REPORT

QUARTERLY GROUNDWATER MONITORING RESULTS, JULY-AUGUST 1998

at the:

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF FIGURES

(Continued)

EXECUTIVE SUMMARY

Presented in this report are the results of the eighth quarterly groundwater sampling event (July-August 1998) completed as part of a long-term quarterly groundwater monitoring program at the NASA-Jet Propulsion Laboratory (JPL). The long-term quarterly monitoring program was initiated in 1996 in response to a request from the United States Environmental Protection Agency (EPA). The program began during the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Remedial Investigation for on-site and off-site groundwater at JPL.

From July 17 to August 13, 1998, 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. Analyses for 1,4-dioxane and n-nitroso-dimethylamine (NDMA) were performed on six samples collected from selected wells/screens to determine whether or not these chemicals are present in the groundwater beneath JPL.

Results indicated that only four VOCs (carbon tetrachloride, trichloroethene, tetrachloroethene and 1,2-dichloroethane) were detected in 12 wells (9 on-site and 3 off-site) at concentrations above state or Federal Maximum Contaminant Levels (MCLs) for drinking water. Perchlorate was detected in six wells at concentrations exceeding the state Interim Action Level (IAL) of 18 µg/L. Hexavalent chromium was found in one well. To date, an MCL has not been established for hexavalent chromium. Arsenic was not detected at concentrations above its MCL and total chromium was detected in only one well at a concentration exceeding its MCL. Lead was also detected in one well at a concentration exceeding its MCL. A summary of the sampling procedures 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 eighth groundwater sampling event completed as part of a long-term quarterly 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. From July 17 to August 13, 1998, Foster Wheeler Environmental Corporation (Foster Wheeler) personnel collected samples from all JPL monitoring wells (both on- and off-site). In addition, the water-level elevation at each well was measured prior to (July 15, 1998), and after (August 17, 1998) sampling to evaluate groundwater flow directions and gradients.

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 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 was not sampled since it was 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.

All of the JPL groundwater samples were taken to Montgomery Watson Laboratories in Pasadena, California, for chemical analysis. Samples collected for n-nitroso-dimethylamine (NDMA) analysis were shipped to Pacific Laboratories via Montgomery Watson Laboratories. Montgomery Watson Laboratories and Pacific Laboratories are certified by the California Department of Health Services. The following analyses were performed on the samples collected at JPL:

Analysis	Well (Screen)	EPA Method
Volatile Organic Compounds (VOCs)	All	524.2
Total Chromium (Cr)	All	200.8
Hexavalent Chromium [Cr(VI)]	All	7196
Total Lead (Pb)	All	200.8
Total Arsenic (As)	All	200.9
Major Cations and Major Anions	All	Various
Perchlorate (ClO_4^-)	All	300.0, modified
1,4-Dioxane	MW-4(2), MW-7, MW-13, MW-16, MW-17(3), MW-24(1)	8270
NDMA	MW-4(2), MW-7, MW-13, MW-16, MW-17(3), MW-24(1)	1625C

In addition to groundwater samples, field quality assurance/quality control (QA/QC) samples, including trip blanks, equipment blanks, duplicate samples, and a field blank 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 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 shallow JPL monitoring wells, which includes monitoring wells MW-1, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-13, MW-15, and MW-16.

The primary equipment used to sample the shallow wells included dedicated 2-inch Grundfos Redi-Flo2® pumps, 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 the 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 shallow well casing was purged (by pumping) to remove groundwater that may have been exposed to the atmosphere and thus may not be 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 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 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 thereafter. Samples collected for VOCs had zero headspace.

Calibration, or standardization, of the field instruments used to measure temperature, pH, electrical 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 multi-port monitoring wells at JPL 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-collection bottles were decontaminated prior to sampling each screened interval in the deep multi-port wells according to the following procedures:

- Wash each 250-mL stainless-steel sample-collection 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 American Society of Testing Materials (ASTM) Type II organic free water.
- Rinse each bottle with ASTM Type II 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 ASTM Type II water solution through them. A final rinse with ASTM Type II 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 multi-port monitoring wells because the groundwater sample is collected directly from the aquifer, thus ensuring that the groundwater sample has not been exposed to the atmosphere. However, at each screened interval an initial sample was collected in order to check temperature, pH, conductivity, and turbidity in the field, and to rinse the Westbay stainless-steel sample-collection bottles with formation water. Samples for laboratory analysis were then collected and transferred to sample containers as described in Section 2.1. A final sample was then collected and the temperature, pH, conductivity, and turbidity were measured 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 of field instruments was 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, trip blanks, and a field blank. 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 multi-port monitoring wells MW-4 (Screen 2) and MW-12 (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 use in verifying the accuracy of the analytical method. Similarly, after every 10 samples that were collected for metals analyses, an MS/MSD sample was collected and submitted to the laboratory for analytical method verification. MS/MSD samples for 1,4-dioxane and NDMA were also submitted.

One equipment blank was collected from the Westbay sample bottles during each day of sampling of the deep multi-port wells. Equipment blanks consisted of ASTM Type II organic free water (provided by the laboratory) which had been passed through the sampling equipment after the equipment had been decontaminated. Equipment blanks were analyzed for the same constituents (except cations and anions) 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.

During this sampling event, one field blank was collected at monitoring well MW-7. The field blank is used to determine whether ambient conditions or sample containers may effect analytical results. The field blank consisted of sample bottles, filled with ASTM Type II organic-free water supplied by the laboratory, left open at the well head during the sampling of the well. After sampling, the bottles containing the field blank were capped and analyzed for the same constituents as the groundwater samples, except for cations and anions, which are used solely for the purpose of identifying water types beneath and adjacent to the JPL site.

3.0 ANALYTICAL RESULTS

JPL groundwater monitoring wells MW-1, and MW-3 through MW-24 were sampled from July 17 to August 13, 1998. Monitoring well MW-2 was not sampled as it was replaced as a JPL monitoring point by deep multi-port monitoring well MW-14.

The groundwater samples collected during this sampling event were analyzed for volatile organic compounds (VOCs), total chromium (Cr), hexavalent chromium [Cr(VI)], total lead (Pb), total arsenic (As), and perchlorate (ClO_4^-). Samples collected from selected wells/screens were also analyzed for 1,4-dioxane and n-nitroso-dimethylamine (NDMA). In addition, all samples were 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), electrical 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 July-August 1998 sampling event were analyzed for over 60 different VOCs in accordance with EPA Method 524.2. To present the results on concentration contour maps, the JPL aquifer was divided into four aquifer layers based primarily 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 July-August 1998 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 the JPL samples, and only four VOCs [carbon tetrachloride (CCl_4), trichloroethene (TCE), tetrachloroethene (PCE), 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, PCE, and 1,2-DCA detected in each aquifer layer are contoured on site maps to show the spatial distribution of each constituent. For instances where a constituent was not detected in a particular aquifer layer, a contour map was not prepared for that constituent in that particular layer. Carbon tetrachloride concentrations 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 display 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 show contours of PCE

detected in aquifer layers 1, 2 and 3. A summary of the VOC results compiled from all eight 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 nine on-site wells at JPL, and one JPL off-site well (Table 3-3, Figures 3-1, 3-2 and 3-3). The Federal MCL (5.0 µg/L) was exceeded in five on-site wells. The highest concentrations of CCl_4 were found in on-site wells MW-7, MW-12 (Screen 3), MW-16 and MW-24 (Screen 2).

TCE concentrations exceeded the state and Federal MCL (5.0 µg/L) in four on-site wells, and two off-site wells (Table 3-3, Figures 3-4, 3-5, and 3-6). The highest levels of TCE were found in on-site wells MW-7, MW-13 , and MW-16 and off-site well MW-21 (Screen 1).

1,2-DCA was detected in two on-site wells (MW-7 and MW-16). The detection limit and the state MCL (0.5 µg/L) for 1,2-DCA are the same (Table 3-3 and Figure 3-7). 1,2-DCA was not detected in any off-site well. The Federal MCL for 1,2-DCA (5.0 µg/L) was not exceeded in any well.

PCE was detected at low levels in several on-site and off-site wells (Figures 3-8, 3-9 and 3-10). The state and Federal MCL (5.0 µg/L) was exceeded only in off-site upgradient well MW-21 (Screen 5).

3.2 PERCHLORATE RESULTS

Perchlorate analyses were conducted on groundwater samples from the July-August 1998 event using ion chromatography (EPA 300.0, modified). Results are included in Table 3-3. No MCLs for ClO_4^- have been established to date, however, the California Department of Health Services has established an Interim Action Level (IAL) of 18 µg/L for ClO_4^-. Perchlorate was detected in a total of 16 wells (Table 3-3). Samples from six of the 16 wells exceeded the Interim Action Level (18 µg/L). Perchlorate concentrations are contoured in Figures 3-11, 3-12 and 3-13 for aquifer layers 1, 2 and 3, respectively. The highest ClO_4^- levels were observed on-site in wells MW-7, MW-13, MW-16, and MW-24 (Screen 2).

3.3 METALS RESULTS

Groundwater samples were analyzed for the following suite of metals: total As, total Pb, total Cr, and Cr(VI). The results of these analyses are summarized below and in Table 3-5.

Total As was detected at levels well below its MCL in 2 wells during the July-August 1998 event. Total Pb was detected at levels well below its state MCL (0.050 mg/L) and the Federal Action Level (0.15 mg/L) in wells MW-1, MW-3 (Screen 2), MW-4 (Screen 4), MW-12 (Screens 2 and 3), MW-17 (Screen 2), and MW-19 (Screen 5). Concentrations of Pb ranged from

0.003 to 0.018 mg/L. Total Cr was detected in five wells [MW-1, MW-4 (Screen 2), MW-6, MW-13, and MW-18 (Screen 3)] at concentrations below Federal drinking water standards (0.10 mg/L). However, total Cr was detected slightly above the state MCL (0.05 mg/L) in MW-1 (0.055 mg/L). Hexavalent chromium was only detected in on-site shallow well MW-13. At this time, neither state nor Federal agencies have established an MCL for Cr(VI).

Table 3-6 contains a summary of metals data from all eight quarterly sampling events completed to date during the long-term monitoring program.

3.4 1,4-DIOXANE AND NDMA RESULTS

Groundwater samples were collected from six locations [MW-4 (Screen 2), MW-7, MW-13, MW-16, MW-17 (Screen 3), and MW-24 (Screen 1)] during the July-August 1998 sampling event and analyzed for 1,4-dioxane and NDMA as a screen for the presence of these chemicals in the groundwater beneath JPL. Samples from these six wells have historically contained the highest concentrations of VOCs at JPL. 1,4-Dioxane was analyzed using EPA Method 8270 and NDMA was analyzed using EPA Method 1625C. At this time, state or Federal MCLs have not been established for either of these compounds. The method detection limits for 1,4-dioxane and NDMA are 3.0 µg/L and 0.03 µg/L, respectively. 1,4-Dioxane and NDMA were not detected in any of the six samples collected.

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 July-August 1998 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 with respect to the JPL groundwater matrix, 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, trip blanks and a field blank.

Duplicate samples were used to evaluate the precision of the laboratory analyses. Duplicate groundwater samples were collected from MW-4 (Screen 2), MW-10, MW-12 (Screen 2), and MW-13 and analyzed for VOCs, ClO_4^- and metals. 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).

Sixteen equipment blanks and nineteen trip blanks were submitted for analysis during the July-August 1998 sampling event. One VOC, dichloromethane (a known laboratory contaminant), was

detected in two trip blanks and one equipment blank. Six unknown organic compounds, identified only by retention time, were detected in five of the equipment blanks. Only one of the six unknown organic compounds was detected in its associated groundwater sample. This data indicates that contamination of JPL groundwater samples due to improper decontamination or during travel is very unlikely.

There were no VOCs, ClO_4^- or metals detected in the field blank, indicating no influence of ambient conditions on groundwater analytical results.

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 and adjacent to JPL. Samples from each of the JPL shallow monitoring wells and each of the deep multi-port 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 total dissolved solids (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 July-August 1998 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 three 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.

In addition to the general water types described above, the analytical data suggest that these water types mix, or blend with one another, creating "intermediate" water types. For example, water Types 1 and 2 can mix to create a 1+2 or a 2+1 type, where the first number indicates the general water type that is predominant in the mixture. The Stiff diagrams presented in Figures 4-1 through 4-3 contain graphical representations of these "intermediate" water types.

Water Type 1, the calcium-bicarbonate water type, was the most common water type at JPL during the July-August 1998 sampling event. In general, it was found at relatively shallow depths in wells located around the Arroyo Seco. Water Type 2, the sodium-bicarbonate water type (including associated blends), was typically found in the deeper well screens of both the on-site and off-site multi-port wells. Type 3 groundwater, the calcium-bicarbonate/chloride/ sulfate/nitrate water type, was prevalent in the shallower screens of the monitoring wells located around the perimeter of the JPL facility, including "downgradient" and "upgradient" off-site

wells. A list of water types and JPL monitoring wells in which they occur is provided in Table 4-2.

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 July-August 1998 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 July-August 1998 water-chemistry results are presented in Table 4-3. 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 July-August 1998 sampling event are within the ideal range ($\pm$5 percent) for 44 of the 75 sets of water chemistry results. The charge balance for the remaining sets of water chemistry analyses were slightly above 5 percent (Table 4-3), 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 July-August 1998 water-chemistry results fell within the ideal range (1.0 to 1.2) for 67 of the 75 sets of water chemistry analyses performed (Table 4-3). The ratio for the remaining nine sets of water chemistry data fell slightly outside this ideal range suggesting minor analytical errors or 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 July 15, 1998, and after sampling on August 17, 1998, to evaluate groundwater flow directions and gradients beneath and adjacent to JPL. 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 multi-port wells, the hydraulic 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 provided in Table 5-2 and have been contoured in Figure 5-2. The hydraulic heads measured at each deep multi-port well screen before and after sampling are presented graphically in Figures 5-3 and 5-4, respectively. The pressure-profile records for the deep wells are included in Appendix B.

As indicated by Figures 5-1 and 5-2, groundwater flow was primarily to the south and east both before and after sampling. It is apparent that mounding has occurred along the eastern edge of the facility due to continuous runoff from heavy winter rains and subsequent aquifer recharge in the Arroyo Seco. This mounding has led to a localized change of flow in the westerly direction along the eastern portion of JPL. The "trough" of depression observed around the City of Pasadena municipal production wells (Figure 5-1 and 5-2) is the result of active pumping by several of these wells throughout this sampling event. This is also indicated by data shown in Figures 5-3 and 5-4 where the effects of municipal well pumping are reflected by relatively large drawdowns in the hydraulic heads measured at the lowermost screens within the multi-port wells closest to the production wells (MW-3, -4, -11, -12, -17 and -19).

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-Port	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
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

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-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
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

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-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, JULY-AUGUST 1998

Sample Location	Sample Number	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	1,4-Dioxane EPA 8270	NDMA EPA 1625C
MW-1	MW-983-079	GW	X	X	X	X	X		
MW-3									
Screen 1	MW-983-078	GW	X	X	X	X	X		
Screen 2	MW-983-077	GW	X	X	X	X	X		
Screen 3	MW-983-076	GW	X	X	X	X	X		
Screen 4	MW-983-075	GW	X	X	X	X	X		
Screen 5	MW-983-074	GW	X	X	X	X	X		
MW-4									
Screen 1	MW-983-073	GW	X	X	X	X	X		
Screen 2	MW-983-072	GW	X	X	X	X	X	X	X
Screen 2	MW-983-071	DUP	X	X (no cations)	X		X		
Screen 3	MW-983-070	GW	X	X	X	X	X		
Screen 4	MW-983-069	GW	X	X	X	X	X		
Screen 5	MW-983-068	GW	X	X	X	X	X		
MW-5	MW-983-067	GW	X	X	X	X	X		
MW-6	MW-983-066	GW	X	X	X	X	X		
MW-7	MW-983-065	GW	X	X	X	X	X	X	X
MW-8	MW-983-064	GW	X	X	X	X	X		
MW-9	MW-983-063	GW	X	X	X	X	X		
MW-10	MW-983-062	GW	X	X	X	X	X		
MW-10	MW-983-061	DUP	X	X (no cations)	X		X		
MW-11									
Screen 1	MW-983-060	GW	X	X	X	X	X		
Screen 2	MW-983-059	GW	X	X	X	X	X		
Screen 3	MW-983-058	GW	X	X	X	X	X		
Screen 4	MW-983-057	GW	X	X	X	X	X		
Screen 5	MW-983-056	GW	X	X	X	X	X		

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, JULY-AUGUST 1998

Sample Location	Sample Number	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	1,4-Dioxane EPA 8270	NDMA EPA 1625C
MW-12									
Screen 1	MW-983-055	GW	X	X	X	X	X		
Screen 2	MW-983-054	GW	X	X	X	X	X		
Screen 2	MW-983-053	DUP	X	X (no cations)	X		X		
Screen 3	MW-983-052	GW	X	X	X	X	X		
Screen 4	MW-983-051	GW	X	X	X	X	X		
Screen 5	MW-983-050	GW	X	X	X	X	X		
MW-13	MW-983-049	GW	X	X	X	X	X	X	X
MW-13	MW-983-048	DUP	X	X (no cations)	X		X		
MW-14									
Screen 1	MW-983-047	GW	X	X	X	X	X		
Screen 2	MW-983-046	GW	X	X	X	X	X		
Screen 3	MW-983-045	GW	X	X	X	X	X		
Screen 4	MW-983-044	GW	X	X	X	X	X		
Screen 5	MW-983-043	GW	X	X	X	X	X		
MW-15	MW-983-042	GW	X	X	X	X	X		
MW-16	MW-983-041	GW	X	X	X	X	X	X	X
MW-17									
Screen 1	MW-983-040	GW	X	X	X	X	X		
Screen 2	MW-983-039	GW	X	X	X	X	X		
Screen 3	MW-983-038	GW	X	X	X	X	X	X	X
Screen 4	MW-983-037	GW	X	X	X	X	X		
Screen 5	MW-983-036	GW	X	X	X	X	X		
MW-18									
Screen 1	MW-983-035	GW	X	X	X	X	X		
Screen 2	MW-983-034	GW	X	X	X	X	X		
Screen 3	MW-983-033	GW	X	X	X	X	X		
Screen 4	MW-983-032	GW	X	X	X	X	X		
Screen 5	MW-983-031	GW	X	X	X	X	X		

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, JULY-AUGUST 1998

Sample Location	Sample Number	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	1,4-Dioxane EPA 8270	NDMA EPA 1625C
MW-19									
Screen 1	MW-983-030	GW	X	X	X	X	X		
Screen 2	MW-983-029	GW	X	X	X	X	X		
Screen 3	MW-983-028	GW	X	X	X	X	X		
Screen 4	MW-983-027	GW	X	X	X	X	X		
Screen 5	MW-983-026	GW	X	X	X	X	X		
MW-20									
Screen 1	MW-983-025	GW	X	X	X	X	X		
Screen 2	MW-983-024	GW	X	X	X	X	X		
Screen 3	MW-983-023	GW	X	X	X	X	X		
Screen 4	MW-983-022	GW	X	X	X	X	X		
Screen 5	MW-983-021	GW	X	X	X	X	X		
MW-21									
Screen 1	MW-983-020	GW	X	X	X	X	X		
Screen 2	MW-983-019	GW	X	X	X	X	X		
Screen 3	MW-983-018	GW	X	X	X	X	X		
Screen 4	MW-983-017	GW	X	X	X	X	X		
Screen 5	MW-983-016	GW	X	X	X	X	X		
MW-22									
Screen 1	MW-983-015	GW	X	X	X	X	X		
Screen 2	MW-983-014	GW	X	X	X	X	X		
Screen 3	MW-983-013	GW	X	X	X	X	X		
Screen 4	MW-983-012	GW	X	X	X	X	X		
Screen 5	MW-983-011	GW	X	X	X	X	X		
MW-23									
Screen 1	MW-983-010	GW	X	X	X	X	X		
Screen 2	MW-983-009	GW	X	X	X	X	X		
Screen 3	MW-983-008	GW	X	X	X	X	X		
Screen 4	MW-983-007	GW	X	X	X	X	X		
Screen 5	MW-983-006	GW	X	X	X	X	X		

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, JULY-AUGUST 1998

Sample Location	Sample Number	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	1,4-Dioxane EPA 8270	NDMA EPA 1625C
MW-24									
Screen 1	MW-983-005	GW	X	X	X	X	X	X	X
Screen 2	MW-983-004	GW	X	X	X	X	X		
Screen 3	MW-983-003	GW	X	X	X	X	X		
Screen 4	MW-983-002	GW	X	X	X	X	X		
Screen 5	MW-983-001	GW	X	X	X	X	X		

GW: Groundwater Sample
DUP: Duplicate Sample

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, JULY-AUGUST 1998

(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-983-079	--	--	--	--	--	--	--	--	--	--
MW-3											
Screen 1	MW-983-078	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-983-077	--	--	--	--	--	--	--	--	--	--
Screen 3	MW-983-076	**2.4**	0.6	--	--	--	--	--	3.6	--	10
Screen 4	MW-983-075	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-983-074	--	--	--	--	--	--	--	--	--	--
MW-4											
Screen 1	MW-983-073	--	--	--	--	--	--	--	--	3.4 Dichloromethane[b]	--
Screen 2	MW-983-072	**1.5**	3.0	0.8	--	--	--	--	2.0	--	**29**
Screen 2 (DUP)	MW-983-071	**1.4**	2.9	0.7	0.5	--	--	--	1.8	--	**29**
Screen 3	MW-983-070	--	--	--	--	--	--	--	--	1.0 Dichloromethane[b]	--
Screen 4	MW-983-069	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-983-068	--	--	--	--	--	--	--	--	--	--
MW-5	MW-983-067	--	--	--	--	--	--	--	--	6.5 Dichloromethane[b]	--
MW-6	MW-983-066	--	0.6	2.5	0.8	--	--	--	--	7.6 Dichloromethane[b]	4.2
MW-7	MW-983-065	**43**	**19**	0.8	--	**0.6**	0.9	3.4	9.0	1.0 Dichloromethane[b]	**190**
MW-8	MW-983-064	--	--	--	--	--	--	--	--	6.6 Dichloromethane[b]	--
MW-9	MW-983-063	--	--	--	--	--	--	--	--	--	--
MW-10	MW-983-062	--	--	--	--	--	--	--	--	7.8 Dichloromethane[b]	--
MW-10 (DUP)	MW-983-061	--	--	--	--	--	--	--	--	8.2 Dichloromethane[b]	--

TABLE 3-3

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, JULY-AUGUST 1998

(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-983-060	**1.5**	--	--	--	--	--	--	--	--	--
Screen 2	MW-983-059	**0.9**	--	--	--	--	--	--	0.6	--	--
Screen 3	MW-983-058	**1.5**	--	--	--	--	--	--	1.4	--	--
Screen 4	MW-983-057	--	--	--	--	--	--	--	0.5	--	--
Screen 5	MW-983-056	--	--	--	--	--	--	--	--	--	--
MW-12											
Screen 1	MW-983-055	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-983-054	**1.4**	--	--	--	--	--	--	0.9	--	4.5
Screen 2 (*DUP*)	MW-983-053	**1.1**	--	--	--	--	--	--	0.7	--	5.1
Screen 3	MW-983-052	**35**	--	--	--	--	--	--	2.2	--	6.6
Screen 4	MW-983-051	**5.1**	--	--	--	--	--	--	1.2	--	6.0
Screen 5	MW-983-050	**2.1**	--	--	--	--	--	--	0.6	--	--
MW-13	MW-983-049	**15**	**29**	0.6	--	--	1.1	0.7	7.5	0.5 Dichloromethane[b]	**57**
MW-13 (DUP)	MW-983-048	**14**	**28**	0.6	--	--	1.2	0.7	7.7	0.5 1,1,1-Trichloroethane 1.0 Dichloromethane[b]	**59**
MW-14											
Screen 1	MW-983-047	--	--	0.8	1.7	--	--	--	0.6	--	4.4
Screen 2	MW-983-046	--	0.9	1.8	0.8	--	--	--	0.6	--	4.9
Screen 3	MW-983-045	--	--	--	--	--	--	--	--	--	5.9
Screen 4	MW-983-044	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-983-043	--	--	--	--	--	--	--	--	--	--
MW-15	MW-983-042	--	--	--	--	--	--	--	--	--	--
MW-16	MW-983-041	**58**	**19**	1.3	--	**0.8**	2.7	1.2	23	1.0 1,1,1-Trichloroethane 0.6 Dichloromethane[b]	**420**

TABLE 3-3

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, JULY-AUGUST 1998

(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-983-040	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-983-039	--	--	--	--	--	--	--	2.4	--	--
Screen 3	MW-983-038	--	1.0	--	--	--	--	--	4.9	--	--
Screen 4	MW-983-037	--	**8.9**	0.6	--	--	--	--	1.9	--	14
Screen 5	MW-983-036	--	**8.9**	0.6	--	--	--	--	2.0	--	13
MW-18											
Screen 1	MW-983-035	--	--	--	--	--	--	--	--	3.4 Unknown Hydrocarbon (RT=7.14)	--
Screen 2	MW-983-034	--	--	--	--	--	--	--	0.9	--	--
Screen 3	MW-983-033	--	1.5	0.9	--	--	--	--	4.6	--	5.2
Screen 4	MW-983-032	**2.5**	0.6	1.2	--	--	--	--	0.6	--	16
Screen 5	MW-983-031	--	--	--	--	--	--	--	--	4.6 Hexane	--
MW-19											
Screen 1	MW-983-030	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-983-029	--	0.6	0.7	--	--	--	--	--	--	--
Screen 3	MW-983-028	--	--	2.1	--	--	--	--	--	--	4.4
Screen 4	MW-983-027	--	--	--	--	--	--	--	1.4	--	--
Screen 5	MW-983-026	--	--	1.5	--	--	--	--	--	--	--
MW-20											
Screen 1	MW-983-025	--	--	--	--	--	--	--	1.8	--	5.9
Screen 2	MW-983-024	--	--	--	--	--	--	--	3.7	0.5 Dichlorobromomethane	--
Screen 3	MW-983-023	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-983-022	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-983-021	--	--	--	--	--	--	--	--	--	--

TABLE 3-3

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, JULY-AUGUST 1998

(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	MW-983-020	--	**16**	0.6	--	--	--	--	1.8	--	13
Screen 2	MW-983-019	--	--	0.7	--	--	--	--	0.7	--	--
Screen 3	MW-983-018	--	--	0.9	--	--	--	--	--	--	--
Screen 4	MW-983-017	--	0.8	4.3	--	--	--	--	--	0.8 cis-1,2-Dichloroethene	4.3
Screen 5	MW-983-016	--	--	**7.6**	--	--	--	--	0.6	1.5 cis-1,2-Dichloroethene	--
MW-22											
Screen 1	MW-983-015	--	0.9	1.7	0.6	--	--	--	--	--	6.4
Screen 2	MW-983-014	--	--	--	--	--	--	--	--	--	4.9
Screen 3	MW-983-013	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-983-012	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-983-011	--	--	--	--	--	--	--	--	--	--
MW-23											
Screen 1	MW-983-010	**0.5**	**9.2**	--	--	--	--	--	1.0	2.2 Dichloromethane[b]	**19**
Screen 2	MW-983-009	--	1.1	1.0	0.8	--	--	--	0.7	1.8 Dichloromethane[b]	7.8
Screen 3	MW-983-008	--	--	--	--	--	--	--	--	1.7 Dichloromethane[b]	--
Screen 4	MW-983-007	--	--	--	--	--	--	--	--	2.3 Dichloromethane[b]	--
Screen 5	MW-983-006	--	--	--	--	--	--	--	--	1.7 Dichloromethane[b] 3.0 Unknown (RT=3.93)	--
MW-24											
Screen 1	MW-983-005	--	1.7	--	--	--	--	--	0.9	--	**20**
Screen 2	MW-983-004	**58**	4.0	1.5	--	--	2.0	--	8.4	--	**500**
Screen 3	MW-983-003	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-983-002	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-983-001	--	--	--	--	--	--	--	--	--	--

TABLE 3-3

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, JULY-AUGUST 1998

(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 Contaminant Level		0.5	5.0	5.0	5.0	0.5	6.0	1,200	100	6 cis-1,2-Dichloroethene(a) 100 1,1,1-Trichloroethane(a)	18(1)
EPA Region IX Maximum Contaminant Level		5.0	5.0	5.0	NE	5.0	7.0	NE	100	100 Dichlorobromomethane(a) 70 cis-1,2-Dichloroethene(a) 5 Dichloromethane(a) 200 1,1,1-Trichloroethane(a)	NE

--: Not detected
DUP: Duplicate
NE: Not established
RT: Retention time
1: California Department of Health Services Interim Action Level
a: Only VOCs for which MCLs have been established are listed
b: Attributed to Laboratory Contamination

