 1 Starting Time: 0745 Finishing Time: 0800

Technicians T. BLANEY, J. BRENNAN, M. LOSI

Water Level Inside MP Casing (Beginning of Session) 14.06 (End of Session) 14.06

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.06	✓					~~0~~	NO WATER over Screen
2														#1. Cannot Collect
3														Sample
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 392 Date: 9/22/97

Well Name: MW-20 Sampling Zone No.: SCREEN 2 Starting Time: 1459 Finishing Time: 1600

Technicians: NLOSI/TCHOI/TBLANEY/JBRENCE

Water Level Inside MP Casing (Beginning of Session) 48.92 (End of Session) 48.34 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	48.92	✓	1505	1508	✓	48.92	1	1ST RUN PRIOR TO SAMPLING: INITIAL PARAMS, RINSE BOTTLES W/ FORM. WATER
2	✓	✓	✓	✓	✓	✓	48.95	✓	1524	1527	✓	48.90	1	2ND RUN, SAMPLE MW-473-56: VOAs, METALS, ANIONS, Cr(VI)
3	✓	✓	✓	✓	✓	✓	48.34	✓	1544	1546	✓	48.34	1	3RD RUN, SAMPLE MW-473-56: ClO4, FINAL PARAMETERS
4														
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11														
12														

F-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 562 Date: 9/22/97

Well Name: MW-20 Sampling Zone No.: SCREEN 3 Starting Time: 1345 Finishing Time: 1457

Technicians MLOSI/TCHOI/TBLANEY/JBROWER

Water Level Inside MP Casing (Beginning of Session) 122.89 (End of Session) * 122.25

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	122.89	✓	1355	1358	✓	122.90	1.0	1ST RUN PRIOR TO SAMPLING: INITIAL PARAMETERS, RINSE BOTTLES W/ FORM. H2O
2	✓	✓	✓	✓	✓	✓	122.87	✓	1418	1421	✓	122.89	1.0	2ND RUN: SAMPLE MW-973-57, VOCS, METALS, ANIONS, Cr (VI)
3	✓	✓	✓	✓	✓	✓	* 122.25	✓	1443	1446	✓	* 122.25	1.0	3RD RUN: SAMPLE MW-973-57: ClO_4; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: * ONLY 3 SAMPLE BOTTLES SENT DOWN

Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 700 Date: 9/22/97

Well Name: MW-20 Sampling Zone No.: SCREEN 4 Starting Time: 1150 Finishing Time: 1340

Technicians MLOSI/TOYOI/TBARNEY/JBRENNER

Water Level Inside MP Casing (Beginning of Session) 182.99 (End of Session) 182.44*

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	182.99	✓	1200	1203	✓	182.98	1.0	1ST RUN PRIOR TO SAMPLING: IN SITU PARAMETERS, RINSE BOTTLES W/FORM. H2O
2	✓	✓	✓	✓	✓	✓	183.00	✓	1231	1233	✓	182.97	1.0	2ND RUN: SAMPLE MW-973-58 2 VOCS, METALS, ANIONS, Cr(VI)
3	✓	✓	✓	✓	✓	✓	*182.45	✓	1327	1329	✓	*182.44	1.0	3RD RUN: SAMPLE MW-973-58 ClO_4, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: * ONLY 3 SAMPLE BOTTLES SENT DOWN Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 900 Date: 9/22/97

Well Name: MW-20 Sampling Zone No.: SCREEN 5 Starting Time: 1003 Finishing Time: 1145

Technicians MLOSI / TCHOI / TBLANEY / JBRENNER

Water Level Inside MP Casing (Beginning of Session) 270.01 (End of Session) 269.99

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	270.01	✓	1017	1020	✓	270.02	1.0	1ST RUN PRIOR TO SAMPLING: INITIAL PARAMETERS, RINSE BOTTLES W/FORM. H2O
2	✓	✓	✓	✓	✓	✓	270.04	✓	1052	1054	✓	270.01	1.0	2ND RUN: SAMPLE MW-973-54: VOCs, METALS, ANIONS, Cr(VI), ½ ClO_4
3	✓	✓	✓	✓	✓	✓	270.00	✓	1128	1130	✓	269.99	1.0	3RD RUN: SAMPLE MW-973-59: ½ ClO_4, FINAL PARAMETERS
4														
5														
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9														
10														
11														
12														