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	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
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	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
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
	Jan/Feb 1998	**1.2**	--	--	--	--	--	--	2.7	--	6.5
	Apr/May 1998	**3.6**	0.9	--	--	--	--	--	3.9	--	6.2
	Jul/Aug 1998	**2.4**	0.6	--	--	--	--	--	3.6	--	10

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	--	--	--	--	--	--	--	--	1.2 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	1.0 Hexane	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	4.7 Carbon disulfide(4)	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
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
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	9.6
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	3.4 Dichloromethane(b)	--
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**
	Jan/Feb 1998	**1.9**	2.7	0.6	--	--	--	--	1.8	--	**30**
	Apr/May 1998	**2.8**	4.3	0.7	0.5	--	--	--	3.1	--	**41**
	Jul/Aug 1998	**1.5**	3.0	0.8	0.5	--	--	--	2.0	--	**29**

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	--	--	--	--	--	--	--	--	3.0(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.5 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	1.0 Dichloromethane[b]	--
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	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
Screen 5	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.9 Acetone	NA
	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	7.4 Hexane	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
MW-5	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	4.2
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	6.5 Dichloromethane[b]	--
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	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	2.0	1.0	--	--	--	--	--	--
	Apr/May 1998	--	0.7	3.2	1.1	--	--	--	0.6	--	--

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
	Jul/Aug 1998	--	0.6	2.5	0.8	--	--	--	--	7.6 Dichloromethane[b]	4.2
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**
	Jan/Feb 1998	**150**	**24**	3.7	--	**0.8**	2.1	6.4	13	--	**720**
	Apr/May 1998	**31**	**13**	0.5	--	--	--	3.1	6.1	--	**130**
	Jul/Aug 1998	**43**	**19**	0.8	--	**0.6**	0.9	3.4	9.0	1.0 Dichloromethane[b]	**190**
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**
	Jan/Feb 1998	**1.8**	1.3	--	--	--	--	--	0.8	0.8 Freon 11	11
	Apr/May 1998	**1.3**	1.3	--	--	--	--	--	0.5	--	7.6
	Jul/Aug 1998	--	--	--	--	--	--	--	--	6.6 Dichloromethane[b]	--
MW-9	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	3.9 Unknown RT=6.21	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
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
	Jan/Feb 1998	--	1.1	2.2	1.6	--	--	--	1.4	--	4.7
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	8.2 Dichloromethane[b]	--

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-11											
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.6(B) Acetone 7.1 MTBE	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.8 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	**1.4**	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	**1.5**	--	--	--	--	--	--	--	--	--
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	--	--
	Jan/Feb 1998	**0.7**	--	--	--	--	--	--	0.7	--	--
	Apr/May 1998	**1.0**	--	--	--	--	--	--	0.7	--	--
	Jul/Aug 1998	**0.9**	--	--	--	--	--	--	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	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	1.4	--	--
	Apr/May 1998	**1.0**	--	--	--	--	--	--	1.3	--	--
	Jul/Aug 1998	**1.5**	--	--	--	--	--	--	1.4	--	--
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	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	0.5	--	--
	Apr/May 1998	--	--	--	--	--	--	--	0.5	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	0.5	--	--

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	--	--	--	--	--	--	--	--	2.4(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.1 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	44 Carbon disulfide(4)	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
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*									
	Jan/Feb 1998	--	--	--	--	--	--	--	0.8	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
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
	Jan/Feb 1998	**1.1**	--	--	--	--	--	--	0.6	--	6.3
	Apr/May 1998	**1.2**	--	--	--	--	--	--	0.9	--	6.0
	Jul/Aug 1998	**1.4**	--	--	--	--	--	--	0.9	--	5.1
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
	Jan/Feb 1998	**23E**	--	--	--	--	--	--	2.3	--	5.9
	Apr/May 1998	**25**	--	--	--	--	--	--	2.0	--	6.9
	Jul/Aug 1998	**35**	--	--	--	--	--	--	2.2	--	6.6

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	**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
	Jan/Feb 1998	**4.0**	--	--	--	--	--	--	1.1	--	8.0
	Apr/May 1998	**4.3**	--	--	--	--	--	--	1.2	--	8.0
	Jul/Aug 1998	**5.1**	--	--	--	--	--	--	1.2	--	6.0
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**	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	**1.3**	--	--	--	--	--	--	--	--	--
	Apr/May 1998	**1.7**	--	--	--	--	--	--	0.6	--	--
	Jul/Aug 1998	**2.1**	--	--	--	--	--	--	0.6	--	--
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**
	Jan/Feb 1998	**12**	**5.2**	0.5	--	--	0.5 (DUP [3])	--	2.9	1.8 Freon 11	**99**
	Apr/May 1998	**13**	**17**	0.6	--	--	0.9	0.6	5.7	--	**100**
	Jul/Aug 1998	**15**	**29**	0.6	--	--	1.2	0.7	7.7	1.0 Dichloromethane[(b)] 0.5 1,1,1-Trichloroethane	**59**
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	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	2.1	--	--	--	0.5	--	--
	Apr/May 1998	--	--	1.2	0.8	--	--	--	0.8	--	4.4
	Jul/Aug 1998	--	--	0.8	1.7	--	--	--	0.6	--	4.4

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 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	--	--
	Jan/Feb 1998	--	--	1.2	0.7	--	--	--	--	8.9 Carbon disulfide(4)	9.0
	Apr/May 1998	--	--	1.2	0.7	--	--	--	0.6	--	4.0
	Jul/Aug 1998	--	0.9	1.8	0.8	--	--	--	0.6	--	4.9
Screen 3	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	4.3
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	5.6
	Apr/May 1998	--	--	--	--	--	--	--	--	--	5.8
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	5.9
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.1(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.6(TB) Acetone 1.3 Carbon disulfide	NA NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	4.6 Carbon disulfide(4)	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--

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-15	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	2.6 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
MW-16	Aug/Sep 1996	**125**	**33**	1.3	--	**2.4**	2.2	2.0	40(TB)	--	NA
	Oct/Nov 1996	Not Sampled*									
	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*									
	Jan/Feb 1998	**30**	3.5	1.0	--	--	1.3	--	14	--	**1230**
	Apr/May 1998	**42**	**12**	0.8	--	**1.4**	1.6	1.2	20	--	**640**
	Jul/Aug 1998	**58**	**19**	1.3	--	**0.8**	2.7	1.2	23	0.6 Dichloromethane[b] 1.0 1,1,1-Trichloroethane	**420**
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	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	2.9	--	--
	Apr/May 1998	--	--	--	--	--	--	--	3.2	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
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	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	5.4	--	--
	Apr/May 1998	--	--	--	--	--	--	--	3.2	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	2.4	--	--

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 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**
	Jan/Feb 1998	**3.3**	**8.7**	--	--	--	--	--	6.8	--	**25**
	Apr/May 1998	--	0.9	--	--	--	--	--	5.3	--	--
	Jul/Aug 1998	--	1.0	--	--	--	--	--	4.9	--	--
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
	Jan/Feb 1998	--	**7.3**	0.6	--	--	--	--	1.2	--	16
	Apr/May 1998	--	**7.6**	0.6	--	--	--	--	1.5	--	17
	Jul/Aug 1998	--	**8.9**	0.6	--	--	--	--	1.9	--	14
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
	Jan/Feb 1998	--	**7.9**	--	--	--	--	--	1.5	--	15
	Apr/May 1998	--	**8.8**	0.6	--	--	--	--	1.8	--	15
	Jul/Aug 1998	--	**8.9**	0.6	--	--	--	--	2.0	--	13
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*									
	Jan/Feb 1998	Not Sampled*									
	Apr/May 1998	--	--	--	--	--	--	--	0.7	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	3.4 Unknown Hydrocarbon (RT=7.14)	--

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	--	--	--	--	--	--	--	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	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	3.7	--	--
	Apr/May 1998	--	--	--	--	--	--	--	3.2	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	0.9	--	--
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	--	--
	Jan/Feb 1998	--	1.9	1.7	--	--	--	--	6.6	4.1 Unknown (RT=4.33)	--
	Apr/May 1998	**0.5**	1.8	1.3	--	--	--	--	5.7	--	5.0
	Jul/Aug 1998	--	1.5	0.9	--	--	--	--	4.6	--	5.2
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
	Jan/Feb 1998	**2.6**	--	1.0	--	--	--	--	0.5	--	11
	Apr/May 1998	**3.1**	0.6	1.4	--	--	--	--	0.8	--	13
	Jul/Aug 1998	**2.5**	0.6	1.2	--	--	--	--	0.6	--	16
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	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	4.6 Hexane	--

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-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	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	0.8	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	0.6	0.9	--	--	--	--	--	--	--
	Apr/May 1998	--	0.9	1.2	--	--	--	--	--	--	--
	Jul/Aug 1998	--	0.6	0.7	--	--	--	--	--	--	--
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	--
	Jan/Feb 1998	--	--	2.1	--	--	--	--	--	--	--
	Apr/May 1998	--	--	2.5	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	2.1	--	--	--	--	--	--	4.4
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
	Jan/Feb 1998	--	0.5	0.6	--	--	--	--	1.3	--	--
	Apr/May 1998	--	0.8	1.0	--	--	--	--	1.6	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	1.4	--	--

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	--	--	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	--	--
	Jan/Feb 1998	--	--	1.4	--	--	--	--	--	--	--
	Apr/May 1998	--	--	0.9	--	--	--	--	0.6	--	--
	Jul/Aug 1998	--	--	1.5	--	--	--	--	--	--	--
MW-20											
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	0.7	3.4(B) Acetone	NA
	Oct/Nov 1996	Not Sampled*									
	Feb/Mar 1997	--	--	--	--	--	--	--	1.4	2.4(EB) Acetone	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	0.8	--	5.7
	Sep/Oct 1997	Not Sampled*									
	Jan/Feb 1998	--	--	--	--	--	--	--	1.4	--	6.3
	Apr/May 1998	--	--	--	--	--	--	--	2.5	--	5.5
	Jul/Aug 1998	--	--	--	--	--	--	--	1.8	--	5.9
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	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	2.7	--	--
	Apr/May 1998	--	--	--	--	--	--	--	2.7	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	4.2	0.5 Dichlorobromomethane	--
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	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	3.4 Unknown (RT=6.2)	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--

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	--	--	--	--	--	--	--	--	3.8(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	**21**
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	4.8(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	**21**
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
MW-21											
Screen 1	Aug/Sep 1996	--	**33**	0.7	--	--	--	--	1.8	2.3(B) Acetone	NA
	Oct/Nov 1996	Not Sampled*									
	Feb/Mar 1997	--	**29**	--	--	--	--	--	2.2	--	NA
	Jun/Jul 1997	--	**20**	--	--	--	--	--	1.6	--	**19**
	Sep/Oct 1997	Not Sampled*									
	Jan/Feb 1998	--	**16**	--	--	--	--	--	1.8	--	14
	Apr/May 1998	--	**16**	--	--	--	--	--	1.8	--	14
	Jul/Aug 1998	--	**16**	0.6	--	--	--	--	1.8	--	13
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	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	1.1	--	--	--	--	--	--	--
	Apr/May 1998	--	--	1.0	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	0.7	--	--	--	--	0.7	--	--

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	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	--	--	--	--	--	--	--
	Jan/Feb 1998	--	0.5	1.4	--	--	--	--	--	--	--
	Apr/May 1998	--	--	1.1	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	0.9	--	--	--	--	--	--	--
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
	Jan/Feb 1998	--	--	2.4	--	--	--	--	--	--	--
	Apr/May 1998	--	0.6	4.4	--	--	--	--	--	0.7 cis-1,2-Dichloroethene	--
	Jul/Aug 1998	--	0.8	4.3	--	--	--	--	--	0.8 cis-1,2-Dichloroethene	4.3
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	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	4.1	--	--	--	--	--	0.6 cis-1,2-Dichloroethene 5.0 Carbon disulfide(4)	5.2
	Apr/May 1998	--	--	**6.5**	--	--	--	--	--	1.0 cis-1,2-Dichloroethene	5.8
	Jul/Aug 1998	--	--	**7.6**	--	--	--	--	0.6	1.5 cis-1,2-Dichloroethene	--
MW-22(1)											
Screen 1	Sep/Oct 1997	--	--	2.0	0.7	--	--	--	--	--	--
	Jan/Feb 1998	--	--	2.3	0.8	--	--	0.5	--	--	--
	Apr/May 1998	--	0.9	2.1	0.8	--	--	--	0.5	--	5.4
	Jul/Aug 1998	--	0.9	1.7	0.6	--	--	--	--	--	6.4
Screen 2	Sep/Oct 1997	--	--	--	--	--	--	--	--	0.8 Dichloromethane	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	4.9
Screen 3	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	15
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--

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	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	
Screen 5	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	
MW-23(1)											
Screen 1	Sep/Oct 1997	--	3.1	0.6	0.8	--	--	--	--	--	4.4
	Jan/Feb 1998	--	4.2	1.6	1.2	--	--	--	0.9	0.6 1,2,3-Trichlorobenzene	5.2
	Apr/May 1998	**0.5**	**16**	0.8	1.2	--	--	--	1.9	--	16
	Jul/Aug 1998	**0.5**	**9.2**	--	--	--	--	--	1.0	2.2 Dichloromethane(b)	**19**
Screen 2	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	7.6
	Jan/Feb 1998	--	--	--	--	--	--	--	0.7	--	6.7
	Apr/May 1998	--	--	--	--	--	--	--	--	--	7.5
	Jul/Aug 1998	--	1.1	1.0	0.8	--	--	--	0.7	1.8 Dichloromethane(b)	7.8
Screen 3	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	1.7 Dichloromethane(b)	--
Screen 4	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	2.3 Dichloromethane(b)	--
Screen 5	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	1.7 Dichloromethane(b) 3.0 Unknown (RT=3.93)	--
MW-24(1)											
Screen 1	Sep/Oct 1997	**5.0**	**5.0**	--	--	--	--	0.6	3.1	--	**92**
	Jan/Feb 1998	**30E**	**15**	0.5	--	**0.8**	--	0.6	15	--	**330**
	Apr/May 1998	**6.7**	**5.4**	--	--	--	--	--	3.3	--	**74**
	Jul/Aug 1998	--	1.7	--	--	--	--	--	0.9	--	**20**

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 2	Sep/Oct 1997	**13**	1.3	--	--	--	--	--	3.8	--	**200**
	Jan/Feb 1998	**6.9**	0.7	--	--	--	--	--	2.4	--	**110**
	Apr/May 1998	**29**	3.3	0.9	--	--	1.4	--	9.4	--	**480**
	Jul/Aug 1998	**58**	4.0	1.5	--	--	2.0	--	8.4	--	**500**
Screen 3	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
Screen 4	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
Screen 5	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
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] 6.0 cis-1,2-Dichloroethene[a] 1,1,1-Trichloroethane[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] 70 cis-1,2-Dichloroethene[a] 1,1,1-Trichloroethane[a]	NE

--: Not detected
*: Not sampled, no water over screen
a: Only VOCs for which MCLs have been established are listed
b: Attributed to Laboratory Contamination
TB: Compound detected in associated trip blank
B: Compound detected in the laboratory method blank
E: Estimated concentration; result exceeded calibration range
NA: Not analyzed
NE: Not established
RT: Retention time
1: Wells installed June-August 1997
2: California Department of Health Services Interim Action Level
3: DUP – Results from duplicate analysis; original sample was non-detect.
4: Suspected by the laboratory to have resulted from carry over in analysis (see January/February 1998 report)

TABLE 3-5

SUMMARY OF METALS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, JULY-AUGUST 1998

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

Sample Location	Sample Number	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-1	MW-983-079	--	0.009	**0.055**	--	1.0
MW-3						
Screen 1	MW-983-078	--	--	--	--	4.5
Screen 2	MW-983-077	--	0.004	--	--	3.3
Screen 3	MW-983-076	--	--	--	--	4.6
Screen 4	MW-983-075	--	--	--	--	3.1
Screen 5	MW-983-074	0.006	--	--	--	3.2
MW-4						
Screen 1	MW-983-073	--	--	--	--	3.0
Screen 2	MW-983-072	--	--	0.011	--	4.9
Screen 2 (DUP)	MW-983-071	--	--	--	--	4.9
Screen 3	MW-983-070	--	--	--	--	3.9
Screen 4	MW-983-069	--	0.007	--	--	3.6
Screen 5	MW-983-068	0.005	--	--	--	4.6
MW-5	MW-983-067	--	--	--	--	4.6
MW-6	MW-983-066	--	--	0.013	--	3.0
MW-7	MW-983-065	--	--	--	--	4.7
MW-8	MW-983-064	--	--	--	--	1.2
MW-9	MW-983-063	--	--	--	--	3.0
MW-10	MW-983-062	--	--	--	--	3.8
MW-10 DUP	MW-983-061	--	--	--	--	3.8
MW-11						
Screen 1	MW-983-060	--	--	--	--	4.6
Screen 2	MW-983-059	--	--	--	--	3.5
Screen 3	MW-983-058	--	--	--	--	2.6
Screen 4	MW-983-057	--	--	--	--	3.7
Screen 5	MW-983-056	--	--	--	--	1.7
MW-12						
Screen 1	MW-983-055	--	--	--	--	5.0
Screen 2	MW-983-054	--	0.006	--	--	3.7
Screen 2 (DUP)	MW-983-053	--	0.003	--	--	3.7
Screen 3	MW-983-052	--	0.018	--	--	3.2
Screen 4	MW-983-051	--	--	--	--	3.7
Screen 5	MW-983-050	--	--	--	--	3.1

TABLE 3-5

SUMMARY OF METALS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, JULY-AUGUST 1998

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

Sample Location	Sample Number	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-13	MW-983-049	--	--	0.025	0.023	1.0
MW-13 DUP	MW-983-048	--	--	0.025	0.023	1.0
MW-14						
Screen 1	MW-983-047	--	--	--	--	3.8
Screen 2	MW-983-046	--	--	--	--	4.8
Screen 3	MW-983-045	--	--	--	--	3.1
Screen 4	MW-983-044	--	--	--	--	1.0
Screen 5	MW-983-043	--	--	--	--	2.4
MW-15	MW-983-042	--	--	--	--	3.0
MW-16	MW-983-041	--	--	--	--	1.9
MW-17						
Screen 1	MW-983-040	--	--	--	--	1.5
Screen 2	MW-983-039	--	0.007	--	--	1.0
Screen 3	MW-983-038	--	--	--	--	4.0
Screen 4	MW-983-037	--	--	--	--	4.4
Screen 5	MW-983-036	--	--	--	--	4.8
MW-18						
Screen 1	MW-983-035	--	--	--	--	3.8
Screen 2	MW-983-034	--	--	--	--	3.1
Screen 3	MW-983-033	--	--	0.014	--	2.3
Screen 4	MW-983-032	--	--	--	--	2.5
Screen 5	MW-983-031	--	--	--	--	1.1
MW-19						
Screen 1	MW-983-030	--	--	--	--	4.9
Screen 2	MW-983-029	--	--	--	--	4.9
Screen 3	MW-983-028	--	--	--	--	3.9
Screen 4	MW-983-027	--	--	--	--	4.6
Screen 5	MW-983-026	--	0.010	--	--	4.8
MW-20						
Screen 1	MW-983-025	--	--	--	--	3.2
Screen 2	MW-983-024	--	--	--	--	1.3
Screen 3	MW-983-023	--	--	--	--	0.7
Screen 4	MW-983-022	--	--	--	--	2.1
Screen 5	MW-983-021	--	--	--	--	3.3

TABLE 3-5

SUMMARY OF METALS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, JULY-AUGUST 1998

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

Sample Location	Sample Number	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-21						
Screen 1	MW-983-020	--	--	--	--	3.4
Screen 2	MW-983-019	--	--	--	--	3.9
Screen 3	MW-983-018	--	--	--	--	4.8
Screen 4	MW-983-017	--	--	--	--	2.4
Screen 5	MW-983-016	--	--	--	--	4.2
MW-22						
Screen 1	MW-983-015	--	--	--	--	4.8
Screen 2	MW-983-014	--	--	--	--	4.4
Screen 3	MW-983-013	--	--	--	--	4.9
Screen 4	MW-983-012	--	--	--	--	4.0
Screen 5	MW-983-011	--	--	--	--	2.3
MW-23						
Screen 1	MW-983-010	--	--	--	--	4.0
Screen 2	MW-983-009	--	--	--	--	3.4
Screen 3	MW-983-008	--	--	--	--	4.7
Screen 4	MW-983-007	--	--	--	--	4.6
Screen 5	MW-983-006	--	--	--	--	1.7
MW-24						
Screen 1	MW-983-005	--	--	--	--	4.9
Screen 2	MW-983-004	--	--	--	--	4.8
Screen 3	MW-983-003	--	--	--	--	4.9
Screen 4	MW-983-002	--	--	--	--	4.8
Screen 5	MW-983-001	--	--	--	--	4.0
Practical Quantitation Limit		0.005	0.002	0.01	0.005	
California Maximum Contaminant Level		0.050	0.050	0.05	NE	
EPA Maximum Contaminant Level		0.050	0.15[1]	0.10	NE	

(DUP): Duplicate.
NE: Not established.
--: Not detected.
1: Action Level: Treatment technique and public notification triggered.

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE 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	--	--	--	--	1.9
	Sep/Oct 1997	--	--	--	--	0.7
	Jan/Feb 1998	--	--	--	--	1.6
	Apr/May 1998	--	--	--	--	0.5
	Jul/Aug 1998	--	0.009	**0.055**	--	1.0
MW-3						
Screen 1	Aug/Sep 1996	--	--	--	--	7.2
	Oct/Nov 1996	--	--	--	--	3.1
	Feb/Mar 1997	--	--	--	--	6.1
	Jun/Jul 1997	--	--	--	--	2.6
	Sep/Oct 1997	--	--	--	--	2.1
	Jan/Feb 1998	--	--	--	--	2.9
	Apr/May 1998	--	--	--	--	4.8
	Jul/Aug 1998	--	--	--	--	4.5
Screen 2	Aug/Sep 1996	--	--	--	--	1.7
	Oct/Nov 1996	--	--	--	--	2.7
	Feb/Mar 1997	--	--	--	--	3.8
	Jun/Jul 1997	--	--	--	--	1.1
	Sep/Oct 1997	--	--	--	--	2.1
	Jan/Feb 1998	--	--	--	--	2.3
	Apr/May 1998	--	--	--	--	4.3
	Jul/Aug 1998	--	0.004	--	--	3.3
Screen 3	Aug/Sep 1996	--	--	--	--	5.2
	Oct/Nov 1996	--	--	--	--	2.7
	Feb/Mar 1997	--	--	--	--	1.7
	Jun/Jul 1997	--	--	--	--	3.4
	Sep/Oct 1997	--	--	--	--	5.0
	Jan/Feb 1998	--	--	--	--	4.9
	Apr/May 1998	--	--	--	--	4.7
	Jul/Aug 1998	--	--	--	--	4.6
Screen 4	Aug/Sep 1996	--	--	--	--	4.3
	Oct/Nov 1996	--	--	--	--	2.6
	Feb/Mar 1997	--	--	--	--	4.5
	Jun/Jul 1997	--	--	--	--	2.7
	Sep/Oct 1997	--	--	--	--	2.5
	Jan/Feb 1998	--	--	--	--	3.0
	Apr/May 1998	--	--	--	--	3.6
	Jul/Aug 1998	--	--	--	--	3.1

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE 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	0.011	--	--	--	1.5
	Oct/Nov 1996	0.007	--	--	--	1.9
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	0.007	--	--	--	0.8
	Sep/Oct 1997	0.010	--	--	--	1.0
	Jan/Feb 1998	0.009	0.008	--	--	2.3
	Apr/May 1998	--	0.002	--	--	2.0
	Jul/Aug 1998	0.006	--	--	--	3.2
MW-4						
Screen 1	Aug/Sep 1996	--	--	--	--	2.6
	Oct/Nov 1996	--	--	--	--	1.7
	Feb/Mar 1997	--	--	--	--	4.6
	Jun/Jul 1997	--	--	--	--	2.8
	Sep/Oct 1997	--	--	--	--	4.8
	Jan/Feb 1998	--	--	--	--	3.4
	Apr/May 1998	--	--	--	--	3.7
	Jul/Aug 1998	--	--	--	--	3.0
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	--	2.7
	Sep/Oct 1997	--	--	0.012	--	3.5
	Jan/Feb 1998	--	--	--	--	4.8
	Apr/May 1998	--	--	--	--	1.8
	Jul/Aug 1998	--	--	0.011	--	4.9
Screen 3	Aug/Sep 1996	--	--	--	--	0.6
	Oct/Nov 1996	--	--	--	--	1.5
	Feb/Mar 1997	--	--	--	--	2.8
	Jun/Jul 1997	--	--	--	--	2.0
	Sep/Oct 1997	--	--	--	--	1.4
	Jan/Feb 1998	--	--	--	--	4.6
	Apr/May 1998	--	--	--	--	3.2
	Jul/Aug 1998	--	--	--	--	3.9
Screen 4	Aug/Sep 1996	--	--	--	--	3.0
	Oct/Nov 1996	--	--	--	--	1.4
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	--	--	--	--	4.6
	Sep/Oct 1997	--	--	--	--	3.3
	Jan/Feb 1998	--	--	--	--	4.7
	Apr/May 1998	--	--	--	--	2.0
	Jul/Aug 1998	--	--	0.007	--	3.6

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE 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	--	--	--	--	4.5
	Oct/Nov 1996	--	--	--	--	4.1
	Feb/Mar 1997	--	--	--	--	4.4
	Jun/Jul 1997	--	--	--	--	4.0
	Sep/Oct 1997	--	--	--	--	3.9
	Jan/Feb 1998	--	--	--	--	4.5
	Apr/May 1998	--	--	--	--	3.8
	Jul/Aug 1998	0.005	--	--	--	4.6
MW-5	Aug/Sep 1996	--	--	--	--	2.7
	Oct/Nov 1996	--	0.003	--	--	2.7
	Feb/Mar 1997	--	--	--	--	1.5
	Jun/Jul 1997	--	--	--	--	4.5
	Sep/Oct 1997	--	--	--	--	1.0
	Jan/Feb 1998	--	--	--	--	0.9
	Apr/May 1998	--	--	--	--	3.1
	Jul/Aug 1998	--	--	--	--	4.6
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	--	2.5
	Sep/Oct 1997	--	--	--	--	1.8
	Jan/Feb 1998	--	--	--	--	0.4
	Apr/May 1998	--	--	0.012	--	2.1
	Jul/Aug 1998	--	--	0.013	--	3.0
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	--	--	--	--	1.0
	Sep/Oct 1997	--	--	0.018	--	0.8
	Jan/Feb 1998	--	--	0.012	--	1.2
	Apr/May 1998	--	--	--	--	4.1
	Jul/Aug 1998	--	--	--	--	4.7
MW-8	Aug/Sep 1996	--	--	--	--	4.0
	Oct/Nov 1996	--	0.003	--	--	4.7
	Feb/Mar 1997	--	--	--	--	3.1
	Jun/Jul 1997	--	0.002	--	--	4.6
	Sep/Oct 1997	--	--	--	--	4.2
	Jan/Feb 1998	--	--	--	--	3.4
	Apr/May 1998	--	--	0.013	--	2.6
	Jul/Aug 1998	--	--	--	--	1.2

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE 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-9	Aug/Sep 1996	--	--	--	--	2.1
	Oct/Nov 1996	--	--	--	--	2.5
	Feb/Mar 1997	--	--	--	--	4.2
	Jun/Jul 1997	--	--	--	--	3.2
	Sep/Oct 1997	--	--	--	--	1.0
	Jan/Feb 1998	--	--	--	--	2.4
	Apr/May 1998	--	--	--	--	1.3
	Jul/Aug 1998	--	--	--	--	3.0
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	--	2.9
	Sep/Oct 1997	--	--	--	--	3.2
	Jan/Feb 1998	--	--	--	--	2.1
	Apr/May 1998	--	0.008	0.010	--	2.6
	Jul/Aug 1998	--	--	--	--	3.8
MW-11						
Screen 1	Aug/Sep 1996	--	--	--	--	4.0
	Oct/Nov 1996	--	--	--	--	2.5
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	--	--	--	--	1.5
	Sep/Oct 1997	--	--	--	--	4.6
	Jan/Feb 1998	--	--	--	--	1.0
	Apr/May 1998	--	--	--	--	1.0
	Jul/Aug 1998	--	--	--	--	4.6
Screen 2	Aug/Sep 1996	--	--	--	--	4.5
	Oct/Nov 1996	--	--	--	--	4.7
	Feb/Mar 1997	--	--	--	--	3.1
	Jun/Jul 1997	--	--	--	--	4.7
	Sep/Oct 1997	--	--	--	--	3.0
	Jan/Feb 1998	--	--	--	--	2.4
	Apr/May 1998	--	--	--	--	1.4
	Jul/Aug 1998	--	--	--	--	3.5
Screen 3	Aug/Sep 1996	--	--	--	--	0.5
	Oct/Nov 1996	--	--	--	--	2.3
	Feb/Mar 1997	--	--	--	--	1.7
	Jun/Jul 1997	--	--	--	--	1.9
	Sep/Oct 1997	--	--	--	--	3.0
	Jan/Feb 1998	--	--	--	--	1.4
	Apr/May 1998	--	--	--	--	2.1
	Jul/Aug 1998	--	--	--	--	2.6

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE 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	--	--	--	--	3.9
	Oct/Nov 1996	--	--	--	--	3.3
	Feb/Mar 1997	--	0.009	--	--	5.2
	Jun/Jul 1997	--	--	--	--	4.8
	Sep/Oct 1997	--	--	--	--	5.0
	Jan/Feb 1998	--	--	--	--	3.4
	Apr/May 1998	--	--	--	--	4.2
	Jul/Aug 1998	--	--	--	--	3.7
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	--	--	--	--	0.7
	Sep/Oct 1997	--	--	--	--	2.6
	Jan/Feb 1998	--	--	--	--	1.2
	Apr/May 1998	--	--	--	--	1.7
	Jul/Aug 1998	--	--	--	--	1.7
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	--	--	--	--	4.8
	Sep/Oct 1997	Not Sampled*				
	Jan/Feb 1998	--	--	--	--	2.6
	Apr/May 1998	--	--	0.010	--	4.8
	Jul/Aug 1998	--	--	--	--	5.0
Screen 2	Aug/Sep 1996	--	0.024	--	--	4.0
	Oct/Nov 1996	--	--	--	--	4.0
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	--	--	--	--	3.2
	Sep/Oct 1997	--	--	--	--	3.4
	Jan/Feb 1998	--	--	--	--	4.4
	Apr/May 1998	--	--	--	--	1.6
	Jul/Aug 1998	--	0.006	--	--	3.7
Screen 3	Aug/Sep 1996	--	--	--	--	2.5
	Oct/Nov 1996	--	--	--	--	3.1
	Feb/Mar 1997	--	--	--	--	5.0
	Jun/Jul 1997	--	--	--	--	4.8
	Sep/Oct 1997	--	--	--	--	4.2
	Jan/Feb 1998	--	--	--	--	2.8
	Apr/May 1998	--	--	--	--	4.4
	Jul/Aug 1998	--	0.018	--	--	3.2

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE 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	--	0.005	--	--	1.8
	Oct/Nov 1996	--	--	--	--	0.7
	Feb/Mar 1997	--	--	--	--	2.4
	Jun/Jul 1997	--	--	--	--	2.5
	Sep/Oct 1997	--	--	--	--	1.6
	Jan/Feb 1998	--	--	--	--	3.4
	Apr/May 1998	--	--	--	--	1.7
	Jul/Aug 1998	--	--	--	--	3.7
Screen 5	Aug/Sep 1996	--	--	--	--	2.0
	Oct/Nov 1996	--	--	--	--	2.0
	Feb/Mar 1997	--	--	--	--	1.5
	Jun/Jul 1997	--	--	--	--	5.0
	Sep/Oct 1997	--	--	--	--	1.0
	Jan/Feb 1998	--	--	--	--	2.2
	Apr/May 1998	--	--	--	--	3.5
	Jul/Aug 1998	--	--	--	--	3.1
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	1.2
	Sep/Oct 1997	--	--	**0.050**	0.045	2.4
	Jan/Feb 1998	--	0.003	0.040	0.036	1.0
	Apr/May 1998	--	--	**0.082**	0.024	3.5
	Jul/Aug 1998	--	--	0.025	0.023	1.0
MW-14						
Screen 1	Aug/Sep 1996	--	--	--	--	3.3
	Oct/Nov 1996	--	--	--	--	4.5
	Feb/Mar 1997	--	--	--	--	4.3
	Jun/Jul 1997	--	--	--	--	2.2
	Sep/Oct 1997	--	--	--	--	3.9
	Jan/Feb 1998	--	0.004	--	--	5.0
	Apr/May 1998	--	--	0.011	--	3.1
	Jul/Aug 1998	--	--	--	--	3.8
Screen 2	Aug/Sep 1996	--	--	--	--	4.4
	Oct/Nov 1996	--	--	--	--	3.8
	Feb/Mar 1997	--	--	--	--	4.8
	Jun/Jul 1997	--	--	--	--	5.0
	Sep/Oct 1997	--	--	--	--	3.2
	Jan/Feb 1998	--	0.003	--	--	4.8
	Apr/May 1998	--	--	--	--	4.9
	Jul/Aug 1998	--	--	--	--	4.8

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE 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	--	--	--	--	1.7
	Oct/Nov 1996	--	--	--	--	2.0
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	--	--	--	--	0.7
	Sep/Oct 1997	--	--	--	--	2.9
	Jan/Feb 1998	--	0.003	0.026	--	2.1
	Apr/May 1998	--	--	--	--	1.4
	Jul/Aug 1998	--	--	--	--	3.1
Screen 4	Aug/Sep 1996	--	--	--	--	3.1
	Oct/Nov 1996	--	--	--	--	2.5
	Feb/Mar 1997	--	--	--	--	4.1
	Jun/Jul 1997	--	--	--	--	2.3
	Sep/Oct 1997	--	--	--	--	1.7
	Jan/Feb 1998	--	0.002	--	--	2.7
	Apr/May 1998	--	--	--	--	1.3
	Jul/Aug 1998	--	--	--	--	1.0
Screen 5	Aug/Sep 1996	--	--	--	--	1.5
	Oct/Nov 1996	--	--	--	--	4.1
	Feb/Mar 1997	--	0.028	--	--	2.3
	Jun/Jul 1997	--	--	--	--	1.9
	Sep/Oct 1997	--	--	--	--	3.8
	Jan/Feb 1998	--	--	--	--	4.7
	Apr/May 1998	--	--	--	--	1.9
	Jul/Aug 1998	--	--	--	--	2.4
MW-15	Aug/Sep 1996	--	--	--	--	1.3
	Oct/Nov 1996	--	--	NA	--	0.5
	Feb/Mar 1997	--	--	--	--	2.6
	Jun/Jul 1997	--	--	--	--	0.2
	Sep/Oct 1997	--	--	--	--	0.9
	Jan/Feb 1998	--	--	--	--	1.4
	Apr/May 1998	--	--	--	--	0.4
	Jul/Aug 1998	--	--	--	--	3.0
MW-16	Aug/Sep 1996	--	--	0.018	--	3.4
	Oct/Nov 1996	Not Sampled*				
	Feb/Mar 1997	--	--	--	0.007	0.2
	Jun/Jul 1997	--	--	--	--	0.1
	Sep/Oct 1997	Not Sampled*				
	Jan/Feb 1998	--	--	--	--	1.1
	Apr/May 1998	--	--	0.014	--	1.4
	Jul/Aug 1998	--	--	--	--	1.9

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE 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-17						
Screen 1	Aug/Sep 1996	--	--	NA	NA	1.0
	Oct/Nov 1996	--	--	--	--	2.9
	Feb/Mar 1997	--	--	--	--	2.0
	Jun/Jul 1997	--	--	--	--	2.2
	Sep/Oct 1997	--	--	--	--	1.3
	Jan/Feb 1998	--	--	--	--	5.0
	Apr/May 1998	--	--	--	--	1.7
	Jul/Aug 1998	--	--	--	--	1.5
Screen 2	Aug/Sep 1996	--	--	NA	NA	4.5
	Oct/Nov 1996	--	--	--	--	2.5
	Feb/Mar 1997	--	--	--	--	2.7
	Jun/Jul 1997	--	--	--	--	4.5
	Sep/Oct 1997	--	--	--	--	1.2
	Jan/Feb 1998	--	--	--	--	0.8
	Apr/May 1998	--	--	--	--	2.2
	Jul/Aug 1998	--	0.007	--	--	1.0
Screen 3	Aug/Sep 1996	--	0.002	NA	NA	4.9
	Oct/Nov 1996	--	--	--	--	4.8
	Feb/Mar 1997	--	--	--	--	6.0
	Jun/Jul 1997	--	--	--	--	4.8
	Sep/Oct 1997	--	--	--	0.006	2.5
	Jan/Feb 1998	--	--	--	--	3.2
	Apr/May 1998	--	--	--	--	3.6
	Jul/Aug 1998	--	--	--	--	4.0
Screen 4	Aug/Sep 1996	--	--	NA	NA	2.8
	Oct/Nov 1996	--	--	--	--	2.6
	Feb/Mar 1997	--	--	--	--	5.6
	Jun/Jul 1997	--	--	--	--	4.1
	Sep/Oct 1997	--	--	--	--	3.6
	Jan/Feb 1998	--	--	--	--	3.9
	Apr/May 1998	--	--	--	--	3.7
	Jul/Aug 1998	--	--	--	--	4.4
Screen 5	Aug/Sep 1996	--	--	NA	NA	5.0
	Oct/Nov 1996	--	0.005	--	--	5.2
	Feb/Mar 1997	--	0.003	--	--	25
	Jun/Jul 1997	--	--	--	--	34
	Sep/Oct 1997	--	--	--	--	4.8
	Jan/Feb 1998	--	--	--	--	4.8
	Apr/May 1998	--	0.002	--	--	3.7
	Jul/Aug 1998	--	--	--	--	4.8

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE 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
	Oct/Nov 1996	Not Sampled*				
	Feb/Mar 1997	--	--	--	--	1.9
	Jun/Jul 1997	--	--	--	--	0.4
	Sep/Oct 1997	Not Sampled*				
	Jan/Feb 1998	Not Sampled*				
	Apr/May 1998	--	--	--	--	0.1
	Jul/Aug 1998	--	--	--	--	3.8
Screen 2	Aug/Sep 1996	--	--	NA	NA	3.5
	Oct/Nov 1996	--	0.003	--	--	3.4
	Feb/Mar 1997	--	--	--	--	2.8
	Jun/Jul 1997	--	--	--	--	1.5
	Sep/Oct 1997	--	--	--	--	1.4
	Jan/Feb 1998	--	--	--	--	3.6
	Apr/May 1998	--	--	--	--	0.1
	Jul/Aug 1998	--	--	--	--	3.1
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	--	--	--	--	3.9
	Sep/Oct 1997	--	--	--	--	2.1
	Jan/Feb 1998	--	--	--	--	0.6
	Apr/May 1998	--	--	0.012	0.007	0.04
	Jul/Aug 1998	--	--	0.014	--	2.3
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	--	--	--	3.6
	Sep/Oct 1997	--	--	--	--	1.1
	Jan/Feb 1998	--	--	--	--	2.2
	Apr/May 1998	--	--	--	--	0.04
	Jul/Aug 1998	--	--	--	--	2.5
Screen 5	Aug/Sep 1996	--	--	NA	NA	2.8
	Oct/Nov 1996	--	0.002	--	--	3.6
	Feb/Mar 1997	--	--	--	--	2.9
	Jun/Jul 1997	--	--	--	--	4.0
	Sep/Oct 1997	--	--	--	--	1.7
	Jan/Feb 1998	--	--	--	--	1.6
	Apr/May 1998	--	--	--	--	0.1
	Jul/Aug 1998	--	--	--	--	1.1

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE 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-19						
Screen 1	Aug/Sep 1996	--	--	NA	NA	5.0
	Oct/Nov 1996	--	--	--	--	3.4
	Feb/Mar 1997	--	--	--	--	6.6
	Jun/Jul 1997	--	--	--	--	0.8
	Sep/Oct 1997	--	--	--	--	4.6
	Jan/Feb 1998	--	--	--	--	4.7
	Apr/May 1998	--	--	--	--	2.2
	Jul/Aug 1998	--	--	--	--	4.9
Screen 2	Aug/Sep 1996	--	--	NA	NA	4.5
	Oct/Nov 1996	--	--	--	--	3.6
	Feb/Mar 1997	--	--	--	--	22
	Jun/Jul 1997	--	--	--	--	2.8
	Sep/Oct 1997	--	--	--	--	4.6
	Jan/Feb 1998	--	--	--	--	4.7
	Apr/May 1998	--	--	--	--	2.3
	Jul/Aug 1998	--	--	--	--	4.9
Screen 3	Aug/Sep 1996	--	--	NA	NA	3.0
	Oct/Nov 1996	--	--	--	--	5.0
	Feb/Mar 1997	--	--	--	--	4.9
	Jun/Jul 1997	--	--	--	--	4.9
	Sep/Oct 1997	--	--	--	--	2.0
	Jan/Feb 1998	--	--	--	--	4.1
	Apr/May 1998	--	--	--	--	2.4
	Jul/Aug 1998	--	--	--	--	3.9
Screen 4	Aug/Sep 1996	--	--	NA	NA	4.2
	Oct/Nov 1996	--	--	--	--	8.0
	Feb/Mar 1997	--	0.003	--	--	16
	Jun/Jul 1997	--	--	--	--	4.9
	Sep/Oct 1997	--	--	--	--	4.8
	Jan/Feb 1998	--	--	--	--	4.8
	Apr/May 1998	--	--	--	--	4.8
	Jul/Aug 1998	--	--	--	--	4.6
Screen 5	Aug/Sep 1996	--	--	NA	NA	4.9
	Oct/Nov 1996	--	--	NA	--	4.6
	Feb/Mar 1997	--	--	--	--	3.8
	Jun/Jul 1997	--	--	--	--	2.2
	Sep/Oct 1997	--	--	--	--	5.0
	Jan/Feb 1998	--	--	--	--	4.0
	Apr/May 1998	--	--	--	--	4.6
	Jul/Aug 1998	--	0.010	--	--	4.8

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE 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-20						
Screen 1	Aug/Sep 1996	--	--	--	NA	3.5
	Oct/Nov 1996	Not Sampled*				
	Feb/Mar 1997	--	--	--	--	2.3
	Jun/Jul 1997	--	--	--	--	0.2
	Sep/Oct 1997	Not Sampled*				
	Jan/Feb 1998	--	--	--	--	3.2
	Apr/May 1998	--	--	--	--	2.9
	Jul/Aug 1998	--	--	--	--	3.2
Screen 2	Aug/Sep 1996	--	--	NA	NA	3.9
	Oct/Nov 1996	--	--	--	--	1.1
	Feb/Mar 1997	--	--	--	--	2.1
	Jun/Jul 1997	--	--	--	--	2.5
	Sep/Oct 1997	--	--	--	--	3.6
	Jan/Feb 1998	--	--	--	--	0.4
	Apr/May 1998	--	--	--	--	1.4
	Jul/Aug 1998	--	--	--	--	1.3
Screen 3	Aug/Sep 1996	--	--	NA	NA	1.7
	Oct/Nov 1996	--	--	--	--	1.6
	Feb/Mar 1997	--	--	--	--	1.9
	Jun/Jul 1997	--	--	--	--	2.1
	Sep/Oct 1997	--	--	--	--	4.6
	Jan/Feb 1998	--	--	--	--	2.2
	Apr/May 1998	--	--	--	--	1.3
	Jul/Aug 1998	--	--	--	--	0.7
Screen 4	Aug/Sep 1996	--	--	NA	NA	1.0
	Oct/Nov 1996	--	--	--	--	1.3
	Feb/Mar 1997	--	--	--	--	3.3
	Jun/Jul 1997	--	--	--	--	1.3
	Sep/Oct 1997	--	--	--	--	1.4
	Jan/Feb 1998	--	--	--	--	0.6
	Apr/May 1998	--	--	--	--	1.7
	Jul/Aug 1998	--	--	--	--	2.1
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	--	--	--	1.9
	Sep/Oct 1997	--	--	--	--	3.5
	Jan/Feb 1998	--	--	--	--	0.1
	Apr/May 1998	--	--	--	--	1.1
	Jul/Aug 1998	--	--	--	--	3.3

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE 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-21						
Screen 1	Aug/Sep 1996	--	--	NA	NA	0.9
	Oct/Nov 1996	Not Sampled*				
	Feb/Mar 1997	--	--	--	--	1.1
	Jun/Jul 1997	--	--	--	--	2.8
	Sep/Oct 1997	Not Sampled*				
	Jan/Feb 1998	--	--	--	--	0.8
	Apr/May 1998	--	--	--	--	0.7
	Jul/Aug 1998	--	--	--	--	3.4
Screen 2	Aug/Sep 1996	--	--	NA	NA	2.1
	Oct/Nov 1996	--	--	--	--	1.2
	Feb/Mar 1997	--	--	--	--	3.9
	Jun/Jul 1997	--	--	--	--	1.7
	Sep/Oct 1997	--	--	--	--	0.8
	Jan/Feb 1998	--	--	--	--	0.6
	Apr/May 1998	--	--	--	--	1.8
	Jul/Aug 1998	--	--	--	--	3.9
Screen 3	Aug/Sep 1996	--	--	NA	NA	4.6
	Oct/Nov 1996	--	--	--	--	4.9
	Feb/Mar 1997	--	0.003	--	--	4.6
	Jun/Jul 1997	--	--	--	--	1.4
	Sep/Oct 1997	--	--	--	--	3.2
	Jan/Feb 1998	--	0.003	--	--	4.8
	Apr/May 1998	--	--	--	--	4.1
	Jul/Aug 1998	--	--	--	--	4.8
Screen 4	Aug/Sep 1996	--	--	NA	NA	2.5
	Oct/Nov 1996	--	--	--	--	3.3
	Feb/Mar 1997	--	0.004	--	--	4.4
	Jun/Jul 1997	--	--	--	--	2.5
	Sep/Oct 1997	--	--	--	--	4.5
	Jan/Feb 1998	--	--	--	--	1.1
	Apr/May 1998	--	--	--	--	4.6
	Jul/Aug 1998	--	--	--	--	2.4
Screen 5	Aug/Sep 1996	--	--	NA	NA	4.9
	Oct/Nov 1996	--	--	--	--	5.0
	Feb/Mar 1997	--	--	--	--	28
	Jun/Jul 1997	--	--	--	--	26
	Sep/Oct 1997	--	--	--	--	12
	Jan/Feb 1998	--	--	--	--	4.9
	Apr/May 1998	--	--	--	--	4.6
	Jul/Aug 1998	--	--	--	--	4.2

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE 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-22[1]						
Screen 1	Sep/Oct 1997	--	--	--	--	34
	Jan/Feb 1998	--	--	--	--	4.5
	Apr/May 1998	--	--	--	--	4.6
	Jul/Aug 1998	--	--	--	--	4.8
Screen 2	Sep/Oct 1997	--	--	--	--	4.9
	Jan/Feb 1998	--	--	--	--	4.2
	Apr/May 1998	--	--	--	--	4.7
	Jul/Aug 1998	--	--	--	--	4.4
Screen 3	Sep/Oct 1997	--	--	--	--	3.0
	Jan/Feb 1998	--	--	--	--	3.8
	Apr/May 1998	--	--	--	--	2.9
	Jul/Aug 1998	--	--	--	--	4.9
Screen 4	Sep/Oct 1997	--	--	--	--	2.8
	Jan/Feb 1998	--	--	--	--	3.7
	Apr/May 1998	--	--	--	--	3.0
	Jul/Aug 1998	--	--	--	--	4.0
Screen 5	Sep/Oct 1997	--	--	--	--	4.4
	Jan/Feb 1998	--	--	--	--	2.8
	Apr/May 1998	--	--	--	--	2.9
	Jul/Aug 1998	--	--	--	--	2.3
MW-23[1]						
Screen 1	Sep/Oct 1997	--	--	--	--	3.4
	Jan/Feb 1998	--	--	--	--	4.1
	Apr/May 1998	--	--	--	--	4.5
	Jul/Aug 1998	--	--	--	--	4.0
Screen 2	Sep/Oct 1997	--	--	--	--	4.9
	Jan/Feb 1998	--	--	--	--	4.9
	Apr/May 1998	--	--	--	--	4.7
	Jul/Aug 1998	--	--	--	--	3.4
Screen 3	Sep/Oct 1997	--	--	--	--	3.0
	Jan/Feb 1998	--	--	--	--	4.6
	Apr/May 1998	--	--	--	--	4.6
	Jul/Aug 1998	--	--	--	--	4.7
Screen 4	Sep/Oct 1997	--	--	--	--	4.9
	Jan/Feb 1998	--	--	--	--	4.5
	Apr/May 1998	--	--	--	--	4.9
	Jul/Aug 1998	--	--	--	--	4.6
Screen 5	Sep/Oct 1997	--	--	--	--	1.8
	Jan/Feb 1998	--	--	--	--	1.8
	Apr/May 1998	--	--	--	--	2.4
	Jul/Aug 1998	--	--	--	--	1.7

TABLE 3-6

SUMMARY OF METALS DETECTED DURING THE 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-24[1]						
Screen 1	Sep/Oct 1997	--	--	--	--	1.6
	Jan/Feb 1998	--	--	--	--	3.8
	Apr/May 1998	--	--	--	--	2.7
	Jul/Aug 1998	--	--	--	--	4.9
Screen 2	Sep/Oct 1997	--	--	--	--	4.4
	Jan/Feb 1998	--	--	--	--	4.9
	Apr/May 1998	--	--	--	--	4.5
	Jul/Aug 1998	--	--	--	--	4.8
Screen 3	Sep/Oct 1997	--	--	--	--	4.6
	Jan/Feb 1998	0.006	--	--	--	4.7
	Apr/May 1998	--	--	--	--	4.9
	Jul/Aug 1998	--	--	--	--	4.9
Screen 4	Sep/Oct 1997	--	--	--	--	4.0
	Jan/Feb 1998	--	--	--	--	4.9
	Apr/May 1998	--	--	--	--	4.3
	Jul/Aug 1998	--	--	--	--	4.8
Screen 5	Sep/Oct 1997	--	--	--	--	4.8
	Jan/Feb 1998	--	--	--	--	4.8
	Apr/May 1998	--	--	--	--	4.0
	Jul/Aug 1998	--	--	--	--	4.0
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.
*: Not sampled, no water over screen.
a: Treatment technique and public notification triggered at 0.015 mg/L.
--: Not detected.

TABLE 4-1

SUMMARY OF WATER-CHEMISTRY RESULTS FOR GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, JULY-AUGUST 1998

(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	21	0.40	244	0.98	45	29	19	4.2	60	0.78	200	7.4
MW-3												
Screen 1	5.1	0.29	177	0.71	26	19	14	3.2	41	0.55	145	7.4
Screen 2	14	0.46	226	0.83	34	21	19	3.5	57	0.22	185	7.5
Screen 3	24	2.8	170	0.15	20	42	12	3.6	21	0.27	140	8.4
Screen 4	11	1.9	182	0.20	13	49	8.6	2.4	20	0.29	150	8.2
Screen 5	9.6	8.0	155	--	6.3	73	0.83	1.4	3.8	0.36	130	8.9
MW-4												
Screen 1	5.2	0.19	183	1.4	27	20	15	3.3	45	--	150	7.2
Screen 2	78	0.12	189	8.7	85	30	31	3.5	89	3.3	155	7.0
Screen 3	23	1.8	170	6.4	11	36	15	2.6	34	--	140	8.2
Screen 4	15	1.2	189	4.4	7.3	43	11	2.4	33	0.10	155	8.0
Screen 5	8.8	1.1	207	1.2	18	38	10	2.5	38	1.0	170	7.9
MW-5	4.1	0.08	146	0.37	16	13	11	3.1	34	0.73	120	6.9
MW-6	100	0.13	244	9.7	140	33	43	3.6	130	0.12	200	6.9
MW-7	22	0.22	171	5.2	48	20	19	3.5	57	2.6	140	7.3
MW-8	6.4	0.15	177	0.87	28	16	15	3.0	45	--	145	7.1
MW-9	4.7	0.16	195	2.7	21	20	14	3.4	46	0.16	160	7.1
MW-10	8.7	0.10	195	4.6	33	16	19	3.3	57	--	160	6.9
MW-11												
Screen 1	19	1.0	244	0.85	44	27	22	4.6	60	--	200	7.8
Screen 2	15	1.1	207	0.60	37	24	19	4.1	51	0.27	170	7.9
Screen 3	13	1.4	207	0.34	27	27	15	3.2	50	0.11	170	8.0
Screen 4	11	2.0	194	--	21	26	14	3.2	40	0.70	160	8.2
Screen 5	12	1.6	158	--	18	50	2.4	1.7	24	0.13	130	8.2
MW-12												
Screen 1	8.6	0.28	219	0.99	39	24	20	4.1	53	1.3	180	7.3
Screen 2	16	0.57	219	1.9	43	26	19	3.9	61	0.23	180	7.6
Screen 3	19	0.95	231	1.7	40	26	18	3.7	65	0.31	190	7.8
Screen 4	14	0.92	225	1.5	31	26	15	3.1	60	0.13	185	7.8
Screen 5	14	1.1	213	1.2	21	37	13	2.7	47	--	175	7.9
MW-13	26	0.12	189	10	62	30	22	3.5	66	--	155	7.0
MW-14												
Screen 1	130	0.13	256	20	200	45	50	4.2	150	1.5	210	6.9
Screen 2	120	0.20	305	17	190	35	54	4.0	150	0.80	250	7.0
Screen 3	91	1.7	164	6.3	100	40	40	4.3	57	--	135	8.2
Screen 4	32	1.8	176	9.8	20	29	19	2.7	46	0.29	145	8.2
Screen 5	9.0	3.5	169	0.10	17	37	12	2.7	19	0.18	140	8.5

TABLE 4-1

SUMMARY OF WATER-CHEMISTRY RESULTS FOR GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, JULY-AUGUST 1998

(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	9.6	0.22	171	1.4	22	19	13	3.1	40	--	140	7.3
MW-16	21	0.10	159	13	45	28	21	3.2	54	--	130	7.0
MW-17												
Screen 1	4.4	0.21	159	0.53	21	13	11	2.1	34	--	130	7.3
Screen 2	6.4	9.2	142	0.40	25	17	20	3.0	18	0.69	120	9.0
Screen 3	9.1	0.60	183	0.90	29	20	17	2.9	43	0.13	150	7.7
Screen 4	13	0.90	219	2.8	31	28	14	1.7	49	0.36	180	7.8
Screen 5	13	1.4	207	2.6	31	29	14	1.7	47	0.75	170	8.0
MW-18												
Screen 1	11	0.18	177	1.9	42	15	15	2.5	45	0.14	145	7.2
Screen 2	9.9	0.31	195	0.96	36	19	16	2.9	48	0.18	160	7.4
Screen 3	15	1.3	256	0.81	38	22	20	3.6	60	--	210	7.9
Screen 4	9.0	1.4	207	0.78	23	33	11	1.8	39	0.49	170	8.0
Screen 5	10	10	154	--	4.6	56	5.1	2.0	8.0	0.13	130	9.0
MW-19												
Screen 1	4.3	0.19	146	0.40	19	13	11	2.6	34	0.67	120	7.3
Screen 2	42	0.10	232	5.7	70	20	30	2.9	79	0.38	190	6.8
Screen 3	94	0.22	274	10	87	34	40	3.8	110	0.95	225	7.1
Screen 4	29	0.49	238	4.1	44	26	24	2.8	66	0.36	195	7.5
Screen 5	70	1.2	280	8.4	67	32	32	2.9	88	0.35	230	7.8
MW-20												
Screen 1	48	0.40	195	11	120	24	31	4.5	94	0.14	160	7.5
Screen 2	15	1.2	183	2.7	33	19	19	2.6	43	--	150	8.0
Screen 3	28	2.4	231	2.1	22	60	15	2.6	33	--	190	8.2
Screen 4	10	5.1	156	--	17	66	3.1	1.1	11	0.10	130	8.7
Screen 5	8.3	8.6	167	--	21	70	3.1	1.8	11	--	140	8.9
MW-21												
Screen 1	66	0.05	201	15	110	32	32	3.0	98	0.11	165	6.6
Screen 2	120	0.14	268	11	160	48	44	4.2	130	0.91	220	6.9
Screen 3	100	0.51	311	9.0	95	43	38	4.2	120	0.41	255	7.4
Screen 4	87	0.26	256	11	96	34	37	3.8	120	0.10	210	7.2
Screen 5	67	1.0	244	9.7	82	35	33	3.6	87	1.2	200	7.8
MW-22												
Screen 1	120	1.3	305	10	160	35	53	4.3	140	0.29	250	7.8
Screen 2	58	1.0	195	9.8	57	34	29	3.4	70	0.34	160	7.9
Screen 3	31	1.4	176	8.6	23	37	17	2.8	45	0.33	145	8.1
Screen 4	12	0.85	164	4.3	7.1	29	11	2.2	34	0.24	135	7.9
Screen 5	8.8	8.5	130	--	49	81	1.5	1.5	6.2	0.24	110	9.0