F-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: _____ Depth: 90 Date: 9/29/97

Well Name: MW-21 Sampling Zone No.: SCREEN 1 Starting Time: _____ Finishing Time: _____

Technicians T. BLANEY, M. LOSI, T. CHOI, J. BRENNER

Water Level Inside MP Casing (Beginning of Session) 14.10 PSIA (End of Session) _____

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.10	✓					0	NO WATER OVER SCREEN
2														#1, CANNOT COLLECT
3														SAMPLE
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: _____ Total Volume: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 161 Date: 9-29-97

Well Name: MW-21 Sampling Zone No.: 2 Starting Time: 1412 Finishing Time: 1500

Technicians T. BLANEY, M. LOSI, T. CHOI, J. BRENNER

Water Level Inside MP Casing (Beginning of Session) 25.65 PSIA (End of Session) 25.14 PSIA

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	25.65	✓	1415	1422	✓	25.65	1	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/FORMATION WATER
2	✓	✓	✓	✓	✓	✓	25.64	✓	1432	1435	✓	25.67	1	2ND RUN: SAMPLE MW-973-61 VOA's, metals, AN. ions, or-te, ns/sd
3	✓	✓	✓	✓	✓	✓	25.14	✓	1448	1451	✓	25.14	1	SAMPLE MW-973-61 CLO4 + Final Parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 240 Date: 9-29-97

Well Name: MW-21 Sampling Zone No.: 3 Starting Time: 1242 Finishing Time: 1405

Technicians T. BLANEY, M. LOSI, T. CHOI, J. BRENNER

Water Level Inside MP Casing (Beginning of Session) 60.22 PSIA (End of Session) 60.12

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	60.22	✓	1249	1252	✓	60.21	1	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/ FORMATION WATER; INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	60.24	✓	1305	1308	✓	60.19	1	2ND RUN: ATTEMPTING TO REDUCE TURBIDITY: NTU's = ~~10.02~~ 10.46
3	✓	✓	✓	✓	✓	✓	60.20	✓	1321	1324	✓	60.18	1	3RD RUN: ATTEMPTING TO REDUCE TURBIDITY: NTU's = ~~10.46~~ 6.87
4	✓	✓	✓	✓	✓	✓	60.15	✓	1338	1342	✓	60.16	1	4TH RUN: ATTEMPTING TO REDUCE TURBIDITY: NTU's = 17.20
5	✓	✓	✓	✓	✓	✓	60.13	✓	1356	1400	✓	60.12	1	5TH RUN: ATTEMPTING TO REDUCE TURBIDITY NTU's =
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: _____ Depth: 240 Date: 10/1/97

Well Name: MW-21 Sampling Zone No.: SCREEN 3 Starting Time: 0932 Finishing Time: 1018

Technicians T. BLANEY, T. CHOI, M. LOSI

Water Level Inside MP Casing (Beginning of Session) 67.61 psia (End of Session) 67.58 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	67.61	✓	0936	0939	~~67.61~~ ✓	67.61	1	1st Purge; NTUs = 3.16; Ready to Sample
2	✓	✓	✓	✓	✓	✓	67.58	✓	0951	0954	✓	67.60	1	Sample MW-973-62; VOAs, metals, ANIONS, Cr^{+6}.
3	✓	✓	✓	✓	✓	✓	67.57	✓	1008	1011	✓	67.58	1	Sample MW-973-62; ClO_4 + Final Parameters
4														
5														
6														
7														
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9														
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11														
12														

F-2

Comments: _____ Total Volume: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 310 Date: 9/29/97

Well Name: MW-21 Sampling Zone No.: 4 Starting Time: 1130 Finishing Time: 12:45

Technicians T. Blaney, M. Losi, T. Cesi, J. Brennan

Water Level Inside MP Casing (Beginning of Session) 90.37 PSIA (End of Session) 89.25 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	90.37	✓	1136	1140	✓	90.35	1	1ST RUN PRIOR SAMPLING; RINSE BOTTLES W/FORMATION WATER: INITIAL PARAMETER
2	✓	✓	✓	✓	✓	✓	90.34	✓	1156	1159	✓	90.33	1	2ND Run; NTU's = 4.51; Sample MW-973-63; VOA's + ½ metals
3	✓	✓	✓	✓	✓	✓	90.34	✓	1219	1221	✓	90.34	1	Sample MW-973-63: ½ metals Anions + Cr^{+6} + ClO_4
4	✓	✓	✓	✓	✓	✓	89.30	✓	1232	1236	✓	89.25	0.5	Final Parameters
5														
6														
7														
8														
9														
10														
11														
12														