TABLE 4-1

SUMMARY OF WATER-CHEMISTRY RESULTS FOR GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, JULY-AUGUST 1998

(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	33	0.08	122	5.3	72	27	24	2.6	65	1.0	100	7.0
Screen 2	115	0.27	262	15	170	37	49	4.1	140	0.46	215	7.2
Screen 3	24	0.53	164	9.3	13	29	15	2.3	45	0.60	135	7.7
Screen 4	14	0.65	158	6.0	6.2	29	12	2.1	33	0.13	130	7.8
Screen 5	33	35	217	--	33	120	1.5	3.1	5.4	--	190	9.4
MW-24												
Screen 1	9.3	0.38	183	1.4	32	17	16	3.1	49	0.47	150	7.5
Screen 2	29	2.1	158	3.0	14	44	11	3.3	26	0.84	130	8.3
Screen 3	28	0.82	201	2.2	18	42	14	2.7	40	1.7	165	7.8
Screen 4	13	1.9	188	3.1	8.4	43	11	2.5	27	0.57	155	8.2
Screen 5	9.4	0.85	207	1.1	22	43	10	2.5	40	0.35	170	7.8
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

TABLE 4-2

GENERAL WATER TYPES OBSERVED DURING THE JULY-AUGUST 1998 SAMPLING EVENT (AS INTERPRETED WITH STIFF DIAGRAMS)

Well/Screen Number	Water Type
MW-1	Type 1
MW-3	
Screen 1	Type 1
Screen 2	Type 1
Screen 3	Type 2
Screen 4	Type 2
Screen 5	Type 2
MW-4	
Screen 1	Type 1
Screen 2	Type 3/1
Screen 3	Type 1/2/3
Screen 4	Type 2/1
Screen 5	Type 1/2
MW-5	Type 1
MW-6	Type 3/1
MW-7	Type 1
MW-8	Type 1
MW-9	Type 1
MW-10	Type 1
MW-11	
Screen 1	Type 1
Screen 2	Type 1
Screen 3	Type 1
Screen 4	Type 1
Screen 5	Type 2
MW-12	
Screen 1	Type 1
Screen 2	Type 1
Screen 3	Type 1
Screen 4	Type 1
Screen 5	Type 1/2
MW-13	Type 1/3
MW-14	
Screen 1	Type 3
Screen 2	Type 3
Screen 3	Type 1/3
Screen 4	Type 1/3
Screen 5	Type 2
MW-15	Type 1
MW-16	Type 1/3
MW-17	
Screen 1	Type 1
Screen 2	Type 1
Screen 3	Type 1
Screen 4	Type 1/2
Screen 5	Type 1/2
MW-18	
Screen 1	Type 1
Screen 2	Type 1
Screen 3	Type 1
Screen 4	Type 1/2
Screen 5	Type 2
MW-19	
Screen 1	Type 1
Screen 2	Type 3/1
Screen 3	Type 3/1
Screen 4	Type 1/3
Screen 5	Type 1/3
MW-20	
Screen 1	Type 3
Screen 2	Type 1
Screen 3	Type 2
Screen 4	Type 2
Screen 5	Type 2
MW-21	
Screen 1	Type 1/3
Screen 2	Type 1/3
Screen 3	Type 1/3
Screen 4	Type 1/3
Screen 5	Type 1/3
MW-22	
Screen 1	Type 3
Screen 2	Type 1/3
Screen 3	Type 1/2/3
Screen 4	Type 1/2/3
Screen 5	Type 2
MW-23	
Screen 1	Type 1/3
Screen 2	Type 3
Screen 3	Type 1/2/3
Screen 4	Type 1/2
Screen 5	Type 2
MW-24	
Screen 1	Type 1
Screen 2	Type 2/3
Screen 3	Type 2/3
Screen 4	Type 2/3
Screen 5	Type 1/2

1: General Water Types:
Type 1: Calcium-bicarbonate groundwater
Type 2: Sodium-bicarbonate groundwater
Type 3: Calcium-bicarbonate/chloride/sulfate/nitrate groundwater

TABLE 4-3

SUMMARY OF QUALITY CONTROL ANALYSES OF WATER-CHEMISTRY DATA FROM GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, JULY-AUGUST 1998

(ion concentrations are meq/L; TDS concentrations are mg/L)

Well Number	Total Anions	Total Cations	Total Ions	Charge Balance	Measured TDS	Calculated TDS	Measured TDS/ Calculated TDS
MW-1	5.5	5.9	11.4	3.51	300	300	1.0
MW-3							
Screen 1	3.6	4.1	7.7	6.49	210	197	1.1
Screen 2	4.9	5.4	10.3	4.85	270	261	1.0
Screen 3	3.9	4.0	7.9	1.26	220	209	1.1
Screen 4	3.6	3.9	7.5	4.00	200	196	1.0
Screen 5	3.0	3.5	6.5	7.69	210	179	1.2
MW-4							
Screen 1	3.8	4.4	8.2	7.32	230	207	1.1
Screen 2	7.7	8.4	16.1	4.35	470	422	1.1
Screen 3	4.1	4.6	8.7	5.75	240	213	1.1
Screen 4	4.0	4.5	8.5	5.88	240	210	1.1
Screen 5	4.1	4.4	8.5	3.53	250	220	1.1
MW-5	2.9	3.3	6.2	6.45	180	154	1.2
MW-6	10.4	11.6	22.0	5.45	680	579	1.2
MW-7	4.7	5.4	10.1	6.93	300	262	1.1
MW-8	3.7	4.3	8.0	7.50	220	201	1.1
MW-9	4.0	4.4	8.4	4.76	240	208	1.2
MW-10	4.5	5.2	9.7	7.22	280	237	1.2
MW-11							
Screen 1	5.5	6.1	11.6	5.17	310	298	1.0
Screen 2	4.6	5.3	9.9	7.07	270	254	1.1
Screen 3	4.4	5.0	9.4	6.38	240	239	1.0
Screen 4	4.0	4.4	8.4	4.76	230	213	1.1
Screen 5	3.3	3.6	6.9	4.35	200	188	1.1
MW-12							
Screen 1	4.7	5.4	10.1	6.93	300	259	1.2
Screen 2	5.0	5.8	10.8	7.41	320	279	1.1
Screen 3	5.2	6.0	11.2	7.14	330	288	1.1
Screen 4	4.8	5.4	10.2	5.88	290	262	1.1
Screen 5	4.3	5.1	9.4	8.51	260	241	1.1
MW-13	5.8	6.5	12.3	5.69	390	313	1.2
MW-14							
Screen 1	13.5	13.7	27.2	0.74	820	726	1.1
Screen 2	13.6	13.6	27.2	0.01	830	721	1.2
Screen 3	7.8	8.0	15.8	1.26	460	421	1.1
Screen 4	4.9	5.2	10.1	2.97	290	248	1.2
Screen 5	3.4	3.6	7.0	2.86	200	184	1.1

TABLE 4-3

SUMMARY OF QUALITY CONTROL ANALYSES OF WATER-CHEMISTRY DATA FROM GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, JULY-AUGUST 1998

(ion concentrations are meq/L; TDS concentrations are mg/L)

Well Number	Total Anions	Total Cations	Total Ions	Charge Balance	Measured TDS	Calculated TDS	Measured TDS/ Calculated TDS
MW-15	3.5	4.0	7.5	6.67	210	192	1.1
MW-16	5.1	5.7	10.8	5.56	350	263	1.3
MW-17							
Screen 1	3.2	3.2	6.4	0.01	190	164	1.2
Screen 2	3.1	3.4	6.5	4.61	190	170	1.1
Screen 3	3.9	4.5	8.4	7.14	240	213	1.1
Screen 4	4.8	4.9	9.7	1.03	270	248	1.1
Screen 5	4.6	4.8	9.4	2.12	280	242	1.2
MW-18							
Screen 1	4.2	4.2	8.4	0.01	280	219	1.3
Screen 2	4.3	4.6	8.9	3.37	260	229	1.1
Screen 3	5.5	5.7	11.2	1.78	320	286	1.1
Screen 4	4.2	4.3	8.5	1.18	240	221	1.1
Screen 5	3.0	3.3	6.3	4.76	210	172	1.2
MW-19							
Screen 1	3.0	3.2	6.2	3.20	200	157	1.3
Screen 2	6.9	7.4	14.3	3.49	440	364	1.2
Screen 3	9.7	10.4	20.1	3.48	570	515	1.1
Screen 4	5.9	6.5	12.4	4.84	350	314	1.1
Screen 5	8.6	8.5	17.1	0.58	500	440	1.1
MW-20							
Screen 1	7.8	8.4	16.2	3.70	510	429	1.2
Screen 2	4.3	4.6	8.9	3.37	270	225	1.2
Screen 3	5.2	5.6	10.8	3.70	350	279	1.3
Screen 4	3.2	3.7	6.9	7.25	230	190	1.2
Screen 5	3.5	3.9	7.4	5.41	220	206	1.1
MW-21							
Screen 1	8.4	9.0	17.4	3.45	530	455	1.2
Screen 2	11.8	12.3	24.1	2.07	740	650	1.1
Screen 3	10.3	11.1	21.4	3.74	630	563	1.1
Screen 4	9.7	10.6	20.3	4.43	590	515	1.1
Screen 5	8.1	8.7	16.8	3.57	580	439	1.3
MW-22							
Screen 1	12.4	13.0	25.4	2.36	750	673	1.1
Screen 2	6.7	7.5	14.2	5.63	460	358	1.3
Screen 3	4.9	5.3	10.2	3.92	310	253	1.2
Screen 4	3.5	3.9	7.4	5.41	220	181	1.2
Screen 5	3.5	4.0	7.5	6.67	250	221	1.1

TABLE 4-3

SUMMARY OF QUALITY CONTROL ANALYSES OF WATER-CHEMISTRY DATA FROM GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, JULY-AUGUST 1998

(ion concentrations are meq/L; TDS concentrations are mg/L)

Well Number	Total Anions	Total Cations	Total Ions	Charge Balance	Measured TDS	Calculated TDS	Measured TDS/ Calculated TDS
MW-23							
Screen 1	4.8	6.5	11.3	6.19	370	290	1.3
Screen 2	12.2	12.7	24.9	2.00	640	660	1.0
Screen 3	4.3	4.8	9.1	5.49	260	219	1.2
Screen 4	3.6	4.0	7.6	5.26	220	181	1.2
Screen 5	5.4	5.7	11.1	2.70	340	338	1.0
MW-24							
Screen 1	4.0	4.6	8.6	6.97	250	219	1.1
Screen 2	3.8	4.2	8.0	5.00	250	210	1.2
Screen 3	4.5	5.1	9.6	6.25	320	247	1.3
Screen 4	3.8	4.2	8.0	5.00	240	202	1.2
Screen 5	4.2	4.8	9.0	6.67	270	231	1.2

TABLE 5-1

GROUNDWATER MONITORING WELL WATER-LEVEL MEASUREMENTS, JULY 15, 1998

Well Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-1	7/15/98	22.69	1116.69	1094.00
MW-3				
Screen 1 (top)	7/15/98	89.75	1100.34	1010.59
Screen 2	7/15/98	103.07	1100.34	997.27
Screen 3	7/15/98	109.25	1100.34	991.09
Screen 4	7/15/98	190.40	1100.34	909.94
Screen 5	7/15/98	221.07	1100.34	879.27
MW-4				
Screen 1 (top)	7/15/98	62.16	1082.84	1020.68
Screen 2	7/15/98	83.45	1082.84	999.39
Screen 3	7/15/98	88.65	1082.84	994.19
Screen 4	7/15/98	98.94	1082.84	983.90
Screen 5	7/15/98	177.58	1082.84	905.26
MW-5	7/15/98	50.08	1071.62	1021.54
MW-6	7/15/98	177.56	1188.54	1010.98
MW-7	7/15/98	195.71	1212.90	1017.19
MW-8	7/15/98	120.38	1139.55	1019.17
MW-9	7/15/98	19.51	1106.06	1086.55
MW-10	7/15/98	71.32	1087.73	1016.41
MW-11				
Screen 1 (top)	7/15/98	102.12	1139.30	1037.18
Screen 2	7/15/98	128.93	1139.30	1010.37
Screen 3	7/15/98	147.74	1139.30	991.56
Screen 4	7/15/98	159.25	1139.30	980.05
Screen 5	7/15/98	216.66	1139.30	922.64
MW-12				
Screen 1 (top)	7/15/98	78.83	1102.14	1023.31
Screen 2	7/15/98	99.26	1102.14	1002.88
Screen 3	7/15/98	104.55	1102.14	997.59
Screen 4	7/15/98	121.22	1102.14	980.92
Screen 5	7/15/98	184.13	1102.14	918.01
MW-13	7/15/98	167.93	1183.49	1015.56

TABLE 5-1

GROUNDWATER MONITORING WELL WATER-LEVEL MEASUREMENTS, JULY 15, 1998

Well Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-14				
Screen 1 (top)	7/15/98	162.36	1173.47	1011.11
Screen 2	7/15/98	163.49	1173.47	1009.98
Screen 3	7/15/98	164.54	1173.47	1008.93
Screen 4	7/15/98	164.89	1173.47	1008.58
Screen 5	7/15/98	166.32	1173.47	1007.15
MW-15	7/15/98	29.25	1120.68	1091.43
MW-16	7/15/98	220.79	1236.29	1015.50
MW-17				
Screen 1 (top)	7/15/98	175.84	1191.21	1015.37
Screen 2	7/15/98	200.34	1191.21	990.87
Screen 3	7/15/98	217.04	1191.21	974.17
Screen 4	7/15/98	271.30	1191.21	919.91
Screen 5	7/15/98	282.35	1191.21	908.86
MW-18				
Screen 1 (top)	7/15/98	228.66	1225.41	996.75
Screen 2	7/15/98	230.67	1225.41	994.74
Screen 3	7/15/98	236.25	1225.41	989.16
Screen 4	7/15/98	269.49	1225.41	955.92
Screen 5	7/15/98	287.86	1225.41	937.55
MW-19				
Screen 1 (top)	7/15/98	141.72	1142.94	1001.22
Screen 2	7/15/98	166.00	1142.94	976.94
Screen 3	7/15/98	173.28	1142.94	969.66
Screen 4	7/15/98	272.25	1142.94	870.69
Screen 5	7/15/98	275.59	1142.94	867.35
MW-20				
Screen 1 (top)	7/15/98	193.74	1165.05	971.31
Screen 2	7/15/98	192.67	1165.05	972.38
Screen 3	7/15/98	215.47	1165.05	949.58
Screen 4	7/15/98	227.30	1165.05	937.75
Screen 5	7/15/98	190.67	1165.05	974.38

TABLE 5-1

GROUNDWATER MONITORING WELL WATER-LEVEL MEASUREMENTS, JULY 15, 1998

Well Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-21				
Screen 1 (top)	7/15/98	47.41	1059.10	1011.69
Screen 2	7/15/98	48.32	1059.10	1010.78
Screen 3	7/15/98	49.86	1059.10	1009.24
Screen 4	7/15/98	51.70	1059.10	1007.40
Screen 5	7/15/98	51.84	1059.10	1007.26
MW-22				
Screen 1 (top)	7/15/98	164.13	1176.98	1012.85
Screen 2	7/15/98	170.55	1176.98	1006.43
Screen 3	7/15/98	170.97	1176.98	1006.01
Screen 4	7/15/98	189.25	1176.98	987.73
Screen 5	7/15/98	200.23	1176.98	976.75
MW-23				
Screen 1 (top)	7/15/98	94.57	1108.84	1014.27
Screen 2	7/15/98	104.45	1108.84	1004.39
Screen 3	7/15/98	106.13	1108.84	1002.71
Screen 4	7/15/98	129.76	1108.84	979.08
Screen 5	7/15/98	130.38	1108.84	978.46
MW-24				
Screen 1 (top)	7/15/98	184.24	1200.94	1016.70
Screen 2	7/15/98	196.26	1200.94	1004.68
Screen 3	7/15/98	201.35	1200.94	999.59
Screen 4	7/15/98	228.10	1200.94	972.84
Screen 5	7/15/98	250.89	1200.94	950.05

TABLE 5-2

GROUNDWATER MONITORING WELL WATER-LEVEL MEASUREMENTS AUGUST 17, 1998

Well Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-1	8/17/98	23.68	1116.69	1093.01
MW-3				
Screen 1 (top)	8/17/98	94.05	1100.34	1006.29
Screen 2	8/17/98	110.19	1100.34	990.15
Screen 3	8/17/98	116.01	1100.34	984.33
Screen 4	8/17/98	199.65	1100.34	900.69
Screen 5	8/17/98	228.71	1100.34	871.63
MW-4				
Screen 1 (top)	8/17/98	72.31	1082.84	1010.53
Screen 2	8/17/98	91.26	1082.84	991.58
Screen 3	8/17/98	96.06	1082.84	986.78
Screen 4	8/17/98	106.21	1082.84	976.63
Screen 5	8/17/98	187.44	1082.84	895.40
MW-5	8/17/98	60.88	1071.62	1010.74
MW-6	8/17/98	182.49	1188.54	1006.05
MW-7	8/17/98	203.10	1212.90	1009.80
MW-8	8/17/98	128.20	1139.55	1011.35
MW-9	8/17/98	20.61	1106.06	1085.45
MW-10	8/17/98	80.11	1087.73	1007.62
MW-11				
Screen 1 (top)	8/17/98	106.49	1139.30	1032.81
Screen 2	8/17/98	135.71	1139.30	1003.59
Screen 3	8/17/98	154.19	1139.30	985.11
Screen 4	8/17/98	164.87	1139.30	974.43
Screen 5	8/17/98	225.53	1139.30	913.77
MW-12				
Screen 1 (top)	8/17/98	86.71	1102.14	1015.43
Screen 2	8/17/98	105.53	1102.14	996.61
Screen 3	8/17/98	110.50	1102.14	991.64
Screen 4	8/17/98	126.88	1102.14	975.26
Screen 5	8/17/98	191.78	1102.14	910.36
MW-13	8/17/98	174.99	1183.49	1008.50

TABLE 5-2

GROUNDWATER MONITORING WELL WATER-LEVEL MEASUREMENTS AUGUST 17, 1998

Well Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-14				
Screen 1 (top)	8/17/98	165.95	1173.47	1007.52
Screen 2	8/17/98	167.10	1173.47	1006.37
Screen 3	8/17/98	168.11	1173.47	1005.36
Screen 4	8/17/98	168.32	1173.47	1005.15
Screen 5	8/17/98	169.71	1173.47	1003.76
MW-15	8/17/98	30.16	1120.68	1090.52
MW-16	8/17/98	227.65	1236.29	1008.64
MW-17				
Screen 1 (top)	8/17/98	175.71	1191.21	1015.50
Screen 2	8/17/98	205.46	1191.21	985.75
Screen 3	8/17/98	220.47	1191.21	970.74
Screen 4	8/17/98	280.21	1191.21	911.00
Screen 5	8/17/98	290.69	1191.21	900.52
MW-18				
Screen 1 (top)	8/17/98	232.21	1225.41	993.20
Screen 2	8/17/98	234.39	1225.41	991.02
Screen 3	8/17/98	241.04	1225.41	984.37
Screen 4	8/17/98	276.57	1225.41	948.84
Screen 5	8/17/98	296.73	1225.41	928.68
MW-19				
Screen 1 (top)	8/17/98	150.94	1142.94	992.00
Screen 2	8/17/98	172.15	1142.94	970.79
Screen 3	8/17/98	179.85	1142.94	963.09
Screen 4	8/17/98	283.82	1142.94	859.12
Screen 5	8/17/98	287.32	1142.94	855.62
MW-20				
Screen 1 (top)	8/17/98	197.69	1165.05	967.36
Screen 2	8/17/98	196.93	1165.05	968.12
Screen 3	8/17/98	219.06	1165.05	945.99
Screen 4	8/17/98	235.49	1165.05	929.56
Screen 5	8/17/98	195.10	1165.05	969.95

TABLE 5-2

GROUNDWATER MONITORING WELL WATER-LEVEL MEASUREMENTS
AUGUST 17, 1998

Well Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-21				
Screen 1 (top)	8/17/98	52.95	1059.10	1006.15
Screen 2	8/17/98	53.50	1059.10	1005.60
Screen 3	8/17/98	54.79	1059.10	1004.31
Screen 4	8/17/98	56.38	1059.10	1002.72
Screen 5	8/17/98	56.69	1059.10	1002.41
MW-22				
Screen 1 (top)	8/17/98	170.36	1176.98	1006.62
Screen 2	8/17/98	176.51	1176.98	1000.47
Screen 3	8/17/98	176.57	1176.98	1000.41
Screen 4	8/17/98	195.43	1176.98	981.55
Screen 5	8/17/98	206.67	1176.98	970.31
MW-23				
Screen 1 (top)	8/17/98	101.99	1108.84	1006.85
Screen 2	8/17/98	111.30	1108.84	997.54
Screen 3	8/17/98	112.71	1108.84	996.13
Screen 4	8/17/98	136.58	1108.84	972.26
Screen 5	8/17/98	136.91	1108.84	971.93
MW-24				
Screen 1 (top)	8/17/98	191.75	1200.94	1009.19
Screen 2	8/17/98	203.46	1200.94	997.48
Screen 3	8/17/98	208.25	1200.94	992.69
Screen 4	8/17/98	234.99	1200.94	965.95
Screen 5	8/17/98	258.61	1200.94	942.33

FIGURES

JPLF1-1.DWG

Jet Propulsion Laboratory

MW-1
MW-7
MW-16
MW-11
MW-15
MW-24
MW-9
MW-6
MW-22
MW-8
MW-12
MW-13
MW-14
MW-3
MW-23
MH-01
MW-4
MW-2
MW-10
MW-5
MW-18
MW-17
MW-21
MW-19
MW-20

#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

Las Flores Water Co. Well #2

Rubio Cañon Land and Water Co. #4 #7

Oak Grove Ranger Station

Oak Grove Park

Devil's Gate Reservoir

Spreading Grounds

GOULD AVE
HAMPTON RD
CROWN
VIRO RD
OAK GROVE DR
FOOTHILL FWY
ALTADENA DR
LINCOLN AVE
CASITAS AVE
HARRIET ST
MARIPOSA DR
VENTURA ST
OLIVE AVE
GLENROSE AVE
WINDSOR AVE
FIGUEROA
CROSBY STREET

Explanation

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

N

800 400 0 800

SCALE IN FEET

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

9-25-98

FIGURE 1-1

LOCATIONS OF JPL GROUNDWATER MONITORING WELLS AND NEARBY MUNICIPAL PRODUCTION WELLS

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

jplf3-1.dwg

Jet Propulsion Laboratory

MW-1 ---
MW-7 43
MW-16 58
MW-11 1: 1.5
MW-15 ---
MW-24 1: ---
MW-9 ---
MW-6 ---
MW-8 ---
MW-12 1: ---
MW-14 1: ---
MW-22 1: ---
MW-13 15
MW-3 1: ---
MW-18 1: --- 2: ---
MW-2
MH-01
MW-23 1: 0.5
MW-4 1: ---
MW-10 ---
MW-5 ---
MW-17 1: ---
MW-21 1: ---
MW-19 1: ---
MW-20 1: ---

La Canada Irrigation District Wells — #6
Valley Water Company Wells — #1, #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
Las Flores Water Co. Well #2
Rubio Cañon Land and Water Co. Wells — #4, #7

GOULD AVE
HAMPTON RD
CROWN
VIRO RD
OAK GROVE DR
ALTADENA DR
LINCOLN AVE
CASITAS AVE
HARRIET ST
MARIPOSA DR
VENTURA ST
OLIVE AVE
GLENROSE AVE
WINDSOR AVE
FIGUEROA
CROSBY STREET
FOOTHILL FWY

Oak Grove Ranger Station
Oak Grove Park
Devil's Gate Reservoir
Spreading Grounds

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- 1: Screen Number for Wells in this Aquifer Layer
- -- Not Detected
- Detection Limit 0.5 µg/L
- JPL Thrust Fault
- JPL Property Line
- 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.

800 400 0 800
SCALE IN FEET

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

FIGURE 3-1

CONTOURS OF CARBON TETRACHLORIDE CONCENTRATIONS IN AQUIFER LAYER 1

July-August 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

9-24-98

jpl f3-2.dwg

Jet Propulsion Laboratory

MW-1
MW-2
MW-3
2: --
3: 2.4
MW-4
2: 1.5
3: --
4: --
MW-5
MW-6
MW-7
MW-8
MW-9
MW-10
MW-11
2: 0.9
3: 1.5
4: --
MW-12
2: 1.4
3: 35
4: 5.1
MW-13
MW-14
2: --
3: --
MW-15
MW-16
MW-17
2: --
3: --
MW-18
3: --
MW-19
2: --
3: --
MW-20
2: --
MW-21
2: --
3: --
MW-22
2: --
3: --
MW-23
2: --
3: --
MW-24
2: 58
3: --
MH-01

20
5
MCL

La Canada Irrigation District Wells
#6

Valley Water Company Wells
#1
#3
#2
#4
#1

City of Pasadena Arroyo Well

City of Pasadena Well 52
1.3 5/98
1.46 6/98
1.3 7/98

City of Pasadena Ventura Well
-- 5/98
-- 6/98
-- 7/98

City of Pasadena Windsor Well
-- 5/98
-- 6/98
-- 7/98

Lincoln Ave. Water Co. Well #3

Lincoln Ave. Water Co. Well #5

Las Flores Water Co. Well #2

Rubio Cañon Land and Water Co. Wells
#4
#7

Oak Grove Ranger Station

Oak Grove Park

Devil's Gate Reservoir

Spreading Grounds

GOULD AVE
HAMPTON RD
CROWN
VIRO RD
OAK GROVE DR
FOOTHILL FWY
ALTADENA DR
LINCOLN AVE
CASITAS AVE
HARRIET ST
MARIPOSA DR
VENTURA ST
OLIVE AVE
GLENROSE AVE
WINDSOR AVE
FIGUEROA
CROSBY STREET

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- 1: Screen Number for Wells in this Aquifer Layer
- -- Not Detected
- Detection Limit 0.5 µg/L
- JPL Thrust Fault
- JPL Property Line
- 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

800 400 0 800
SCALE IN FEET

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

FIGURE 3-2

CONTOURS OF CARBON TETRACHLORIDE CONCENTRATIONS IN AQUIFER LAYER 2
July-August 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

9-24-98

jpl13-3.dwg

Jet Propulsion Laboratory

MW-1
MW-2
MW-3
4: --
5: --
MW-4
5: --
MW-5
MW-6
MW-7
MW-8
MW-9
MW-10
MW-11
5: --
MW-12
5: 2.1
MW-13
MW-14
4: --
5: --
MW-15
MW-16
MW-17
4: --
5: --
MW-18
4: 2.5
5: --
MW-19
4: --
5: --
MW-20
3: --
4: --
MW-21
4: --
5: --
MW-22
4: --
5: --
MW-23
4: --
5: --
MW-24
4: --
5: --
MH-01

La Canada Irrigation District Wells
#6

Valley Water Company Wells
#1
#3
#2
#4
#1

City of Pasadena Arroyo Well

City of Pasadena Well 52
1.3 5/98
1.46 6/98
1.3 7/98

City of Pasadena Ventura Well
-- 5/98
-- 6/98
-- 7/98

City of Pasadena Windsor Well
-- 5/98
-- 6/98
-- 7/98

Lincoln Ave. Water Co. Well #3

Lincoln Ave. Water Co. Well #5

Rubio Cañon Land and Water Co. Wells
#4
#7

Las Flores Water Co. Well #2

Oak Grove Ranger Station

Oak Grove Park

Devil's Gate Reservoir

Spreading Grounds

MCL

GOULD AVE
HAMPTON RD
CROWN
VIRO RD
OAK GROVE DR
FOOTHILL FWY
ALTADENA DR
LINCOLN AVE
CASITAS AVE
HARRIET ST
MARIPOSA DR
VENTURA ST
OLIVE AVE
GLENROSE AVE
WINDSOR AVE
FIGUEROA
CROSBY STREET

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- 1: Screen Number for Wells in this Aquifer Layer
- -- Not Detected
- Detection Limit 0.5 µg/L
- JPL Thrust Fault
- JPL Property Line
- 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

800 400 0 800
SCALE IN FEET

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

FIGURE 3-3

CONTOURS OF CARBON TETRACHLORIDE CONCENTRATIONS IN AQUIFER LAYER 3

July-August 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

9-24-98

jplf3-4.dwg

Jet Propulsion Laboratory

MW-1 --
MW-7 19
MW-16 19
MW-11 1: --
MW-15 --
MW-9 --
MW-24 1: 1.7
MW-6 0.6
MW-8 --
MW-12 1: --
MW-13 15
MW-22 1: 0.9
MW-14 1: --
MW-2
MW-3 1: --
MH-01
MW-18 1: -- 2: --
MW-23 1: 9.2
MW-4 1: --
MW-10 --
MW-5 --
MW-17 1: --
MW-21 1: 16
MW-19 1: --
MW-20 1: --

20 MCL 0.5

La Canada Irrigation District Wells
#6
Valley Water Company Wells
#1 #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
Las Flores Water Co. Well #2
Rubio Cañon Land and Water Co. Wells
#4
#7

Oak Grove Ranger Station
Oak Grove Park
Devil's Gate Reservoir
Spreading Grounds

GOULD AVE
HAMPTON RD
CROWN
VIRO RD
OAK GROVE DR
FOOTHILL FWY
ALTADENA DR
LINCOLN AVE
CASITAS AVE
HARRIET ST
VENTURA ST
MARIPOSA DR
OLIVE AVE
GLENROSE AVE
WINDSOR AVE
FIGUEROA
CROSBY STREET

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- 1: Screen Number for Wells in this Aquifer Layer
- -- Not Detected
- Detection Limit 0.5 µg/L
- JPL Thrust Fault
- JPL Property Line
- 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

800 400 0 800
SCALE IN FEET

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

FIGURE 3-4

CONTOURS OF TRICHLOROETHENE CONCENTRATIONS IN AQUIFER LAYER 1

July-August 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

9-24-98

jplf3-5.dwg

Jet Propulsion Laboratory

MW-1
MW-2
MW-3
2: --
3: 0.6
MW-4
2: 3.0
3: --
4: --
MW-5
MW-6
MW-7
MW-8
MW-9
MW-10
MW-11
2: --
3: --
4: --
MW-12
2: --
3: --
4: --
MW-13
MW-14
2: 0.9
3: --
MW-15
MW-16
MW-17
2: --
3: 1.0
MW-18
3: 1.5
MW-19
2: 0.6
3: --
MW-20
2: --
MW-21
2: --
3: --
MW-22
2: --
3: --
MW-23
2: 1.1
3: --
MW-24
2: 4.0
3: --
MH-01

La Canada Irrigation District Wells
#6
#1
#3
#2
#4
#1

Valley Water Company Wells

City of Pasadena Arroyo Well

City of Pasadena Well 52
3.6 5/98
-- 6/98
3.1 7/98

City of Pasadena Ventura Well
1.1 5/98
1.3 6/98
1.0 7/98

City of Pasadena Windsor Well
-- 5/98
0.54 6/98
0.60 7/98

Lincoln Ave. Water Co. Well #3

Lincoln Ave. Water Co. Well #5

Las Flores Water Co. Well #2

Rubio Cañon Land and Water Co. Wells
#4
#7

Oak Grove Ranger Station

Oak Grove Park

Devil's Gate Reservoir

Spreading Grounds

0.5

GOULD AVE
HAMPTON RD
CROWN
VIRO RD
OAK GROVE DR
FOOTHILL FWY
ALTADENA DR
LINCOLN AVE
CASITAS AVE
HARRIET ST
MARIPOSA DR
VENTURA ST
OLIVE AVE
GLENROSE AVE
WINDSOR AVE
FIGUEROA
CROSBY STREET

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- 1: Screen Number for Wells in this Aquifer Layer
- -- Not Detected
- Detection Limit 0.5 µg/L
- JPL Thrust Fault
- JPL Property Line
- 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

800 400 0 800
SCALE IN FEET

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

FIGURE 3-5

CONTOURS OF CARBON TRICHLOROETHENE CONCENTRATIONS IN AQUIFER LAYER 2

July-August 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

9-24-98

jplf3-6.dwg

Jet Propulsion Laboratory

MW-1
MW-2
MW-3
4: ---
5: ---
MW-4
5: ---
MW-5
MW-6
MW-7
MW-8
MW-9
MW-10
MW-11
5: ---
MW-12
5: ---
MW-13
MW-14
4: ---
5: ---
MW-15
MW-16
MW-17
4: 8.9
5: 8.9
MW-18
4: 0.6
5: ---
MW-19
4: ---
5: ---
MW-20
3: ---
4: ---
MW-21
4: 0.8
5: ---
MW-22
4: ---
5: ---
MW-23
4: ---
5: ---
MW-24
4: ---
5: ---
MH-01

La Canada Irrigation District Wells
#6

Valley Water Company Wells
#1
#3
#2
#4
#1

City of Pasadena Arroyo Well

City of Pasadena Well 52
3.6 5/98
--- 6/98
3.1 7/98

City of Pasadena Ventura Well
1.1 5/98
1.3 6/98
1.0 7/98

City of Pasadena Windsor Well
--- 5/98
0.54 6/98
0.60 7/98

Lincoln Ave. Water Co. Well #3

Lincoln Ave. Water Co. Well #5

Rubio Cañon Land and Water Co. Wells
#4
#7

Las Flores Water Co. Well #2

Oak Grove Ranger Station

Oak Grove Park

Devil's Gate Reservoir

Spreading Grounds

MCL

0.5

GOULD AVE
HAMPTON RD
CROWN
VIRO RD
OAK GROVE DR
FOOTHILL FWY
ALTADENA DR
LINCOLN AVE
CASITAS AVE
HARRIET ST
MARIPOSA DR
VENTURA ST
OLIVE AVE
GLENROSE AVE
WINDSOR AVE
FIGUEROA
CROSBY STREET

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- 1: Screen Number for Wells in this Aquifier Layer
- --- Not Detected
- Detection Limit 0.5 µg/L
- JPL Thrust Fault
- JPL Property Line
- 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

800 400 0 800
SCALE IN FEET

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

FIGURE 3-6

CONTOURS OF TRICHLOROETHENE CONCENTRATIONS IN AQUIFER LAYER 3

July-August 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

9-24-98

jpif3-7.dwg

Jet Propulsion Laboratory

MW-1 --
MW-3 1: --
MW-4 1: --
MW-5 --
MW-6 --
MW-7 0.6
MW-8 --
MW-9 --
MW-10 --
MW-11 1: --
MW-12 1: --
MW-13 --
MW-14 1: --
MW-15 --
MW-16 0.8
MW-17 1: --
MW-18 1: -- 2: --
MW-19 1: --
MW-20 1: --
MW-21 1: --
MW-22 1: --
MW-23 1: --
MW-24 1: --
MH-01

MCL

La Canada Irrigation District Wells
#6
Valley Water Company Wells
#1
#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
Las Flores Water Co. Well #2
Rubio Cañon Land and Water Co. Wells
#4
#7

Oak Grove Ranger Station
Oak Grove Park
Devil's Gate Reservoir
Spreading Grounds

GOULD AVE
HAMPTON RD
CROWN
VIRO RD
OAK GROVE DR
FOOTHILL FWY
ALTADENA DR
LINCOLN AVE
CASITAS AVE
HARRIET ST
MARIPOSA DR
VENTURA ST
OLIVE AVE
GLENROSE AVE
WINDSOR AVE
FIGUEROA
CROSBY STREET

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- 1: Screen Number for Wells in this Aquifer Layer
- -- Not Detected
- Detection Limit 0.5 µg/L
- JPL Thrust Fault
- JPL Property Line
- 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

800 400 0 800

SCALE IN FEET

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

FIGURE 3-7

CONTOURS OF 1,2 DICHLOROETHANE CONCENTRATIONS IN AQUIFER LAYER 1

July-August 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

9-24-98

jplf3-8.dwg

Jet Propulsion Laboratory

MW-1 —
MW-7 0.8
MW-16 1.3
MW-11 1: --
MW-15 --
MW-24 1: --
MW-9 --
MW-6 2.5
MW-8 --
MW-12 1: --
MW-22 1: 1.7
MW-13 0.6
MW-14 1: 0.8
MW-3 1: --
MH-01
MW-18 1: -- 2: --
MW-2
MW-23 1: --
MW-4 1: --
MW-10 --
MW-5 --
MW-21 1: 0.6
MW-17 1: --
MW-19 1: --
MW-20 1: --

La Canada Irrigation District Wells
#6
Valley Water Company Wells
#1
#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
Las Flores Water Co. Well #2
Rubio Cañon Land and Water Co. Wells
#4
#7

Oak Grove Ranger Station
Oak Grove Park
Devil's Gate Reservoir
Spreading Grounds

GOULD AVE
HAMPTON RD
CROWN
VIRO RD
OAK GROVE DR
FOOTHILL FWY
ALTADENA DR
LINCOLN AVE
CASITAS AVE
HARRIET ST
MARIPOSA DR
VENTURA ST
OLIVE AVE
GLENROSE AVE
WINDSOR AVE
FIGUEROA
CROSBY STREET
MCL

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- 1: Screen Number for Wells in this Aquifer Layer
- -- Not Detected
- Detection Limit 0.5 µg/L
- JPL Thrust Fault
- JPL Property Line
- 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

800 400 0 800

SCALE IN FEET

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

FIGURE 3-8

CONTOURS OF TETRACHLOROETHENE CONCENTRATIONS IN AQUIFER LAYER 1

July-August 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

9-24-98

jplf3-9.dwg

Jet Propulsion Laboratory

MW-1
MW-2
MW-3
2: --
3: --
MW-4
2: 0.8
3: --
4: --
MW-5
MW-6
MW-7
MW-8
MW-9
MW-10
MW-11
2: --
3: --
4: --
MW-12
2: --
3: --
4: --
MW-13
MW-14
2: 1.8
3: --
MW-15
MW-16
MW-17
2: --
3: --
MW-18
3: 0.9
MW-19
2: 0.7
3: 2.1
MW-20
2: --
MW-21
2: 0.7
3: 0.9
MW-22
2: --
3: --
MW-23
2: 1.0
3: --
MW-24
2: 1.5
3: --
MH-01

La Canada Irrigation District Wells
#6

Valley Water Company Wells
#1
#3
#2
#4
#1

City of Pasadena Arroyo Well

City of Pasadena Well 52
-- 5/98
3.76 6/98
-- 7/98

City of Pasadena Ventura Well
0.60 5/98
0.72 6/98
-- 7/98

City of Pasadena Windsor Well
1.0 5/98
1.29 6/98
0.8 7/98

Lincoln Ave. Water Co. Well #3

Lincoln Ave. Water Co. Well #5

Las Flores Water Co. Well #2

Rubio Cañon Land and Water Co. Wells
#4
#7

Oak Grove Ranger Station

Oak Grove Park

Devil's Gate Reservoir

Spreading Grounds

0.5

GOULD AVE
HAMPTON RD
CROWN
VIRO RD
OAK GROVE DR
FOOTHILL FWY
ALTADENA DR
LINCOLN AVE
CASITAS AVE
HARRIET ST
MARIPOSA DR
VENTURA ST
OLIVE AVE
GLENROSE AVE
FIGUEROA
WINDSOR AVE
CROSBY STREET

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Part Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- 1: Screen Number for Wells in this Aquifer Layer
- -- Not Detected
- Detection Limit 0.5 µg/L
- JPL Thrust Fault
- JPL Property Line
- 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

800 400 0 800
SCALE IN FEET

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

FIGURE 3-9

CONTOURS OF CARBON TETRACHLOROETHENE CONCENTRATIONS IN AQUIFER LAYER 2

July-August 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

9-24-98

jplf3-10.dwg

Jet Propulsion Laboratory

MW-1
MW-2
MW-3 4: --- 5: ---
MW-4 5: ---
MW-5
MW-6
MW-7
MW-8
MW-9
MW-10
MW-11 5: ---
MW-12 5: ---
MW-13
MW-14 4: --- 5: ---
MW-15
MW-16
MW-17 4: 0.6 5: 0.6
MW-18 4: 1.2 5: ---
MW-19 4: --- 5: 1.5
MW-20 3: --- 4: ---
MW-21 4: 4.3 5: 7.6
MW-22 4: --- 5: ---
MW-23 4: --- 5: ---
MW-24 4: --- 5: ---
MH-01

La Canada Irrigation District Wells
#6

Valley Water Company Wells
#1
#3
#2
#4
#1

City of Pasadena Arroyo Well

City of Pasadena Well 52
--- 5/98
3.76 6/98
--- 7/98

City of Pasadena Ventura Well
0.60 5/98
0.72 6/98
--- 7/98

City of Pasadena Windsor Well
1.0 5/98
1.29 6/98
0.80 7/98

Lincoln Ave. Water Co. Well #3

Lincoln Ave. Water Co. Well #5

Rubio Cañon Land and Water Co. Wells
#4
#7

Las Flores Water Co. Well #2

Oak Grove Ranger Station

Oak Grove Park

Devil's Gate Reservoir

Spreading Grounds

0.5

MCL

GOULD AVE
HAMPTON RD
CROWN
VIRO RD
OAK GROVE DR
FOOTHILL FWY
ALTADENA DR
LINCOLN AVE
CASITAS AVE
VENTURA ST
HARRIET ST
MARIPOSA DR
OLIVE AVE
GLENROSE AVE
WINDSOR AVE
FIGUEROA
CROSBY STREET

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- 1: Screen Number for Wells in this Aquifer Layer
- --- Not Detected
- Detection Limit 0.5 µg/L
- JPL Thrust Fault
- JPL Property Line
- 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

800 400 0 800
SCALE IN FEET

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

FIGURE 3-10

CONTOURS OF TETRACHLOROETHENE CONCENTRATIONS IN AQUIFER LAYER 3

July-August 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

9-24-98

jplf3-11.dwg

Jet Propulsion Laboratory

MW-1 --
MW-2
MW-3 1: --
MW-4 1: --
MW-5 --
MW-6 4.2
MW-7 190
MW-8 --
MW-9 --
MW-10 --
MW-11 1: --
MW-12 1: --
MW-13 59
MW-14 1: 4.4
MW-15 --
MW-16 420
MW-17 1: --
MW-18 1: -- 2: --
MW-19 1: --
MW-20 1: 5.9
MW-21 1: 13
MW-22 1: 6.4
MW-23 1: 19
MW-24 1: 20
MH-01

La Canada Irrigation District Wells
#6

Valley Water Company Wells
#1
#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

Las Flores Water Co. Well #2

Rubio Cañon Land and Water Co. Wells
#4
#7

Oak Grove Ranger Station
Oak Grove Park
Devil's Gate Reservoir
Spreading Grounds

GOULD AVE
HAMPTON RD
CROWN
VIRO RD
OAK GROVE DR
FOOTHILL FWY
ALTADENA DR
LINCOLN AVE
CASITAS AVE
HARRIET ST
MARIPOSA DR
VENTURA ST
OLIVE AVE
GLENROSE AVE
WINDSOR AVE
FIGUEROA
CROSBY STREET

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- 1: Screen Number for Wells in this Aquifer Layer
- -- Not Detected
- Detection Limit 4 µg/L
- JPL Thrust Fault
- JPL Property Line
- 4 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

800 400 0 800
SCALE IN FEET

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

FIGURE 3-11

CONTOURS OF PERCHLORATE CONCENTRATIONS IN AQUIFER LAYER 1

July-August 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

9-25-98

jplf3-12.dwg

Jet Propulsion Laboratory

MW-1
MW-2
MW-3
2: --
3: 10
MW-4
2: 29
3: --
4: --
MW-5
MW-6
MW-7
MW-8
MW-9
MW-10
MW-11
2: --
3: --
4: --
MW-12
2: 5.1
3: 6.6
4: 6.0
MW-13
MW-14
2: 4.9
3: 5.9
MW-15
MW-16
MW-17
2: --
3: --
MW-18
3: --
MW-19
2: --
3: 4.4
MW-20
2: --
MW-21
2: --
3: --
MW-22
2: 4.9
3: --
MW-23
2: 7.8
3: --
MW-24
2: 500
3: --
MH-01

La Canada Irrigation District Wells
#6
Valley Water Company Wells
#1
#3
#2
#4
#1
City of Pasadena Arroyo Well
City of Pasadena Well 52
23 4/98
16 6/98
17 6/98
22 7/98
City of Pasadena Ventura Well
6.0 4/98
4.0 6/98
-- 6/98
5.0 7/98
City of Pasadena Windsor Well
-- 4/98
-- 6/98
-- 6/98
-- 7/98
Lincoln Ave. Water Co. Well #3
Lincoln Ave. Water Co. Well #5
Las Flores Water Co. Well #2
Rubio Cañon Land and Water Co. Wells
#4
#7
Oak Grove Ranger Station
Oak Grove Park
Devil's Gate Reservoir
Spreading Grounds

GOULD AVE
HAMPTON RD
CROWN
VIRO RD
OAK GROVE DR
FOOTHILL FWY
ALTADENA DR
LINCOLN AVE
CASITAS AVE
HARRIET ST
MARIPOSA DR
VENTURA ST
OLIVE AVE
GLENROSE AVE
WINDSOR AVE
FIGUEROA
CROSBY STREET

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- 1: Screen Number for Wells in this Aquifer Layer
- -- Not Detected
- Detection Limit 4 µg/L
- JPL Thrust Fault
- JPL Property Line
- 4 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

800 400 0 800

SCALE IN FEET

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

FIGURE 3-12

CONTOURS OF PERCHLORATE CONCENTRATIONS IN AQUIFER LAYER 2

July-August 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

9-22-98

jplf3-13.dwg

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- 1: Screen Number for Wells in this Aquifer Layer
- -- Not Detected
- Detection Limit 4 µg/L
- JPL Thrust Fault
- JPL Property Line
- 4 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.

800 400 0 800

SCALE IN FEET

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

Jet Propulsion Laboratory

MW-1
MW-2 (4: --, 5: --)
MW-3 (4: --, 5: --)
MW-4 (5: --)
MW-5
MW-6
MW-7
MW-8
MW-9
MW-10
MW-11 (5: --)
MW-12 (5: --)
MW-13
MW-14 (4: --, 5: --)
MW-15
MW-16
MW-17 (4: 14, 5: 13)
MW-18 (4: 16, 5: --)
MW-19 (4: --, 5: --)
MW-20 (3: --, 4: --)
MW-21 (4: 4.3, 5: --)
MW-22 (4: --, 5: --)
MW-23 (4: --, 5: --)
MW-24 (4: --, 5: --)
MH-01

La Canada Irrigation District Wells — #6
Valley Water Company Wells — #1, #3, #2, #4, #1
City of Pasadena Arroyo Well
City of Pasadena Well 52 — 23 4/98; 16 5/98; 17 6/98; 22 7/98
City of Pasadena Ventura Well — 6.0 4/98; 4.0 5/98; -- 6/98; 5.0 7/98
City of Pasadena Windsor Well — -- 4/98; -- 5/98; -- 6/98; -- 7/98
Lincoln Ave. Water Co. Well #3
Lincoln Ave. Water Co. Well #5
Rubio Cañon Land and Water Co. Wells — #4, #7
Las Flores Water Co. Well #2

Oak Grove Ranger Station
Oak Grove Park
Devil's Gate Reservoir
Spreading Grounds

GOULD AVE
HAMPTON RD
CROWN AVE
VIRO RD
OAK GROVE DR
FOOTHILL FWY
ALTADENA DR
LINCOLN AVE
CASITAS AVE
HARRIET ST
MARIPOSA DR
VENTURA ST
OLIVE AVE
GLENROSE AVE
WINDSOR AVE
FIGUEROA
CROSBY STREET

FIGURE 3-13

CONTOURS OF PERCHLORATE CONCENTRATIONS IN AQUIFER LAYER 3

July-August 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

9-24-98

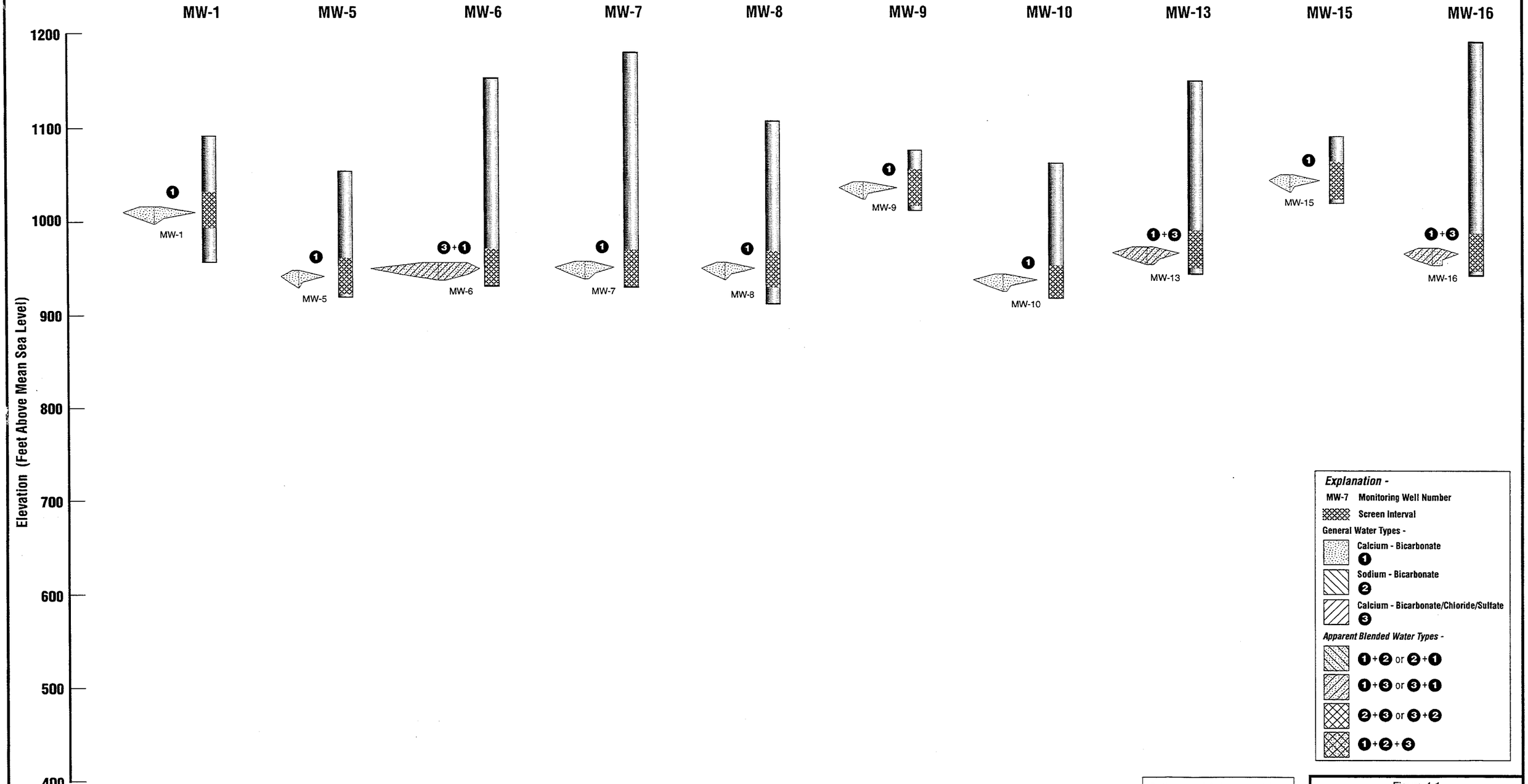

Figure 4-1

Stiff Diagrams for On-Site JPL Shallow Monitoring Wells July- August, 1998

Jet Propulsion Laboratory
Pasadena, California

1572.0244

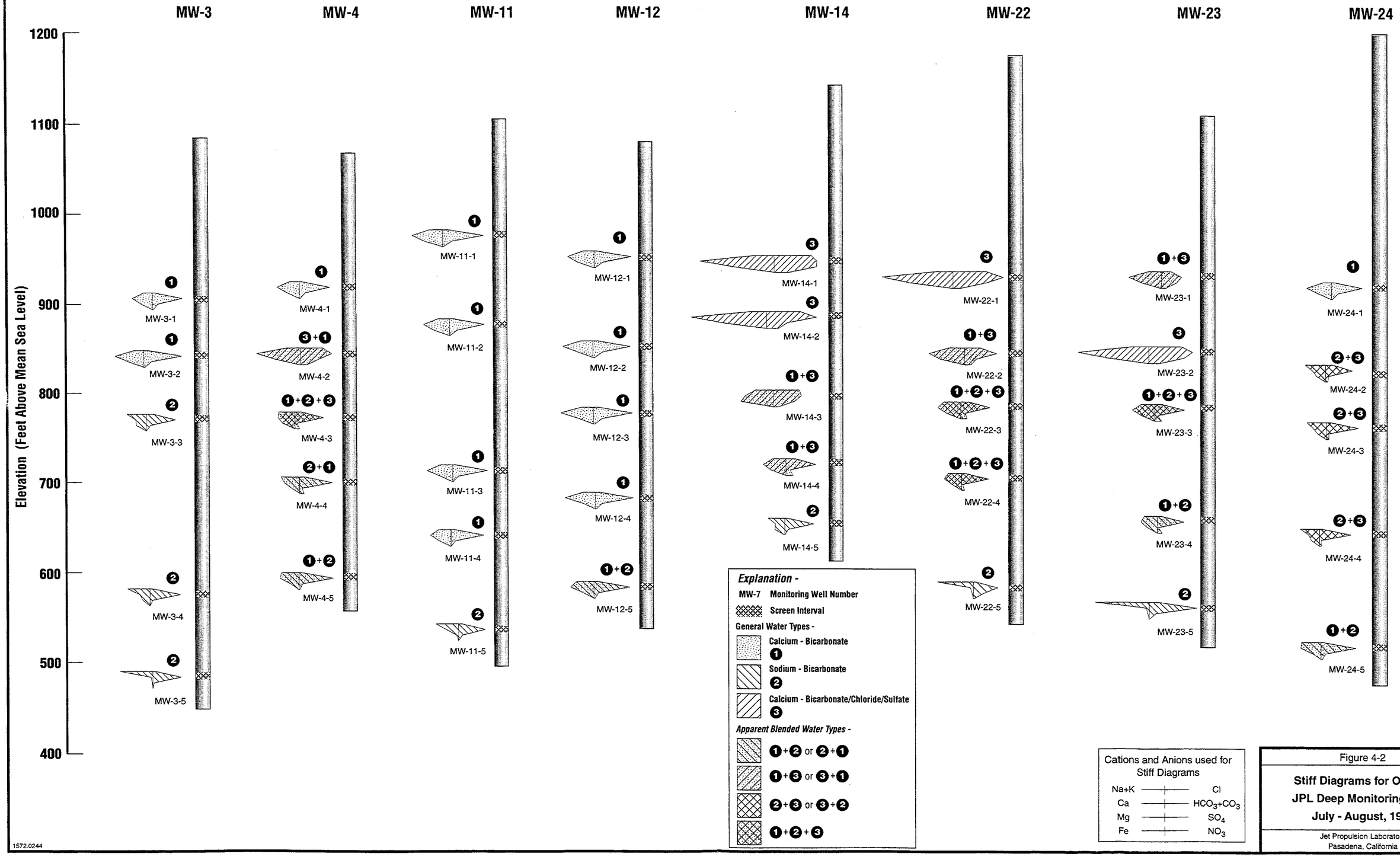

Figure 4-2

Stiff Diagrams for On-Site JPL Deep Monitoring Wells July - August, 1998

Jet Propulsion Laboratory
Pasadena, California

1572.0244

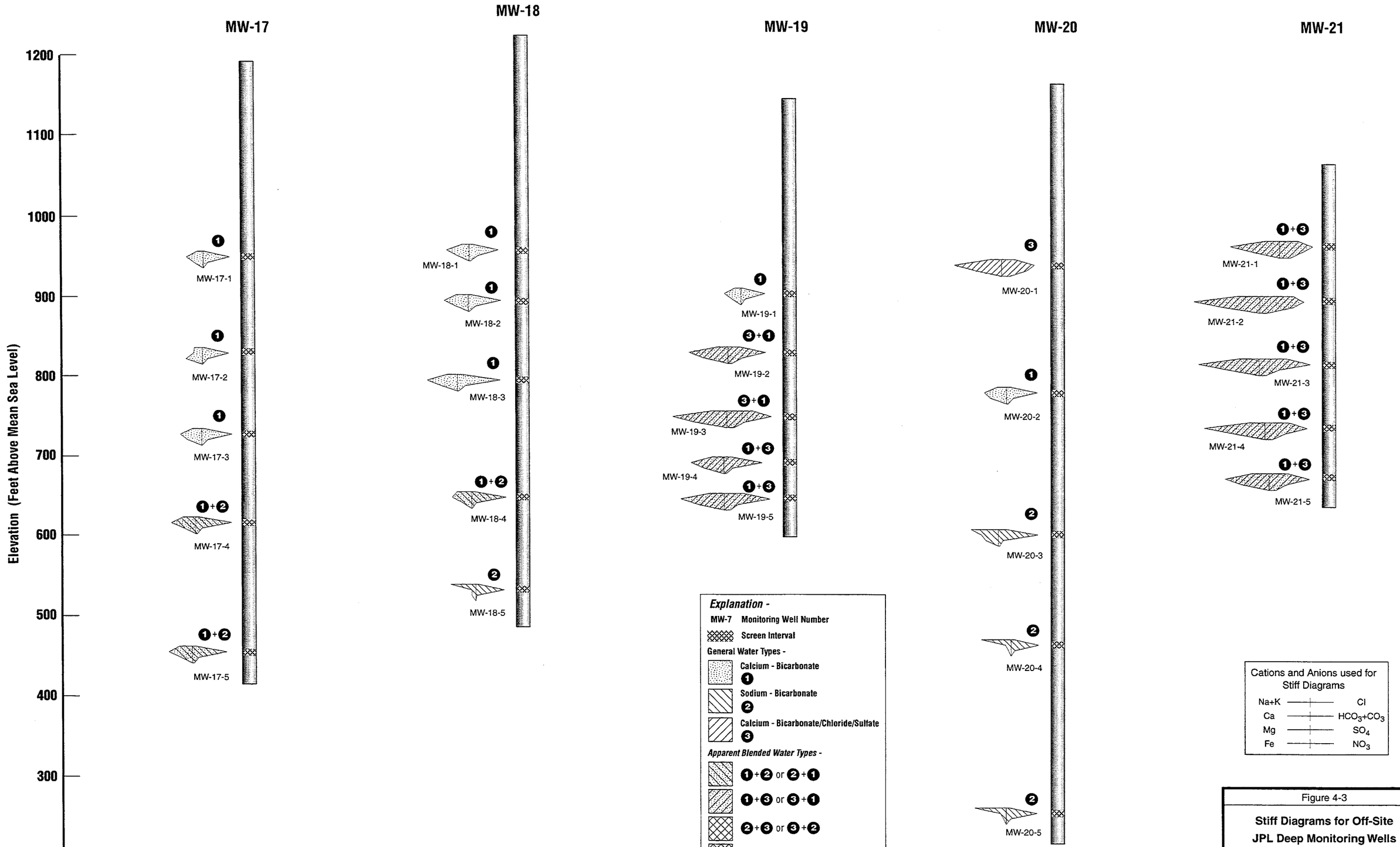

Figure 4-3

Stiff Diagrams for Off-Site JPL Deep Monitoring Wells July - August, 1998

Jet Propulsion Laboratory
Pasadena, California

1572.0244

51980715.DWG

Jet Propulsion Laboratory

MW-1 1094.00
MW-3 1010.59
MW-4 1020.68
MW-5 1021.54
MW-6 1010.98
MW-7 1017.19
MW-8 1019.17
MW-9 1086.55
MW-10 1016.41
MW-11 1037.18
MW-12 1023.31
MW-13 1015.56
MW-14 1011.11
MW-15 1091.43
MW-16 1015.50
MW-17 1015.37
MW-18 996.75
MW-19 1001.22
MW-20 971.31
MW-21 1011.69
MW-22 1012.85
MW-23 1014.27
MW-24 1016.70
MH-01