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Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 372 Date: 9/29/97

Well Name: MW-21 Sampling Zone No.: 5 Starting Time: 0945 Finishing Time: 1130

Technicians T. Blaney, M. Losi, T. Choi, J. Brennan

Water Level Inside MP Casing (Beginning of Session) 117.53 psia (End of Session) 117.38

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	117.53	✓	0951	0953	✓	117.53	1	1ST RUN; NTU's = 231; Reducing Turbidity
2	✓	✓	✓	✓	✓	✓	117.42	✓	1000	1012	✓	117.43	1	2ND RUN; NTU's = 17.1; Reducing Turbidity
3	✓	✓	✓	✓	✓	✓	117.39	✓	1029	1031	✓	117.40	1	3RD Run; NTU's = 17.3; Reducing Turbidity
4	✓	✓	✓	✓	✓	✓	117.38	✓	1116	1119	✓	117.38	1	4TH RUN; NTU's = 50 Reducing Turbidity
5														
6														
7														
8														
9														
10														
11														
12														

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Comments: Total Volume:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 372 Date: 9-30-97

Well Name: MW-21 Sampling Zone No.: SCREEN 5 Starting Time: 1054 Finishing Time: 1425

Technicians T. BLANEY, T. CHOI, M. COSI

Water Level Inside MP Casing (Beginning of Session) 72.89 (End of Session) 120.69 *

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	72.89	✓	1103	1105	✓	72.88	1	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/FORMATION WATER; INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	120.75	✓	1333	1336	✓	120.75	1	2ND Run; Parameters after purge. NTU's = 12.19;
3	✓	✓	✓	✓	✓	✓	120.75	✓	1353	1356	✓	120.75	1	Sample MW-973-64; VOAs, metals, anions, etc
4	✓	✓	✓	✓	✓	✓	120.69	✓	1412	1415	✓	120.69	1	Sample MW-973-64; ClO_4 + Final Parameters
5														
6														
7														
8														
9														
10														
11														
12														

F2

Comments: * Purged 3 Packer Volumes. Reason For Increase in Water Pressure. Total Volume:

Continue

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: Depth: 245 Date: 10/14/97

Well Name: MW-22 Sampling Zone No.: SCREEN 1 Starting Time: 1240 Finishing Time: 1438

Technicians: T. BLANEY/T. CHOI

Water Level Inside MP Casing (Beginning of Session) 14.16 psia (End of Session) 14.23 PSIA

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	14.16	✓	1248	1253	✓	14.25	1.0	1ST RUN PRIOR SAMPLING: RINSE BOTTLES W/ FORMATION WATER: INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	14.14	✓	1307	1313	✓	14.25	1.0	2ND RUN: ATTEMPTING TO REDUCE TURBIDITY NTU's = 38.5
3	✓	✓	✓	✓	✓	✓	14.14	✓	1324	1329	✓	14.24	1.0	3RD RUN: ATTEMPTING TO REDUCE TURBIDITY NTU's = 37.9
4	✓	✓	✓	✓	✓	✓	14.17	✓	1342	1348	✓	14.24	1.0	4TH RUN: ATTEMPTING TO REDUCE TURBIDITY NTU's = 38.3
5	✓	✓	✓	✓	✓	✓	14.16	✓	1401	1408	✓	14.25	1.0	5TH RUN: ATTEMPTING TO REDUCE TURBIDITY NTU's = 36.2
6	✓	✓	✓	✓	✓	✓	14.13	✓	1423	1429	✓	14.23	1.0	6TH RUN: ATTEMPTING TO REDUCE TURBIDITY NTU's = 41.5
7														
8														
9														
10														
11														
12														

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Comments:

Total Volume: 6.02