1090 1080 1070 1060 1050 1040 1030
1020 1015 1010 1005 1000 995 990
1010 1005 1000 995 990 985 980 975 970

#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 Cañon Land and Water Co. #4 #7
Las Flores Water Co. Well #2

Oak Grove Ranger Station
Oak Grove Park
Devil's Gate Reservoir
Spreading Grounds

GOULD AVE
HAMPTON RD
CROWN
VIRO RD
OAK GROVE DR
FOOTHILL FWY
ALTADENA DR
LINCOLN AVE
CASITAS AVE
HARRIET ST
VENTURA ST
MARIPOSA DR
OLIVE AVE
GLENROSE AVE
WINDSOR AVE
FIGUEROA
CROSBY STREET

Explanation

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

Note: Contours Represent Feet Above Mean Sea Level

N

800 400 0 800
SCALE IN FEET

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

FIGURE 5-1

WATER-TABLE ELEVATION CONTOUR MAP

July 15, 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

9-14-98

52980817.DWG

Jet Propulsion Laboratory

MW-1 1093.01
MW-7 1009.80
MW-16 1008.64
MW-11 1032.81
MW-15 1090.52
MW-9 1085.45
MW-6 1006.05
MW-22 1006.52
MW-24 1009.19
MW-8 1011.35
MW-12 1015.43
MW-13 1008.50
MW-14 1007.52
MW-23 1006.85
MW-3 1006.29
MW-18 993.20
MW-2
MW-4 1010.53
MH-01
MW-10 1007.62
MW-5 1010.74
MW-17 1015.50
MW-21 1006.15
MW-19 992.00
MW-20 967.36

1080 1070 1060 1050 1040 1030 1020 1015 1010 1005 1000 995 990 1005 1000 995 990 985 1000 995 990 985 980 975 970 965

#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 Cañon Land and Water Co. #4 #7

Las Flores Water Co. Well #2

Oak Grove Ranger Station

Oak Grove Park

Devil's Gate Reservoir

Spreading Grounds

GOULD AVE
HAMPTON RD
CROWN
VIRO RD
OAK GROVE DR
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ALTADENA DR
LINCOLN AVE
CASITAS AVE
VENTURA ST
HARRIET ST
MARIPOSA DR
OLIVE AVE
GLENROSE AVE
WINDSOR AVE
FIGUEROA
CROSBY STREET

Explanation

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

Note: Contours Represent Feet Above Mean Sea Level

800 400 0 800

SCALE IN FEET

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

FIGURE 5-2

WATER-TABLE ELEVATION CONTOUR MAP

August 17, 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

9-14-98

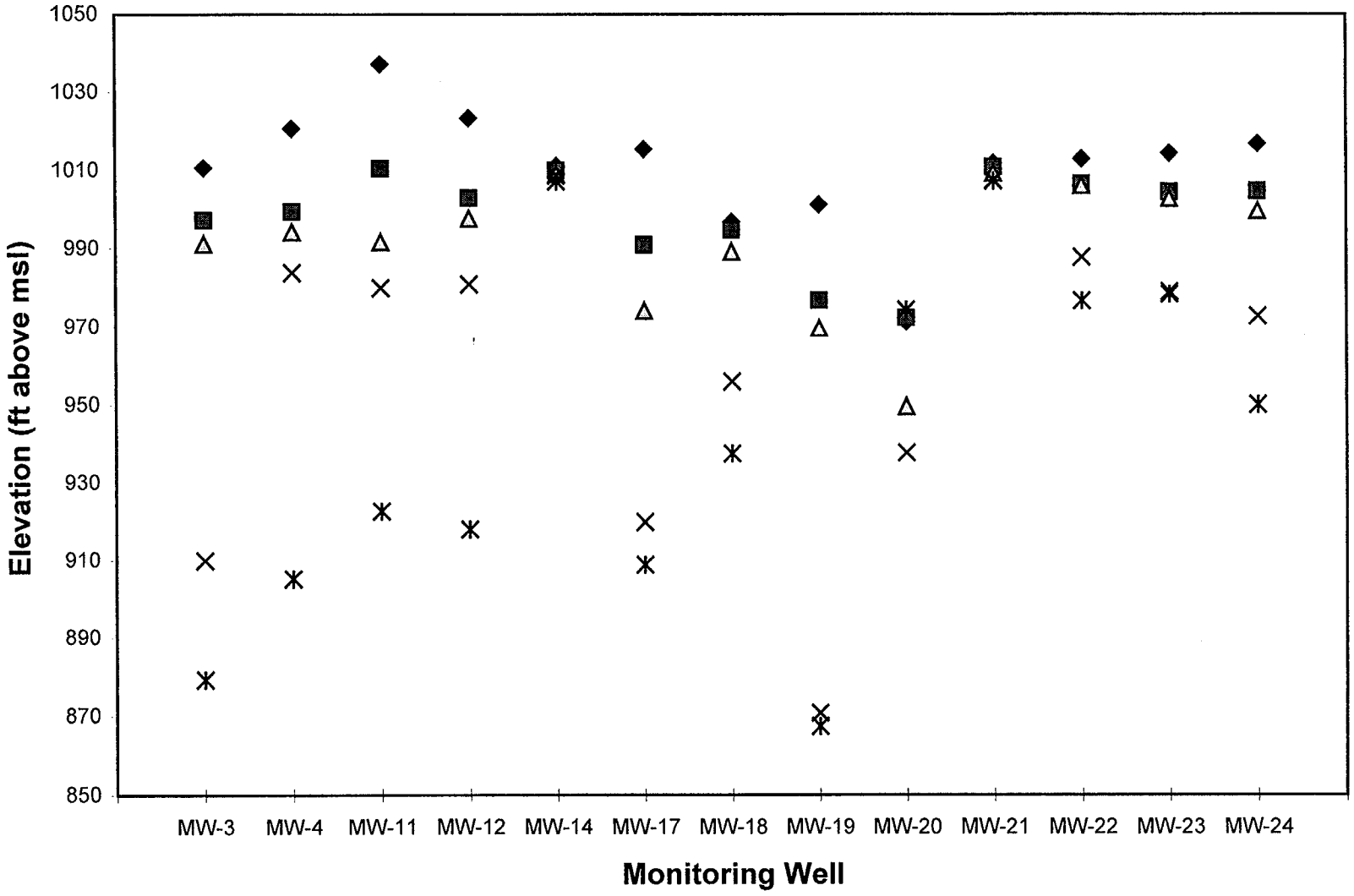

Figure 5-3

HYDRAULIC HEAD ELEVATIONS

FROM DEEP (MP) WELLS

July 15, 1998

Jet Propulsion Laboratory

Pasadena, California

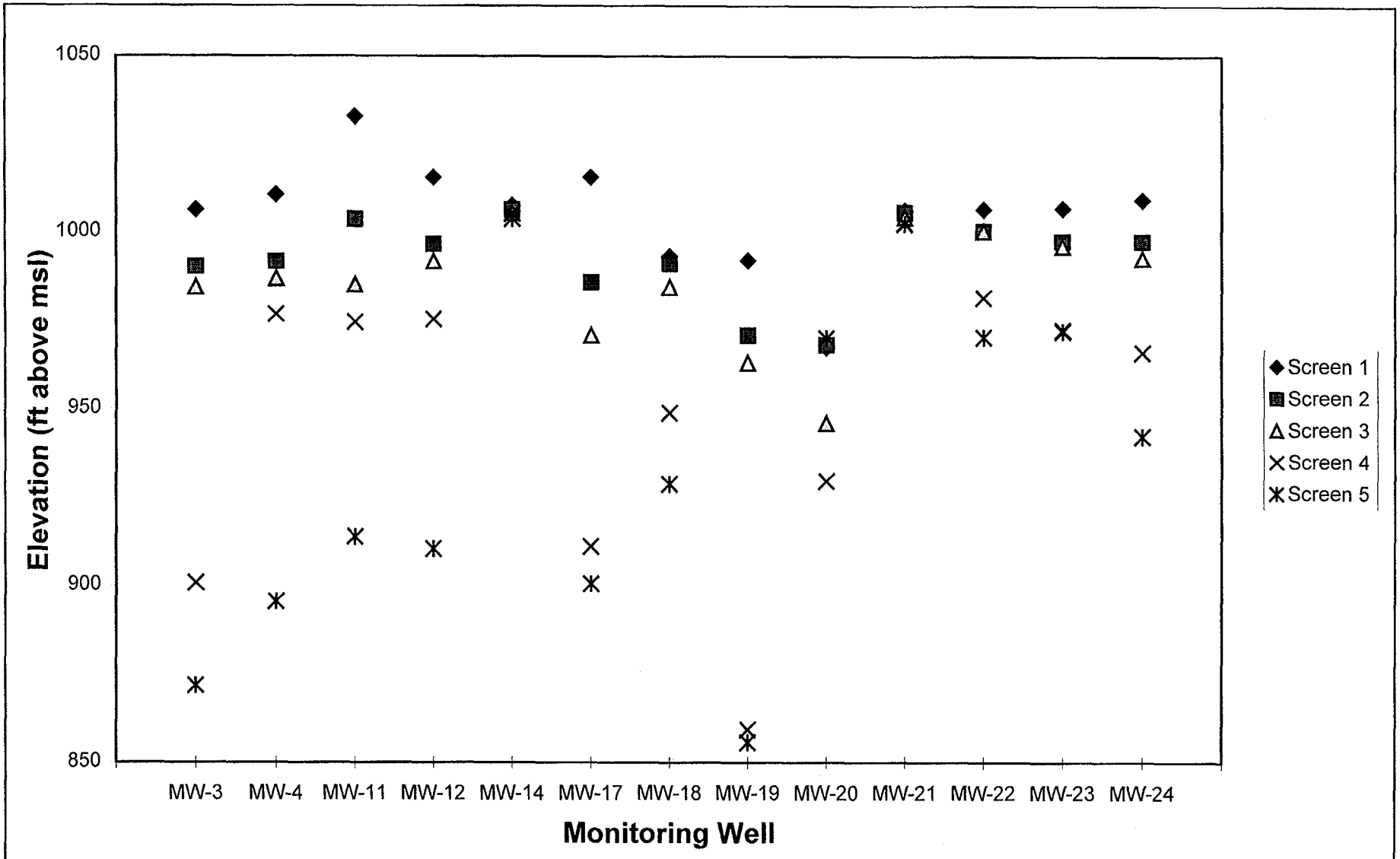

Figure 5-4

HYDRAULIC HEAD ELEVATIONS

FROM DEEP (MP) WELLS

August 17, 1998

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 : JPC
Project Number : 1572 0250
Date : 8/6/98
Site Engineer : T. Bunny

Well Number : MW-1
Equipment : DRT-15CE, YSI 3520, Solinst H2O Level Tape
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	23.09	TOC	23.09
Depth to Sediment (ft)	119.20	TOC	119.20
Thickness of Sediment (ft)	0.8		0.8

Depth of Well (ft): 120
Diameter of Casing (ft): 0.333
Water Column Height (ft): 96.11
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 62.51
Casing Volumes Purged: 1.56
Total Volume Purged (gals): 97.5

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1000						Start pump; Set Control Box @ 275 Hz
1005	7.32	10.5	19.9	498	2.5	Water sl. clear
1010	7.38	6.62	19.7	504	2.5	Water clear
1015	7.71	2.60	18.5	482	2.5	Water v. clear
1020	7.63	1.01	19.9	470	2.5	Water v. clear
1025	7.56	1.00	19.4	463	2.5	Water v. clear
1030	7.56	0.96	19.2	462	2.5	Water v. clear
1033	7.57	0.98	19.3	463	2.5	Water v. clear
1036	7.56	0.95	19.4	461	2.5	Water v. clear
1039	—	—	—	—	0.02	Reduce Flow
1040	—	—	—	—	0.02	Sample MW-983-079
1045	—	—	—	—	—	Shut Down Pump

Notes Sampling Procedures: Set pump @ 26' BTOC

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 15720250
Date : 8/5/98
Site Engineer : T. Blaney

Well Number : MW-5
Equipment : DRT-15CE YSI 3500
Solinst H2O Level Tape
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	56.67	TOC	56.67
Depth to Sediment (ft)	133.80	TOC	133.80
Thickness of Sediment (ft)	6.2		6.2
Depth of Well (ft)	140.0		
Diameter of Casing (ft)	0.333		
Water Column Height (ft)	77.13		

Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 50.34

Casing Volumes Purged: 2.43

Total Volume Purged (gals): 122.5

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1050					2.5	Start Pump Set Control Box @ 275 Hz
1055	7.17	152.4	17.9	.258	2.5	Water V. Dirty
1105	7.01	578	18.0	.246	2.5	Water Sl. Dirty
1110	7.03	333	18.0	.247	2.5	Water Sl. Clean
1115	6.99	20.5	18.1	.243	2.5	Water Sl. clean
1120	7.01	15.5	18.3	.243	2.5	Water clean
1125	7.04	9.4	18.2	.244	2.5	Water V. Clean
1130	7.02	5.0	18.1	.243	2.5	Water Ext. clean
1133	7.03	4.68	18.2	.243	2.5	Water Ext. clean
1136	7.05	4.63	18.1	.242	2.5	Water Ext. clean
1139	—	—	—	—	0.02	Reduce Flow
1140	—	—	—	—	0.02	Sample MW-983-067
1145	—	—	—	—	—	Shut Down Pump

Notes Sampling Procedures: Set pump @ 60 ft btoc.

F4

FOSTER WHELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : PL

Project Number : 1572 0250

Date : 8/5/98

Site Engineer : T BLANEY

Well Number : MW-6

Equipment : DCT-SCE 4SI 3S6 Schlust water level TAPE

Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	180.48	TOC	180.48
Depth to Sediment (ft)	238.9	TOC	238.9
Thickness of Sediment (ft)	6.1		6.1
Depth of Well (ft)	~~240~~ 245		
Diameter of Casing (ft)	0.333		
Water Column Height (ft)	58.42		

Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 38.06

Casing Volumes Purged 2.12

Total Volume Purged (gals) 80.58

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (μmhos)	Pump Rate (gpm)	Comments
0818					1.58	START Pump Set Control
						Box @ 385 Hz.
0830	7.06	52.5	22.1	957	1.58	Water cloudy
0840	7.00	70.3	21.5	938	1.58	water v cloudy
0852	6.94	18.5	21.8	936	1.58	water s/ clear
0855	6.93	8.04	21.8	938	1.58	water clear
0900	6.94	3.09	21.5	936	1.58	water EXT clear
0903	6.92	3.00	21.5	932	1.58	water EXT. clear
0906	6.91	2.94	21.6	932	1.58	water EXT. clear
0909	—	—	—	—	0.02	Reduce Flow
0910	—	—	—	—	0.02	Sample MW-987-066
0913	—	—	—	—	~~0.02~~	SHUT Down Pump

Notes Sampling Procedures: Set pump @ 184 ftbtoc.

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0250
Date : 7/31/98
Site Engineer : T. Bandy

Well Number : MW-7
Equipment : DRT-15CE
YSI 3570
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	198.70	TOC	198.70
Depth to Sediment (ft)	268.50	TOC	268.50
Thickness of Sediment (ft)	1.5		1.5

Depth of Well (ft) 270
Diameter of Casing (ft) 0.333
Water Column Height (ft) 69.8

Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 45.47
Casing Volumes Purged 2.50

Total Volume Purged (gals) 113.68

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1300					1.16	START Pump. Control Box Set @ 330 Hz
1315	7.46	>200	26.5	510	1.16	Water v. Dirty (orangish)
1320	7.38	113.4	26.2	497	1.16	Water Dirty (orangish)
1325	7.39	64.2	25.1	490	1.16	Water Dirty (orangish)
1330	7.22	55.5	25.7	487	1.16	Water sl. Dirty (orangish)
1335	7.32	36.7	25.1	488	1.16	Water sl. Dirty (orangish)
1340	7.30	32.8	25.6	490	1.16	Water sl. cloudy
1345	7.22	28.7	25.8	491	1.16	Water sl. cloudy
1350	7.24	25.3	25.7	489	1.16	Water sl. clear
1355	7.23	22.1	25.3	488	1.16	Water sl. clear
1400	7.23	19.5	25.3	488	1.16	Water sl. clear
1405	7.24	19.5	25.2	488	1.16	Water sl clear
1410	7.22	17.9	25.3	494	1.16	Water sl. clear
1415	7.25	24.4	26.8	513	1.16	Water sl clear
1420	7.33	28.5	25.3	468	1.16	Water ~~sl~~ cloudy (Pump Arm locked)
1425	7.28	15.8	23.7	474	1.16	Water clear
1430	7.27	10.4	24.0	472	1.16	Water clear
1435	7.26	5.5	24.1	474	1.16	water clear

Notes Sampling Procedures:

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JDL
Project Number : 1572 0250
Date : 7/31/98
Site Engineer : T. Blaney

Well Number : MW-7
Equipment : DRT-15CE
TSZ 350
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	198.70	TOC	198.70
Depth to Sediment (ft)	268.50	TOC	268.50
Thickness of Sediment (ft)	1.5		1.5

Depth of Well (ft) 270
Diameter of Casing (ft) 0.333
Water Column Height (ft) 69.8
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 45.47
Casing Volumes Purged 2.50
Total Volume Purged (gals) 113.68

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1430	7.27	4.9	24.0	471	1.16	With EXT clear
1441	7.26	4.7	24.0	472	1.16	With EXT clear
1444	—	—	—	—	0.02	Reduce Flow
1445	—	—	—	—	0.02	Sample MW-983-005
						" MW-983-005 MS
						" MW-983-005 MSD
1445	—	—	—	—	—	Collect MW-983-200 (Field Blank).
1450	—	—	—	—	—	Shut Down Pump

Notes Sampling Procedures:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 15720252
Date : 8/5/98
Site Engineer : T. Blaney

Well Number : MW-8
Equipment : QED-1SCE YSI 3520 Solinst H2O Level Tape
Contractor : N/A

	Before	*Reference Point*	*After*
Depth to Water (ft)	124.90	TOC	124.90
Depth to Sediment (ft)	202.20	TOC	202.20
Thickness of Sediment (ft)	2.8		2.8
Depth of Well (ft)	205		
Diameter of Casing (ft)	0.333		
Water Column Height (ft)	77.3		

Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 50.36

Casing Volumes Purged: 1.16

Total Volume Purged (gals): 58.5

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1325					1.5	Start pump. Set Control
						Box @ 275 Hz
1330	7.10	4.80	25.7	385	1.5	Water Ext. Clean
1335	7.06	4.18	23.7	346	1.5	Water Ext. Clean
1340	6.88	3.23	23.7	343	1.5	Water Ext. Clean
1345	6.98	1.93	22.2	336	1.5	Water Ext. Clean
1350	7.03	1.81	22.1	338	1.5	Water Ext. Clean
1355	7.09	1.55	21.9	338	1.5	Water Ext. Clean
1358	7.11	1.22	21.8	339	1.5	Water Ext. Clean
1401	7.10	1.20	21.9	341	1.5	Water Ext. Clean
1404	—	—	—	—	0.02	Reduce Flow
1405	—	—	—	—	0.02	Sample MW-983-064
1410	—	—	—	—	—	Shut Down pump

Notes Sampling Procedures: Set pump @ 128' BTOC

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572 0252
Date : 8/6/98
Site Engineer : T. Blaney
Well Number : MW-9
Equipment : QED-1500 YSI 3560
Solinst H2O Level meter
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	20.08	TOC	20.08
Depth to Sediment (ft)	66.90	TOC	66.90
Thickness of Sediment (ft)	3.10		3.10

Depth of Well (ft) 70
Diameter of Casing (ft) 0.333
Water Column Height (ft) 46.82
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 43.53
Casing Volumes Purged 2.83
Total Volume Purged (gals) 123.2

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0825						START Pump. Control Box set
~~0830~~						@ 250 Hz.
0830	7.08	33.2	19.2	358	2.8	WATER CLOUDY
0835	7.24	28.5	19.0	355	2.8	WATER CLOUDY
0840	7.24	20.1	19.2	354	2.8	WATER CLEARING
0845	7.23	18.0	19.1	355	2.8	WATER CLEARING
0850	7.21	12.9	19.1	354	2.8	WATER SL. CLEAR
0855	7.24	6.45	19.4	355	2.8	WATER SL CLEAR
0900	7.23	4.31	19.2	355	2.8	WATER V CLEAR
0905	7.24	3.12	19.3	355	2.8	WATER V. CLEAR
0908	7.24	2.95	19.2	354	2.8	WATER V. CLEAR
0909	—	—	—	—	0.02	Reduce Flow
0910	—	—	—	—	0.02	Sample MW-983-
0915	—	—	—	—	—	SHUT Down Pump

Notes Sampling Procedures: Set pump @ 23' BTOC

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : IRL
Project Number : 15720250
Date : 8/15/96
Site Engineer : T. Blaney

Well Number : MW-10
Equipment : DXT-15CE YSI 3526
Solinst H2O Level Tape
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	76.57	TOC	76.57
Depth to Sediment (ft)	150.60	TOC	152.00
Thickness of Sediment (ft)	~~155~~ 4.4		4.4

Depth of Well (ft) 155
Diameter of Casing (ft) 0.333
Water Column Height (ft) 74.03
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 48.31
Casing Volumes Purged 1.35
Total Volume Purged (gals) 65.41

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0953					2.11	START Pump Set Control Box @ 272 Hz
1000	7.00	3.92	20.4	396	2.11	Water Ext. clear
1005	6.92	3.65	20.4	400	2.11	Water Ext. clear
1010	6.90	3.82	20.6	402	2.11	Water Ext. clear
1015	6.91	3.79	20.7	406	2.11	Water Ext. clear
1020	6.89	3.82	20.7	404	2.11	Water Ext. clear
1021	6.90	3.82	20.7	405	2.11	Water Ext. clear
1024	—	—	—	—	0.02	Primer Flow
1025	—	—	—	—	0.02	Sample MW-10-062
1030	—	—	—	—	0.02	Sample MW-10-061 (Dup)
1033	—	—	—	—	—	Shut Down Pump

Notes Sampling Procedures: Set pump @ 80 ft btoc

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JAC
Project Number : 15720258
Date : 7/31/98
Site Engineer : T. Gurney

Well Number : MW-13
Equipment : DET-ISCE
YSI 3500
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	170.78	BTOC	170.78
Depth to Sediment (ft)	234.90	BTOC	234.90
Thickness of Sediment (ft)	0.10		0.10

Depth of Well (ft) 235.0
Diameter of Casing (ft) 0.333
Water Column Height (ft) 64.12
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 41.77
Casing Volumes Purged 1.76
Total Volume Purged (gals) 73.44

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0825	—	—	—	—	2.16	START Pump, Control Box Set @ 38 Hz.
0830	7.40	3.0	21.6	554	2.16	Water V clear
0840	7.09	1.3	21.8	559	2.16	Water EXT clear
0845	6.97	1.6	23.0	556	2.16	Water EXT. clear
0850	7.00	1.0	21.9	553	2.16	Water EXT. clear
0853	7.01	1.0	21.7	552	2.16	Water EXT. clear
0856	7.01	1.0	21.9	552	2.16	Water EXT clear
0859	—	—	—	—	0.02	Reduce Flow
0900	—	—	—	—	0.02	Sample MW-983-049 (MW-13)
0910	—	—	—	—	0.02	Sample MW-983-018 (Dup @ MW-13)
0904	—	—	—	—	—	SHUT OFF Pump @ MW-13

Notes Sampling Procedures: Set pump @ 174' BTOC

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPC
Project Number : 1572 0250
Date : 8/6/98
Site Engineer : T. Blaney

Well Number : MW-15
Equipment : DRT-15CE, YSI 3500
Solinst H2O Level Meter
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	29.65	TOC	29.65
Depth to Sediment (ft)	74.90	TOC	74.90
Thickness of Sediment (ft)	0.10		0.10

Depth of Well (ft) 75
Diameter of Casing (ft) 0.333
Water Column Height (ft) 45.25
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 294
Casing Volumes Purged 2.75
Total Volume Purged (gals) 812

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1315					2.8	START Pump; Set Control Box @ 26 Hz
1320	7.04	12.1	19.4	332	2.8	Water clear
1325	7.13	4.72	19.7	320	2.8	water EXT. clear
1330	7.26	2.98	19.7	317	2.8	water EXT. clear
1335	7.28	2.99	19.7	317	2.8	water EXT. clear
1338	7.28	3.09	19.7	317	2.8	water ext. clear
1341	7.36	3.02	19.7	316	2.8	water EXT. clear
1344	—	—	—	—	0.02	Reduce Flow
1345	—	—	—	—	0.02	Sample MW-983-042
1350	—	—	—	—	—	START Down Pump

Notes Sampling Procedures: Set pump @ 33' BTOC

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0250
Date : 7/31/98
Site Engineer : T. BLANEY

Well Number : MW-16
Equipment : DGT-15CE
YSI 350
Contractor :

	Before	Reference Point	After
Depth to Water (ft)	223.52	TOC	223.52
Depth to Sediment (ft)	285.0	TOC	285.0
Thickness of Sediment (ft)	0		0

Depth of Well (ft) 285.0
Diameter of Casing (ft) 0.333
Water Column Height (ft) 61.48
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 40.05
Casing Volumes Purged 1.16
Total Volume Purged (gals) 46.41

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1045					1.19	START Pump. Control Box
						Set @ 350 Hz
1050	7.25	6.6	25.1	560	1.19	Water ~~SC~~ Clear
1055	7.08	3.4	24.2	535	1.19	water v. clear
1100	7.04	1.90	24.4	514	1.19	Water EXT. clear
1105	7.03	1.87	24.2	519	1.19	water EXT. Clear
1110	7.01	1.87	23.8	515	1.19	water EXT clear
1115	7.00	1.89	23.8	516	1.19	water EXT clear
1118	7.01	1.82	23.5	515	1.19	water EXT. clear
1121	7.01	1.86	23.5	516	1.19	water EXT. clear
1124	—	—	—	—	0.02	Reduce Flow
1125	—	—	—	—	0.02	Sample MW-983-041
1128	—	—	—	—	~~0~~	Shut Down pump

Notes Sampling Procedures:

F4

APPENDIX B

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

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name :	JPL	Well Number :	MW-3
Project Number :	1572-0250-0000	Equipment :	YSI 3500
Date :	7-27-98		DRT-15CE
Site Engineer :	M. Losi, D. Dirkin	Contractor :	

	Before	Reference Point	After
Depth to Water (ft)	* See Premise	Profile sheets	
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
0941	9.10	3.21	22.6	316	NA	Initial Parameters (1st Run) screen 5
1000	—	—	—	—	—	2nd Run. Collect MW-983-074
1032	9.16	5.10	24.4	344		3rd Run Collect MW-983-074. Final parameters
1115	8.34	3.11	24.0	363		1st Run @ Screen 4 (MW-3) Initial parameters (MW-983-075)
1145	—	—	—	—	NA	2nd Run Collect Sample MW-983-075
1220	8.28	4.73	24.7	367		3rd Run completed sample collection, & Final Parameters
1245	8.56	4.64	24.2	397	NA	1st Run @ Screen 3 (MW-3) Initial parameters (MW-983-076)
~~1315~~ 1330	—	—	—	—		2nd run collect sample MW-983-076
1354	8.84	4.91	25.4	390		3rd run completed sample collection & final parameters
1410	7.78	3.31	23.4	457	—	1st Run @ Screen 2. Initial Parameters (MW-983-077)
1440	—	—	—	—	—	2nd Run Collect MW-983-077
1500	7.63	3.41	24.3	475		3rd Run Completed Sample Collection, Final Parameters
1515	7.60	4.51	24.1	358	—	1st Run @ Screen 1, Initial Parameters (MW-983-78)
1540	—	—	—	—	—	2nd Run Collect Sample MW-983-078
1610						3rd Run, Collect Sample (MW-983-78), Final Params

Notes Sampling Procedures: ______

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0250
Date : 7-30-98
Site Engineer : D Dirkin

Well Number : MW-4
Equipment : YSI 3500
DRT-15CE
Contractor :

	Before	Reference Point	After
Depth to Water (ft)	* See Pressure Profile Sheet *		
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	9.8	4.62	21.9	368	NA	1ST RUN, INITIAL PARAM., MW-4 SCREEN 3
0855	—	—	—	—	NA	2nd RUN, COLLECT SAMPLE MW-983-0848
0925	7.91	4.67	23.0	386	NA	3rd RUN, COLLECT SAMPLE, + final parameters
1006	8.03	3.56	22.1	377	NA	1ST RUN, INITIAL PARAM.; MW 4 SCREEN 4
1020	—	—	—	—	NA	2nd RUN, COLLECT SAMPLE - MW-983-0941
1050	7.93	3.66	23.3	390	NA	3rd RUN, COLLECT SAMPLE - MW-983-0961 FINAL PARAMETERS
1117	8.24	3.86	22.6	393	NA	1ST RUN, INITIAL PARAM.; MW-4 SCREEN 2
1130	—	—	—	—	NA	2nd RUN, COLLECT SAMPLE MW-983-0978
1150	8.26	2.03	23.4	409	NA	3rd RUN COLLECT SAMPLE + FINAL PARAMETERS
1205	7.33	2.99	22.1	363	NA	1ST RUN, INITIAL PARAMETERS, MW-4 SCREEN 1
1225	—	—	—	—	NA	2nd RUN COLLECT SAMPLE, MW-983-0993
1245	8.02	3.58	18.9	344	NA	3rd RUN, COLLECT SAMPLE, FINAL PARAM.

Notes Sampling Procedures:

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0250
Date : 7/29/98
Site Engineer : T. Blaney

Well Number : MW-4
Equipment : YSI 3500
DRT-15CE
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	~~See Pressure Profiles sheets~~		
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
1333	8.19	4.85	25.5	781	—	1st Pump Sample #2
1345	—	—	—	—		Sample MW-9803-072
1445	—	—	—	—		Sample MW-9803-071
1450	8.00	10.6	22.5	776	—	Final Parameters

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0250.0000
Date : 7-28-94
Site Engineer : ____

Well Number : MW-11
Equipment : YSI 3500
DRT-15CE
Contractor : ____

	Before	Reference Point	After
Depth to Water (ft)	* See Pressure Profile Sheets		
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	8.39	1.74	22.0	339	NA	1st Run initial Parameters MW-11, Screen 5
0915	–	–	–	–	NA	2nd run, Collect MW-983-056, (MS/MSD)
1045	8.26	1.72	25.4	342	NA	3rd Run, complete Sample collection & final parameters
1130	8.24	3.73	24.1	391	NA	1st Run, initial Parameters MW-11, Screen 4
1055	–	–	–	–	NA	2nd Run, Collect MW-983-057
1120	8.21	4.81	23.5	377	NA	3rd Run
1150	7.10	2.63	23.5	420	NA	1st Run, initial Parameters, MW-11 Screen 3,
1215	–	–	–	–	NA	Collect Sample, MW-983-058
1240	8.00	0.94	23.6	425	NA	3rd Run, Complete Sample collection & final parameters
1239	8.00	3.45	23.0	448	NA	1st Run, initial Param., MW-11-2
1305	–	–	–	–	NA	2nd Run, Collect Sample MW-983-059
1350	7.87	3.54	24.4	463	NA	3rd Run, Collect Sample, Final Param.
1410	7.91	4.60	24.9	538	NA	1st Run, initial Parameters, MW-11, Screen 1
1425	–	–	–	–	NA	2nd Run Collect Sample - MW-983-060
1452	7.74	0.60	22.7	512	NA	3rd Run Collect Sample, Final Param.

Notes Sampling Procedures: ____

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : SPL
Project Number : 15720252
Date : 8/3/98
Site Engineer : T. Blaney

Well Number : MW-12
Equipment : YSI 3500
DRT-15CE
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	* See Presamp	Profile Sheets *	
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
0925	7.13	3.08	20.7	406	—	1ST Run Screen #5; Ready to Sample
0945						Sample MW-983-050
1029	7.73	2.18	21.8	419	-	Final Parameters
1050	8.88	3.70	20.8	432	-	1ST Run Screen #4; Ready to Sample
1110						Sample MW-983-051
1130	8.89	2.99	20.7	441	—	Final Parameters
1146	7.87	3.24	20.7	468	—	1ST Run Screen #3; Ready to Sample
						Sample MW-983-052
1220	7.79	2.76	20.6	462	—	Final Parameters
1238	8.18	3.70	23.5	510	—	1ST Run Screen #2; Ready to Sample
1255						Sample MW-983-05 4
1305						Sample MW-983-053 (Dup)
1310	8.20	4.07	23.7	516	—	Final Parameters
1328	8.58	86.0	24.7	457	-	1ST Run Screen #1; Reducing Turbidity
1340	7.54	75.0	22.5	444	—	2ND Run; Reducing Turb. Dit
1435	7.62	48.0	21.9	432	—	3RD Run; Reducing Turbidity

Notes Sampling Procedures:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572 0250
Date : 8/4/98
Site Engineer : T. BLANEY

Well Number : MW-12
Equipment : YSI 350
DRT-15CC
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	* See Pressure Profile Sheets *		
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
1040	7.36	4.99	25.8	483	—	12" Pump Screen at 1; Ready to Sample
1055						Sample MW-983-055
1115	7.32	8.20	24.3	485	—	Final Parameters

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0250
Date : 7/24/95
Site Engineer : J. BLENNER, T. BUANEY
Well Number : MW-14
Equipment : DRT-15CE
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PIEZOMETER SHEETS	PIEZOMETER SHEETS	
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
0935	8.53	2.40	20.1	341	—	1ST RUN TO SCREEN #5 INITIAL PARAMETERS
0900	—	—	—	—	—	COLLECT MW-983-043 (MS/MSD)
0920	8.53	2.23	20.2	306	—	3RD RUN TO SCREEN #5 FINAL PARAMETERS
0945	8.23	1.03	20.3	448	—	1ST RUN TO SCREEN #4 INITIAL PARAMETERS
1000	—	—	—	—	—	COLLECT MW-983-044
1020	8.14	1.10	20.9	465	—	3RD RUN TO SCREEN #4 FINAL PARAMETERS
1040	8.20	3.12	20.9	708	—	1ST RUN TO SCREEN #3 INITIAL PARAMETERS
1100	—	—	—	—	—	COLLECT MW-983-045
1115	8.22	2.52	21.6	727	—	3RD RUN TO SCREEN #3 FINAL PARAMETERS
1135	7.18	4.79	21.2	1149	—	1ST RUN TO SCREEN #2 INITIAL PARAMETERS
1155	—	—	—	—	—	COLLECT MW-983-046
1210	7.20	4.80	21.0	1160	—	3RD RUN TO SCREEN #2 FINAL PARAMETERS
1230	6.94	18.6	23.3	1212	—	1ST RUN TO SCREEN #1 INITIAL PARAMETERS
1245	6.96	14.56	23.4	1220	—	2ND RUN, ATTEMPTING TO REDUCE TURBIDITY
1307	6.74	21.5	23.7	1228	—	3RD RUN, TRY TO REDUCE TURBIDITY
1320	6.75	18.5	24.0	1246	—	4TH RUN, TRYING TO REDUCE TURB
1420	6.78	3.79	24.3	1239	—	COLLECT MW-983-047
1435	6.74	4.13	24.1	672 RS4	—	FINAL RUN TO SCREEN #1, FINAL PARAMETERS

Notes Sampling Procedures: ____

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572 0250
Date : 7/20/98
Site Engineer : T. BLANEY

Well Number : MW-17
Equipment : DRT-1SCE
YSI 3500
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	* See Pressure Profiles *		
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	7.87	12.5	18.7	442	—	1ST RUN TO SCREEN #5; INITIAL PARAMETERS
0930	8.01	20.1	18.8	375	—	2ND RUN; ATTEMPTING TO REDUCE TURBIDITY
0955	8.02	21.8	18.7	391	—	3RD RUN; TRYING TO REDUCE TURBIDITY
1025	8.02	4.78	18.8	396	—	COLLECT MW-983-036
1100	7.97	4.64	18.9	411	—	5TH RUN TO SCREEN #5 FINAL PARAMETERS
1130	7.90	4.37	18.9	394	—	1ST RUN TO SCREEN #4; INITIAL PARAMETERS
1145	—	—	—	—	—	COLLECT MW-983-037
1215	7.84	4.46	19.6	407	—	3RD RUN TO SCREEN #4 FINAL PARAMETERS
1230	9.03	1.01	19.2	270	—	1ST RUN TO SCREEN #2; INITIAL PARAMETERS
1250	—	—	—	—	—	COLLECT MW-983-039
1310	9.05	1.25	19.4	273	—	3RD RUN TO SCREEN #2; FINAL PARAMETERS
1335	7.54	1.40	19.9	283	—	1ST RUN TO SCREEN #1 INITIAL PARAMETERS
1345	—	—	—	—	—	COLLECT MW-983-040
1410	7.25	0.86	19.7	279	—	3RD RUN TO SCREEN #1; FINAL PARAMETERS

Notes Sampling Procedures:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0250
Date : 7/29/98
Site Engineer : T. BLANEY

Well Number : MW-17
Equipment : YSI 3500, DT-15CF
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	* See Pressure Profile Sheets *		
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
0910	7.96	3.95	21.7	402	—	1st Run @ Screen # 3; Ready to Sample
0935	—	—	—	—		Sample MW-983-038
1040	7.74	4.96	22.7	370	—	Final Parameters

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPC
Project Number : 1572 0250
Date : 7/17/98
Site Engineer : T. Bunch

Well Number : MW-18
Equipment : YSI 3500
DRT-15CE
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESSURE PROFILE SHEETS *		
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	8.16	1.06	20.4	264	—	1ST Run; INITIAL Parameters; Ready to Sample Screen #5
1010						Sample MW-983-031
1010						Sample MW-983-031 MS/MSD
1040	8.92	0.30	21.4	288	—	FINAL PARAMETERS
1115	7.98	2.47	20.5	361	—	1ST Run; Screen #4; Ready to Sample
1130						Sample MW-983-032
1155	7.96	2.17	21.0	373	—	FINAL Parameters
1222	7.89	2.27	20.4	460	—	1ST Run Screen #3; Ready to Sample
1240						Sample MW-983-033
1300	7.84	2.11	20.6	469	—	FINAL Parameters
1320	7.43	3.14	21.5	396	—	1ST Run Screen #2; Ready to Sample
1335						Sample MW-983-034
1350	7.27	3.02	21.6	399	—	FINAL PARAMETERS
1410	7.20	3.80	23.3	397	—	1ST Run Screen #1; Ready to Sample
1430						Sample MW-983-035
1455	7.02	2.91	22.0	388	—	FINAL Parameters

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : IPL
Project Number : 15720253
Date : 7/21/98
Site Engineer : T. BLANEY

Well Number : MW-19
Equipment : YSI 3500
DRT-15CE
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	* See pressure Profile Sheets *		
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
0828	7.65	4.78	19.9	733	—	1ST Run Screen #5; Ready to Sample
0850						Sample MW-983-026
0910	7.62	6.72	20.2	750	—	Final Parameters
0940	7.68	4.55	19.5	518	—	1ST Run Screen #4; Ready to Sample
0955						Sample MW-983-027
1015	7.57	3.99	20.2	526	—	Final Parameters
1040	7.34	3.87	20.9	831	—	1ST Run Screen #3; Ready to Sample
1100						Sample MW-983-028
1116	7.16	6.65	21.1	865	—	Final Parameters
1137	6.86	4.87	21.5	618	—	1ST Run Screen #2; Ready to Sample
1150						Sample MW-983-029
1205	6.83	4.92	21.3	617	—	Final Parameters
1228	7.47	4.91	22.7	284	—	1ST Run Screen #1; Ready to Sample
1240						Sample MW-983-030
1300	7.30	473	21.4	269	—	Final Parameters

Notes Sampling Procedures:

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0250
Date : 7/22/99
Site Engineer : J. BRENNAN, T. BLANEY

Well Number : MW-20
Equipment : YSI-3500
DIT-ISCO
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESS. PROFILE SHEETS		
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
0840	8.80	3.31	18.8	314	—	1ST RUN TO SCREEN #5 INITIAL PARAMETERS
0910	-	-	-	-	-	COLLECT MW-983-021
0955	8.93	1.73	19.7	320	—	3RD RUN TO SCREEN #5 FINAL PARAMETERS
1025	8.79	2.14	19.6	303	—	1ST RUN TO SCREEN #4 INITIAL PARAMETERS
1045	—	—	—	—	—	COLLECT MW-983-022
1110	8.77	2.08	20.3	307	—	3RD RUN TO SCREEN #4 FINAL PARAMETERS
1135	8.25	0.68	20.4	452	—	1ST RUN TO SCREEN #3 INITIAL PARAMETERS
1155	-	-	-	-	-	COLLECT MW-983-023
1215	8.19	1.06	20.2	460	—	3RD RUN TO SCREEN #3 FINAL PARAMETERS
1236	8.63	1.32	19.5	332	—	1ST RUN TO SCREEN #2 INITIAL PARAMETERS
1255	—	—	—	—		COLLECT MW-983-024
1310	7.83	1.45	20.7	394	-	3RD RUN; FINAL PARAMETERS
1330	7.65	3.23	22.1	717	—	1ST RUN TO SCREEN #1 INITIAL PARAMETERS
1345	—	-	-	-	—	COLLECT MW-983-025
1400	7.48	3.16	21.2	719	-	3RD RUN TO SCREEN #1 FINAL PARAMETERS

Notes Sampling Procedures:

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572 0250
Date : 7/23/98
Site Engineer : T. Blaney

Well Number : MW-21
Equipment : YSI 3520
DLT-15CE
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	* See Pressure Profile SHEETS *		
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
0837	7.86	11.2	19.8	715	—	1ST Run Screen #5, Reducing Turbidity
0857	7.91	19.4	19.8	726	—	2ND Run Screen #5; Reducing Turbidity
0916	7.87	26.6	19.8	727	—	3RD Run Screen #5; Reducing Turbidity
0937	7.83	4.2	19.9	732	—	Last Run Screen #5; Ready to Sample
0955						Sample MW-983-016
1010	7.72	7.7	21.1	752	—	Final Parameters
1030	7.29	2.42	20.9	874	—	1ST Run Screen #4; Ready to Sample
1045						Sample MW-983-017
1100	7.28	1.99	20.8	882	—	Final Parameters
1119	7.48	4.83	20.8	930	—	1ST Run Screen #3; Ready to Sample
1130						Sample MW-983-018
1148	7.37	4.89	21.1	967	—	Final Parameters
1203	7.10	3.85	21.3	1052	—	1ST Run Screen #2; Ready to Sample
1215						Sample MW-983-019
1228	6.94	4.56	21.9	1079	—	Final Parameters
1244	6.87	3.39	23.8	819	—	1ST Run Screen #1; Ready to Sample
1300						Sample MW-983-020
1310	6.92	2.99	23.2	821	—	Final Parameters

Notes Sampling Procedures: _____

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572 0250
Date : 8/10/98
Site Engineer : T. Blaney

Well Number : MW-22
Equipment : DRT-15CE
TSI 3500
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	* See Pressure Profile Sheets		
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	8.98	2.33	21.8	376	—	1ST Run Screen #5; Ready to Sample
0905						Sample MW-983-011
0928	8.99	3.15	21.8	370	—	Final Parameters
0947	7.93	6.20	21.7	342	—	1ST Run Screen #4; Reducing Turbidity
1009	7.91	3.95	21.8	346	—	2ND Run Screen #4; Ready to Sample
1010						Sample MW-983-012
1010						MW-983-012-MS
1010						MW-983-012-MSD
1028	7.88	3.65	21.9	349	—	Final Parameters
1057	8.18	4.85	21.6	475	—	1ST Run Screen #3; Ready to Sample
1115						Sample MW-983-013
1135	8.20	5.02	21.9	480		Final Parameters
1153	8.11	3.33	21.7	624	—	1ST Run Screen #2; Ready to Sample
						~~Sample MW-983-014~~
						Could not Sample due to
						Sample Pump Breakdown.

Notes Sampling Procedures: _____

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 15720250
Date : 8/11/98
Site Engineer : T. BLANEY

Well Number : MW-22
Equipment : DRT-15CE
YSI 3526
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	* See pressure profile sheets *		
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
1004	8.10	4.44	21.9	644	—	1ST Run Screen #2; Ready to Sample
1020						Sample MW-983-014
1045	7.96	7.51	22.1	656	—	Final Parameters
1240	7.83	4.84	22.9	1107	—	1ST Run Screen #1; Ready to Sample
1255						MW-983-015 (Sampled)
1325	7.77	5.64	23.2	1106	—	Final Parameters

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JBL
Project Number : 1572.0250.0000
Date : 8-13-98
Site Engineer : D. Dirkin & J. Blaney
Well Number : MW-23
Equipment : YSI 3500
DET-15CE
Contractor :

	Before	Reference Point	After
Depth to Water (ft)	* See Pressure	Profile Sheets *	
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
0857	9.44	1.71	22.4	547	NA	1ST Run TO Screen 5, initial parameters
0920	—	—	—	—	—	collect Sample mw-983-006 2nd Run
0944	9.55	2.21	23.4	526	NA	3rd Run, final parameters, collect sample
1007	8.76	4.56	22.4	358	NA	1ST Run TO SCREEN 4, initial parameters
1029	—	—	—	—	NA	2nd Run, collect Sample mw-983-006
1043	7.86	8.84	23.2	362	NA	3rd run, collect Sample and final parameters
1107	7.92	84.0	22.8	446	NA	1ST Run TO SCREEN 3, initial parameters
1120	—	60	—	—	NA	2nd run, attempting TO REDUCE NTUs 60
1220	—	26	—	—	NA	Third run reduce Turbidity (3rd run purge) NTUs = 26
1240	7.90	24	—	—	NA	5 Th run, reduce NTUs, NTU = 24
1305	7.93	14	24.	454	NA	6th run, reduce NTUs NTU =
1325	—	4.68	—	~~458~~ 500	NA	7th run, reduce Turbidity collect Sample mw-983-006
1335	7.82	12.2	23.6	458	NA	8th run collect sample & final parameters
1355	7.24	3.35	22.6	1084	NA	1ST Run, initial parameters (Screen 2)
1415	—	—	—	—	NA	2nd Run, collect Sample, mw-983-009
1425	7.12	4.68	24.3	1143	NA	3rd Run, collect Sample and final parameters
1444	7.15	4.01	23.1	540	NA	1ST Run to Screen 1 — initial parameters
1458	—	—	—	—	NA	2nd Run, collect Sample mw-983-016
1510	7.00	4.78	22.9	583	NA	3rd run, collect Sample & final parameters

Notes Sampling Procedures:

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0250
Date : 7/29/98
Site Engineer : T. Bunny

Well Number : MW-24
Equipment : YSI 3500
DRT-15CE
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	* See Pressure Profile sheets *		
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
1142	7.56	4.91	23.8	427	—	12E Rm. Screen #1. Ready to Sample
1200	—	—	—	—		Sample MW-98S-0005
1250	7.45	5.02	23.9	406	—	Final Parameters
			~~23.9~~			

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 15720250
Date : 8/4/98
Site Engineer : T. Blaney

Well Number : MW-24
Equipment : YSI 3500
DRT-15CE
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	* See Pressure Profile Sheets *		
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
1320	7.94	57.7	25.0	423	—	1st Pump Screen #5; Reducing Turbidity
1350	7.96	18.7	25.1	427	-	2nd Pump Screen #5; Reducing Turbidity
1412	7.95	3.99	25.0	426	-	3rd Pump Screen #5; Ready to Sample
1415						Sample MW-9803-001
1435	7.91	4.35	25.3	428	-	Final Parameters

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : IDL
Project Number : 15720250
Date : 8/7/98
Site Engineer : T. BLANEY

Well Number : MW-24
Equipment : DRT-15CE
YSI 3500
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	* See Pressure Profile Sheets *		
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
0912	8.05	4.82	21.9	356	—	1ST Run Screen #4; Ready to Sample
0930						Sample MW-983-0002
1000	8.10	12.72	22.6	364	—	Final Parameters
1012	7.84	25.1	22.5	441	—	1ST Run Screen #3; Reducing Turbidity
1051	7.81	20.1	22.7	443	—	2ND Run Screen #3; Reducing Turbidity
1117	7.79	15.2	22.8	448	—	3RD Run Screen #3; Reducing Turbidity
1138	7.79	4.86	22.6	449	—	4TH Run Screen #3; Ready to Sample
1140						Sample MW-983-0003
1203	7.78	10.5	22.4	449	—	Final Parameters
1222	8.29	14.2	23.5	392	—	1ST Run Screen #2; Reducing Turbidity
1245	8.32	4.82	24.0	393	—	2ND Run Screen #2; Ready to Sample
1245						Sample MW-983-0001
1302	8.28	5.67	24.5	393		Final Parameters

Notes Sampling Procedures: _____

F4

GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS
July 15, 1998

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-1		7/15/98	22.69	1116.69	1094.00
MW-3	1 (top)	7/15/98	89.75	1100.34	1010.59
	2	7/15/98	103.07	1100.34	997.27
	3	7/15/98	109.25	1100.34	991.09
	4	7/15/98	190.40	1100.34	909.94
	5	7/15/98	221.07	1100.34	879.27
MW-4	1 (top)	7/15/98	62.16	1082.84	1020.68
	2	7/15/98	83.45	1082.84	999.39
	3	7/15/98	88.65	1082.84	994.19
	4	7/15/98	98.94	1082.84	983.90
	5	7/15/98	177.58	1082.84	905.26
MW-5		7/15/98	50.08	1071.62	1021.54
MW-6		7/15/98	177.56	1188.54	1010.98
MW-7		7/15/98	195.71	1212.90	1017.19
MW-8		7/15/98	120.38	1139.55	1019.17
MW-9		7/15/98	19.51	1106.06	1086.55
MW-10		7/15/98	71.32	1087.73	1016.41
MW-11	1 (top)	7/15/98	102.12	1139.30	1037.18
	2	7/15/98	128.93	1139.30	1010.37
	3	7/15/98	147.74	1139.30	991.56
	4	7/15/98	159.25	1139.30	980.05
	5	7/15/98	216.66	1139.30	922.64
MW-12	1 (top)	7/15/98	78.83	1102.14	1023.31
	2	7/15/98	99.26	1102.14	1002.88
	3	7/15/98	104.55	1102.14	997.59
	4	7/15/98	121.22	1102.14	980.92
	5	7/15/98	184.13	1102.14	918.01
MW-13		7/15/98	167.93	1183.49	1015.56
MW-14	1 (top)	7/15/98	162.36	1173.47	1011.11
	2	7/15/98	163.49	1173.47	1009.98
	3	7/15/98	164.54	1173.47	1008.93
	4	7/15/98	164.89	1173.47	1008.58
	5	7/15/98	166.32	1173.47	1007.15
MW-15		7/15/98	29.25	1120.68	1091.43
MW-16		7/15/98	220.79	1236.29	1015.50
MW-17	1 (top)	7/15/98	175.84	1191.21	1015.37
	2	7/15/98	200.34	1191.21	990.87
	3	7/15/98	217.04	1191.21	974.17
	4	7/15/98	271.30	1191.21	919.91
	5	7/15/98	282.35	1191.21	908.86

GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS
July 15, 1998

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-18	1 (top)	7/15/98	228.66	1225.41	996.75
	2	7/15/98	230.67	1225.41	994.74
	3	7/15/98	236.25	1225.41	989.16
	4	7/15/98	269.49	1225.41	955.92
	5	7/15/98	287.86	1225.41	937.55
MW-19	1 (top)	7/15/98	141.72	1142.94	1001.22
	2	7/15/98	166.00	1142.94	976.94
	3	7/15/98	173.28	1142.94	969.66
	4	7/15/98	272.25	1142.94	870.69
	5	7/15/98	275.59	1142.94	867.35
MW-20	1 (top)	7/15/98	193.74	1165.05	971.31
	2	7/15/98	192.67	1165.05	972.38
	3	7/15/98	215.47	1165.05	949.58
	4	7/15/98	227.30	1165.05	937.75
	5	7/15/98	190.67	1165.05	974.38
MW-21	1 (top)	7/15/98	47.41	1059.10	1011.69
	2	7/15/98	48.32	1059.10	1010.78
	3	7/15/98	49.86	1059.10	1009.24
	4	7/15/98	51.70	1059.10	1007.40
	5	7/15/98	51.84	1059.10	1007.26
MW-22	1 (top)	7/15/98	164.13	1176.98	1012.85
	2	7/15/98	170.55	1176.98	1006.43
	3	7/15/98	170.97	1176.98	1006.01
	4	7/15/98	189.25	1176.98	987.73
	5	7/15/98	200.23	1176.98	976.75
MW-23	1 (top)	7/15/98	94.57	1108.84	1014.27
	2	7/15/98	104.45	1108.84	1004.39
	3	7/15/98	106.13	1108.84	1002.71
	4	7/15/98	129.76	1108.84	979.08
	5	7/15/98	130.38	1108.84	978.46
MW-24	1 (top)	7/15/98	184.24	1200.94	1016.70
	2	7/15/98	196.26	1200.94	1004.68
	3	7/15/98	201.35	1200.94	999.59
	4	7/15/98	228.10	1200.94	972.84
	5	7/15/98	250.89	1200.94	950.05

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: 7/15/98 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-4

Elevation of atum(ft msl): 1082.84 | Range: 0 to 750 psia | Weather: 90 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.16/24.39/1250 | Finish: 14.03/20.90/1302

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	125.67			24.05	1252		177.58	905.26
			159.52						
			159.49						
			159.49						
				125.71					
4	392	73.07			23.38	1254		98.94	983.90
			141.13						
			141.15						
			141.13						
				73.12					
3	322	42.72			21.88	1256		88.65	994.19
			115.26						
			115.24						
			115.26						
				42.70					
2	240	14.20			21.55	1258		83.45	999.39
			81.94						
			81.97						
			81.97						
				14.13					
1	150	14.12			21.12	1300		62.16	1020.68
			52.16						
			52.18						
			52.18						
				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: 7/15/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1100.34 | Range: 0 to 750 psia | Weather: 90 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.18/2.13/0935 | Finish: 14.06/20.13/0950

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	160.87			23.21	938		221.07	879.27
			201.38						
			201.35						
			201.35						
				160.92					
4	558	119.72			23.30	940		190.40	909.94
			173.45						
			173.47						
			173.50						
				119.71					
3	346	27.65			22.21	942		109.25	991.09
			116.78						
			116.71						
			116.76						
				27.69					
2	252	14.17			21.26	944		103.07	997.27
			78.67						
			78.70						
			78.67						
				14.20					
1	172	14.15			20.09	946		89.75	1010.59
			49.79						
			49.78						
			49.76						
				14.18					

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: 7/15/98 | Job No.: 1572

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

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

Weather: 90 degrees, Sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.07/28.18/1335 | Finish: 14.05/19.67/1350

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	157.51			23.76	1340		216.66	922.64
			197.13						
			197.15						
			197.15						
				157.53					
4	524	108.09			22.96	1342		159.25	980.05
			172.17						
			172.20						
			172.17						
				108.04					
3	429	67.28			21.88	1344		147.74	991.56
			136.01						
			135.97						
			135.98						
				67.25					
2	259	14.13			20.71	1346		128.93	1010.37
			70.44						
			70.46						
			70.44						
				14.17					
1	149	14.10			19.95	1348		102.12	1037.18
			34.39						
			34.37						
			34.39						
				14.12					

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: 7/15/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1102.14 | Range: 0 to 750 psia | Weather: 90 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.32/39.75/1235 | Finish: 14.10/21.14/1250

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	144.13			29.91	1240		184.13	918.01
			171.94						
			171.96						
			171.94						
				144.14					
4	436	95.48			26.31	1242		121.22	980.92
			150.64						
			150.67						
			150.69						
				95.53					
3	323	46.47			23.97	1244		104.55	997.59
			108.93						
			108.90						
			108.90						
				46.49					
2	243	14.01			22.04	1246		99.26	1002.88
			76.53						
			76.50						
			76.53						
				14.10					
1	140	14.03			21.37	1248		78.83	1023.31
			40.72						
			40.72						
			40.74						
				14.10					

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: 7/15/98 | Job No.: 1572

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

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

Weather: 90 degrees, Sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.18/31.00/1450 | Finish: 14.07/20.98/1500

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	142.02			26.83	1455		166.32	1007.15
			176.12						
			176.10						
			176.12						
				142.04					
4	456	105.46			23.77	1457		164.89	1008.58
			140.33						
			140.31						
			140.33						
				105.48					
3	382	73.41			22.45	1459		164.54	1008.93
			108.40						
			108.38						
			108.40						
				73.45					
2	277	27.89			21.59	1501		163.49	1009.98
			63.34						
			63.32						
			63.34						
				27.86					
1	207	14.10			21.02	1503		162.36	1011.11
			33.47						
			33.49						
			33.47						
				14.14					

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: 7/15/98 | Job No.: 1572

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

Elevation of datum(ft msl): 1191.21 | Range: 0 to 750 psia | Weather: 90 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.12/19.58/0748 | Finish: 14.02/16.49/0755

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	171.92			22.15	748		282.35	908.86
			206.40						
			206.38						
			206.40						
				171.94					
4	582	109.42			20.68	750		271.30	919.91
			148.75						
			148.78						
			148.75						
				109.41					
3	468	59.84			18.53	751		217.04	974.17
			122.85						
			122.88						
			122.85						
				59.86					
2	370	17.34			19.70	753		200.34	990.87
			87.63						
			87.60						
			87.62						
				17.31					
1	250	14.12			16.65	755		175.84	1015.37
			46.21						
			46.23						
			46.21						
				14.14					

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: 7/15/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1225.41 | Range: 0 to 750 psia | Weather: 90 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.07/19.03/0820 | Finish: 14.22/17.91/0832

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	148.91			20.54	822		287.86	937.55
			185.88						
			185.86						
			185.88						
				148.94					
4	564	96.84			20.89	824		269.49	955.92
			141.81						
			141.79						
			141.84						
				96.86					
3	424	36.03			19.77	826		236.25	989.16
			95.51						
			95.53						
			95.56						
				36.00					
2	330	14.17			18.91	828		230.67	994.74
			57.20						
			57.22						
			57.20						
				14.22					
1	270	14.14			18.17	830		228.65821	996.75179
			32.04						
			32.09						
			32.07						
				14.17					

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: 7/15/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1142.94 | Range: 0 to 750 psia | Weather: 90 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.15/22.46/0910 | Finish: 14.07/18.07/0923

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	80.92			20.67	913		275.59	867.35
			110.51						
			110.54						
			110.53						
				80.93					
4	444	57.45			19.45	915		272.25	870.69
			88.57						
			88.55						
			88.57						
				57.47					
3	392	34.90			18.85	917		173.28	969.66
			108.93						
			108.90						
			108.95						
				34.92					
2	314	14.19			18.42	919		166.00	976.94
			78.26						
			78.26						
			78.28						
				14.22					
1	242	14.14			18.24	921		141.72	1001.22
			57.59						
			57.56						
			57.59						
				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: 7/15/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1165.05 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

Weather: 90 degrees, Sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.12/19.67/0845 | Finish: 14.02/17.88/0858

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	265.76			21.61	848		190.67	974.38
			321.55						
			321.57						
			321.58						
				265.77					
4	700	179.01			22.17	850		227.30	937.75
			219.01						
			218.96						
			218.99						
				179.00					
3	562	118.90			21.51	852		215.47	949.58
			164.31						
			164.28						
			164.28						
				118.94					
2	392	45.13			19.83	854		192.67	972.38
			100.49						
			100.46						
			100.49						
				45.17					
1	230	14.07			18.35	856		193.74	971.31
			29.78						
			29.80						
			29.78						
				14.09					

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: 7/15/98 | Job No.: 1572

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

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

Weather: 90 degrees, Sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.07/30.05/1530 | Finish: 14.10/20.51/1542

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	131.81			25.40	1532		51.84	1007.26
			152.88						
			152.86						
			152.88						
				131.78					
4	310	104.87			23.33	1534		51.70	1007.40
			126.05						
			126.08						
			126.05						
				104.87					
3	240	74.92			22.10	1536		49.86	1009.24
			96.53						
			96.50						
			96.50						
				74.93					
2	161	40.57			21.18	1538		48.32	1010.78
			62.95						
			62.92						
			62.92						
				40.54					
1	90	14.10			20.55	1540		47.412534	1011.6875
			32.54						
			32.56						
			32.54						
				14.17					

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: 7/15/98 | Job No.: 1572

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

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

Weather: 90 degrees, Sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.21/27.30/1420 | Finish: 14.16/22.94/1432

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	166.43			25.47	1422		200.23	976.75
			182.28						
			182.30						
			182.27						
				166.47					
4	467	113.92			23.59	1424		189.25	987.73
			134.58						
			134.61						
			134.58						
				113.96					
3	389	80.03			22.96	1426		170.97	1006.01
			108.72						
			108.68						
			108.70						
				80.03					
2	329	53.99			22.33	1428		170.55	1006.43
			82.88						
			82.86						
			82.88						
				54.01					
1	245	17.27			23.45	1430		164.13	1012.85
			49.22						
			49.25						
			49.25						
				17.26					

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: 7/15/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1108.84 | Range: 0 to 750 psia | Weather: 90 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.07/25.31/1315 | Finish: 14.12/21.01/1327

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	162.70			24.17	1317		130.38	978.46
			192.51						
			192.56						
			192.53						
				162.67					
4	445	120.58			23.30	1319		129.76	979.08
			150.74						
			150.76						
			150.76						
				120.53					
3	319	65.91			22.31	1321		106.13	1002.71
			106.35						
			106.40						
			106.37						
				65.93					
2	254	37.67			21.65	1323		104.45	1004.39
			78.94						
			78.92						
			78.92						
				37.69					
1	174	14.15			21.06	1325		94.57	1014.27
			48.52						
			48.55						
			48.52						
				14.17					

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: 7/15/98 | Job No.: 1572

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

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

Weather: 90 degrees, Sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.27/25.56/1355 | Finish: 14.12/21.01/1410

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	188.53			24.34	1400		250.89	950.05
			199.34						
			199.36						
			199.34						
				188.55					
4	554	134.71			23.53	1402		228.10	972.84
			155.46						
			155.48						
			155.48						
				134.72					
3	435	83.03			23.02	1404		201.35	999.59
			115.49						
			115.47						
			115.49						
				83.05					
2	373	55.99			22.62	1406		196.26	1004.68
			90.79						
			90.82						
			90.82						
				56.02					
1	279	15.47			21.17	1408		184.24	1016.70
			55.28						
			55.26						
			55.28						
				15.44					

GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS
August 17, 1998

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-1		8/17/98	23.68	1116.69	1093.01
MW-3	1 (top)	8/17/98	94.05	1100.34	1006.29
	2	8/17/98	110.19	1100.34	990.15
	3	8/17/98	116.01	1100.34	984.33
	4	8/17/98	199.65	1100.34	900.69
	5	8/17/98	228.71	1100.34	871.63
MW-4	1 (top)	8/17/98	72.31	1082.84	1010.53
	2	8/17/98	91.26	1082.84	991.58
	3	8/17/98	96.06	1082.84	986.78
	4	8/17/98	106.21	1082.84	976.63
	5	8/17/98	187.44	1082.84	895.40
MW-5		8/17/98	60.88	1071.62	1010.74
MW-6		8/17/98	182.49	1188.54	1006.05
MW-7		8/17/98	203.10	1212.90	1009.80
MW-8		8/17/98	128.20	1139.55	1011.35
MW-9		8/17/98	20.61	1106.06	1085.45
MW-10		8/17/98	80.11	1087.73	1007.62
MW-11	1 (top)	8/17/98	106.49	1139.30	1032.81
	2	8/17/98	135.71	1139.30	1003.59
	3	8/17/98	154.19	1139.30	985.11
	4	8/17/98	164.87	1139.30	974.43
	5	8/17/98	225.53	1139.30	913.77
MW-12	1 (top)	8/17/98	86.71	1102.14	1015.43
	2	8/17/98	105.53	1102.14	996.61
	3	8/17/98	110.50	1102.14	991.64
	4	8/17/98	126.88	1102.14	975.26
	5	8/17/98	191.78	1102.14	910.36
MW-13		8/17/98	174.99	1183.49	1008.50
MW-14	1 (top)	8/17/98	165.95	1173.47	1007.52
	2	8/17/98	167.10	1173.47	1006.37
	3	8/17/98	168.11	1173.47	1005.36
	4	8/17/98	168.32	1173.47	1005.15
	5	8/17/98	169.71	1173.47	1003.76
MW-15		8/17/98	30.16	1120.68	1090.52
MW-16		8/17/98	227.65	1236.29	1008.64
MW-17	1 (top)	8/17/98	175.71	1191.21	1015.50
	2	8/17/98	205.46	1191.21	985.75
	3	8/17/98	220.47	1191.21	970.74
	4	8/17/98	280.21	1191.21	911.00
	5	8/17/98	290.69	1191.21	900.52

GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS
August 17, 1998

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-18	1 (top)	8/17/98	232.21	1225.41	993.20
	2	8/17/98	234.39	1225.41	991.02
	3	8/17/98	241.04	1225.41	984.37
	4	8/17/98	276.57	1225.41	948.84
	5	8/17/98	296.73	1225.41	928.68
MW-19	1 (top)	8/17/98	150.94	1142.94	992.00
	2	8/17/98	172.15	1142.94	970.79
	3	8/17/98	179.85	1142.94	963.09
	4	8/17/98	283.82	1142.94	859.12
	5	8/17/98	287.32	1142.94	855.62
MW-20	1 (top)	8/17/98	197.69	1165.05	967.36
	2	8/17/98	196.93	1165.05	968.12
	3	8/17/98	219.06	1165.05	945.99
	4	8/17/98	235.49	1165.05	929.56
	5	8/17/98	195.10	1165.05	969.95
MW-21	1 (top)	8/17/98	52.95	1059.10	1006.15
	2	8/17/98	53.50	1059.10	1005.60
	3	8/17/98	54.79	1059.10	1004.31
	4	8/17/98	56.38	1059.10	1002.72
	5	8/17/98	56.69	1059.10	1002.41
MW-22	1 (top)	8/17/98	170.36	1176.98	1006.62
	2	8/17/98	176.51	1176.98	1000.47
	3	8/17/98	176.57	1176.98	1000.41
	4	8/17/98	195.43	1176.98	981.55
	5	8/17/98	206.67	1176.98	970.31
MW-23	1 (top)	8/17/98	101.99	1108.84	1006.85
	2	8/17/98	111.30	1108.84	997.54
	3	8/17/98	112.71	1108.84	996.13
	4	8/17/98	136.58	1108.84	972.26
	5	8/17/98	136.91	1108.84	971.93
MW-24	1 (top)	8/17/98	191.75	1200.94	1009.19
	2	8/17/98	203.46	1200.94	997.48
	3	8/17/98	208.25	1200.94	992.69
	4	8/17/98	234.99	1200.94	965.95
	5	8/17/98	258.61	1200.94	942.33

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: 8/17/98 | Job No.: 1572

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

Elevation of atum(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: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.04/21.40/1321 | Finish: 14.02/20.50/1331

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	160.72			23.45	1323		228.71	871.63
			197.97						
			197.94						
			197.97						
				160.69					
4	558	119.40			23.90	1325		199.65	900.69
			169.36						
			169.39						
			169.38						
				119.37					
3	346	27.29			22.67	1327		116.01	984.33
			113.76						
			113.72						
			113.71						
				27.32					
2	252	13.95			21.80	1329		110.19	990.15
			75.53						
			75.49						
			75.50						
				13.98					
1	172	13.92			20.97	1330		94.05	1006.29
			47.84						
			47.81						
			47.82						
				13.90					

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: 8/17/98 | Job No.: 1572

Serial No.: 1455 | Well Name: MW-4

Elevation of atum(ft msl): 1082.84 | Range: 0 to 750 psia | Weather: 85 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.15/20.45/1403 | Finish: 14.13/21.40/1410

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	125.52			21.81	1405		187.44	895.40
			155.27						
			155.24						
			155.30						
				125.49					
4	392	72.75			22.34	1407		106.21	976.63
			138.03						
			138.05						
			138.01						
				72.78					
3	322	42.33			22.17	1408		96.06	986.78
			112.07						
			112.10						
			112.09						
				42.36					
2	240	13.89			21.57	1409		91.26	991.58
			78.60						
			78.65						
			78.61						
				13.84					
1	150	13.96			21.02	1410		72.31	1010.53
			47.85						
			47.80						
			47.81						
				13.93					

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: 8/17/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1139.30 | Range: 0 to 750 psia | Weather: 85 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.15/23.79/1435 | Finish: 14.02/19.81/1450

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	157.29			22.85	1437		225.53	913.77
			193.34						
			193.30						
			193.33						
				157.28					
4	524	107.78			22.50	1439		164.87	974.43
			169.77						
			169.79						
			169.75						
				107.76					
3	429	66.79			22.05	1441		154.19	985.11
			133.21						
			133.23						
			133.20						
				66.82					
2	259	13.96			20.71	1445		135.71	1003.59
			67.52						
			67.55						
			67.53						
				14.01					
1	149	13.99			20.01	1447		106.49	1032.81
			32.50						
			32.53						
			32.51						
				14.33					

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: 8/17/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1102.14 | Range: 0 to 750 psia | Weather: 85 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.73/24.05/1340 | Finish: 14.10/24.13/1352

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	174.90			21.41	1342		191.78	910.36
			168.36						
			168.33						
			168.32						
				174.88					
4	436	126.01			21.47	1344		126.88	975.26
			147.92						
			147.93						
			147.90						
				126.00					
3	323	76.89			20.41	1346		110.50	991.64
			106.02						
			106.05						
			106.03						
				76.90					
2	243	42.12			19.23	1348		105.53	996.61
			73.50						
			73.53						
			73.50						
				42.15					
1	140	14.15			18.56	1350		86.71	1015.43
			37.01						
			37.00						
			37.04						
				14.08					

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: 8/17/98 | Job No.: 1572

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

Elevation of atum(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: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.46/24.72/1450 | Finish: 13.86/20.64/1608

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	151.59			23.29	1600		169.71	1003.76
			174.19						
			174.16						
			174.19						
				151.59					
4	456	115.02			22.58	1602		168.32	1005.15
			138.37						
			138.39						
			138.35						
				115.02					
3	382	82.76			21.72	1603		168.11	1005.36
			106.38						
			106.39						
			106.37						
				82.76					
2	277	37.08			21.18	1605		167.10	1006.37
			61.30						
			61.29						
			61.31						
				37.08					
1	207	13.99			20.93	1607		165.95	1007.52
			31.45						
			31.49						
			31.43						
				13.99					

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: 8/17/98 | Job No.: 1572

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

Elevation of atum(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: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.73/21.63/0810 | Finish: 13.92/16.91/0821

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	171.64			21.40	814		290.69	900.52
			202.56						
			202.52						
			202.51						
				171.62					
4	582	108.98			20.18	816		280.21	911.00
			144.62						
			144.65						
			144.68						
				109.03					
3	468	59.50			18.77	818		220.47	970.74
			121.12						
			121.15						
			121.12						
				59.52					
2	370	16.83			17.75	819		205.46	985.75
			85.17						
			85.14						
			85.15						
				16.89					
1	250	14.22			17.17	820		175.71	1015.50
			46.04						
			46.01						
			46.04						
				14.23					

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: 8/17/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1225.41 | Range: 0 to 750 psia | Weather: 85 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.87/19.43/0830 | Finish: 14.11/18.18/0845

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	148.75			21.26	835		296.73	928.68
			181.87						
			181.88						
			181.87						
				148.72					
4	564	96.49			21.46	837		276.57	948.84
			138.58						
			138.61						
			138.58						
				96.51					
3	424	35.67			19.90	839		241.04	984.37
			93.31						
			93.28						
			93.32						
				35.68					
2	330	14.36			18.83	841		234.39	991.02
			55.42						
			55.45						
			55.44						
				14.31					
1	270	14.21			18.42	843		232.21453	993.19547
			30.36						
			30.39						
			30.36						
				14.17					

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: 8/17/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1142.94 | Range: 0 to 750 psia | Weather: 85 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.97/28.74/1245 | Finish: 14.08/19.84/1257

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	81.69			24.06	1247		287.32	855.62
			105.36						
			105.35						
			105.36						
				81.66					
4	444	58.21			21.88	1249		283.82	859.12
			83.44						
			83.48						
			83.47						
				58.24					
3	392	35.60			22.32	1251		179.85	963.09
			105.99						
			105.98						
			106.01						
				35.58					
2	314	14.11			20.47	1253		172.15	970.79
			75.50						
			75.54						
			75.51						
				14.15					
1	242	14.08			20.04	1255		150.94	992.00
			53.52						
			53.49						
			53.49						
				14.12					

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: 8/17/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1165.05 | Range: 0 to 750 psia | Client: Jet Propulsion Laboratory

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

Operator: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.84/19.87/0858 | Finish: 13.91/29.20/1240

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	265.60			22.45	901		195.10	969.95
			319.48						
			319.44						
			319.43						
				265.60					
4	700	178.40			22.78	904		235.49	929.56
			215.23						
			215.26						
			215.23						
				178.43					
3	562	118.48			21.35	907		219.06	945.99
			162.55						
			162.52						
			162.55						
				118.46					
2	392	44.55			19.95	910		196.93	968.12
			98.45						
			98.42						
			98.45						
				44.52					
1	230	14.01			28.90	1237		197.69	967.36
			27.90						
			27.84						
			27.91						
				13.98					

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: 8/17/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1059.10 | Range: 0 to 750 psia | Weather: 85 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 12.92/30.38/1630 | Finish: 14.30/20.55/1643

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	131.52			24.66	1632		56.69	1002.41
			150.31						
			150.28						
			150.30						
				131.57					
4	310	104.62			23.21	1634		56.38	1002.72
			123.54						
			123.57						
			123.55						
				104.66					
3	240	74.69			21.89	1636		54.79	1004.31
			93.90						
			93.88						
			93.91						
				74.69					
2	161	40.30			20.93	1638		53.50	1005.60
			60.22						
			60.19						
			60.22						
				40.30					
1	90	14.02			20.60	1640		52.952712	1006.1473
			29.65						
			29.68						
			29.68						
				14.01					

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: 8/17/98 | Job No.: 1572

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

Elevation of datum(ft msl): 1176.98 | Range: 0 to 750 psia | Weather: 85 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.77/24.92/1530 | Finish: 14.30/21.22/1542

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	166.11			23.69	1532		206.67	970.31
			179.35						
			179.32						
			179.35						
				166.10					
4	467	113.47			23.20	1534		195.43	981.55
			131.75						
			131.78						
			131.75						
				113.50					
3	389	79.60			22.43	1536		176.57	1000.41
			106.12						
			106.13						
			106.12						
				79.61					
2	329	53.51			21.85	1538		176.51	1000.47
			80.13						
			80.16						
			80.13						
				53.55					
1	245	16.57			21.32	1540		170.36	1006.62
			46.40						
			46.37						
			46.40						
				16.57					

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: 8/17/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1108.84 | Range: 0 to 750 psia | Weather: 85 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.17/23.02/1412 | Finish: 14.00/20.89/1425

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	175.68			22.81	1414		136.91	971.93
			189.68						
			189.71						
			189.68						
				175.74					
4	445	133.53			22.58	1416		136.58	972.26
			147.77						
			147.81						
			147.78						
				133.61					
3	319	78.85			21.96	1418		112.71	996.13
			103.52						
			103.51						
			103.50						
				78.83					
2	254	50.53			21.45	1420		111.30	997.54
			75.95						
			75.93						
			75.96						
				50.50					
1	174	15.73			21.04	1422		101.99	1006.85
			45.29						
			45.31						
			45.30						
				15.75					

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: 8/17/98 | Job No.: 1572

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

Elevation of atum(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: J. Brenner, M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.23/20.70/1510 | Finish: 14.20/20.80/1523

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	188.97			23.29	1511		258.61	942.33
			196.03						
			196.03						
			196.00						
				188.90					
4	554	133.99			22.59	1519		234.99	965.95
			152.50						
			152.52						
			152.50						
				133.98					
3	435	82.08			22.58	1520		208.25	992.69
			112.46						
			112.52						
			112.55						
				82.10					
2	373	55.26			22.51	1522		203.46	997.48
			87.69						
			87.72						
			87.72						
				55.27					
1	279	14.38			22.26	1523		191.75	1009.19
			52.04						
			52.02						
			52.05						
				14.39					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 172 Date: 7/27/98

Well Name: MW-3 Sampling Zone No.: SCREEN 1 Starting Time: 1515 Finishing Time: 1615

Technicians M. GOSI & D. DIRKIN

Water Level Inside MP Casing (Beginning of Session) ~~PSIA~~ mm 14.14 psia (End of Session) ~~PSIA~~ 14.15 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	✓	✓	✓	✓	✓	✓	14.14 mm ~~PSIA~~	✓	1515	1518	✓	14.13	1	1ST RUN, INITIAL PARAMETERS, RINSE BOTTLES W/ FORMATION WATER
2	✓	✓	✓	✓	✓	✓	14.18	✓	1535	1541	✓	14.09	1	2ND RUN COLLECT MW-983-078 VOAS, METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	14.20	✓	1558	1604	✓	14.15	1	3RD RUN, COLLECT MW-983-078 Fe(II), ClO4, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: OUTSIDE PRESSURE 49.00

Total

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 252 Date: 7/27/95

Well Name: MW-3 Sampling Zone No.: Screen 2 Starting Time: 1410 Finishing Time: 1500

Technicians MLOSL & D DIKKEN

Water Level Inside MP Casing (Beginning of Session) 14.25 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	✓	✓	✓	✓	✓	✓	14.28	✓	14.16	1419	✓	14.17	1	1st RUN, NITRAT PARAMETERS FILL BOTTLES W/FIELD WATER
2	✓	✓	✓	✓	✓	✓	14.25	✓	1430	1433	✓	14.20	1	2ND RUN, SAMPLE MW-983-077 VOCs, METALS, ANIONS, ½ C (U.)
3	✓	✓	✓	✓	✓	✓	14.28	✓	1453	1456	✓	14.18	1	3RD RUN, SAMPLE MW-983-077 ½ C.(U), CLEAN, FOR ALL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: OUTSIDE PRESSURE: 77-83

Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL   Location: MW-3   Depth: 346   Date: 7-27-98

Well Name: MW-3   Sampling Zone No.: Screen 3   Starting Time: 1245   Finishing Time: 1400

Technicians M. Losi & D. Dirkid

Water Level Inside MP Casing (Beginning of Session) 29.36 psia   (End of Session) 29.3 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	✓	✓	✓	✓	✓	✓	29.36	✓	1234	1236 13[illegible]	✓	29.36	1	1st run; initial parameters NTU = 4.99
2	✓	✓	✓	✓	✓	✓	29.36	✓	1259	1300	✓	29.41	1	2nd run, collect sample MW-983-076, VOCs, metals, Anions, ½ Cr+6
3	✓	✓	✓	✓	✓	✓	29.37	✓	1352	1355	✓	29.38	1	3rd run, collect sample MW-983-076, ½ Cr+6, ClO4, Final parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: Water Level Outside MP: 115.79

Total Volume: 3.0 L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 558 Date: 7-27-95

Well Name: MW-3 Sampling Zone No.: SCREEN 4 Starting Time: 1052 Finishing Time: 1215

Technicians M. Losi, D. Dickard

Water Level Inside MP Casing (Beginning of Session) 121.48 BTR (End of Session) 121.51 BTR

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	✓	✓	✓	✓	✓	✓	121.48	✓	1100	1102	✓	121.55	1	1st run, Initial parameters. NTUs = 3.11
2	✓	✓	✓	✓	✓	✓	121.46	✓	1128	1131	✓	121.51	1	2nd run, collect sample MW-95-275, VOCs, metals, Anions + ½ cont.
3	✓	✓	✓	✓	✓	✓	121.47	✓	1158	1159	✓	121.51	1	3rd run, Cntl, clay and final parameter, NTUs = 4.23
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: Water level outside MP = 172.37

Total Volume: 3

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 653' Date: 7-27-98

Well Name: MW-3 Sampling Zone No.: Screen 5 Starting Time: 0915 Finishing Time: 1027

Technicians: M. Losi, D. Durkin

Water Level Inside MP Casing (Beginning of Session) 162.96 psia (End of Session) 162.89 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	✓	✓	✓	✓	✓	✓	162.96	✓	0925	0926	✓	162.92	1	1st Run, Initial Parameters NTUs = 3.21
2	✓	✓	✓	✓	✓	✓	162.91	✓	0954	0956	✓	162.89	1	2nd Run, Collect MW-983-074, VOCs, metals, Anions, ½ Cr+6 (Sample MW-983-074)
3	✓	✓	✓	✓	✓	✓	162.89	✓	1027	1029	✓	162.92	1	3rd Run Collect Cr+6, ClO4, Final Parameters, NTUs = 5.10
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: Water Pressure outside MP: 200.53

Total Volume: 3 l

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 150 Date: 7-30-98

Well Name: MW-4 Sampling Zone No.: SCREEN 1 Starting Time: 1201 Finishing Time: 1245

Technicians N. Losi, D. Dickin & T Blarney

Water Level Inside MP Casing (Beginning of Session) 14.23 PSIA (End of Session) 14.23 (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	✓	✓	✓	✓	✓	✓	14.23	✓	1203	1207	✓	14.13	1	1ST RUN, INITIAL PARAMETERS, NTUs = 3,492
2	✓	✓	✓	✓	✓	✓	14.20	✓	1218	1223	✓	14.16	1	2ND RUN, COLLECT SAMPLE, VOCs, METALS, ANIONS, 1/2 CATTLE
3	✓	✓	✓	✓	✓	✓	14.30	✓	1235	1238	✓	14.23	0.5	3RD RUN, COLLECT SAMPLE, CATS, CLEAN & FINAL PARAMETERS NTUs = 358
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: WP outside mp = 50.49

Total Volume: 2.5L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 240 Date: 7/29/98

Well Name: MW-4 Sampling Zone No.: 2 Starting Time: 1315 Finishing Time: 1450

Technicians M. Losi, T. Blaney

Water Level Inside MP Casing (Beginning of Session) 14.16 psia (ATmospheric) (End of Session) 14.03 psia (ATmospheric)

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	✓	1323	1326	✓	14.07	1	1st Run INITIAL Parameters NTUs = 4.85 Ready to Sample
2	✓	✓	✓	✓	✓	✓	14.11	✓	1338	1341	✓	14.03	1	Sample MW-983-072 VOAs ½ 1,40 amber Sample MW-983-071 VOAs
3	✓	✓	✓	✓	✓	✓	14.13	✓	1355	1358	✓	14.07	1	Sample MW-983-072 ½ 1,40 amber ½ NO3
4	✓	✓	✓	✓	✓	✓	14.10	✓	1409	1413	✓	14.03	1	Sample MW-983-072 ½ NO3 metals Sample MW-983-071 metals
5	✓	✓	✓	✓	✓	✓	14.07	✓	1426	1429	✓	14.00	1	Sample MW-983-072 Anions Cr+6 Sample MW-983-071 Cr+6
6	✓	✓	✓	✓	✓	✓	14.05	✓	1441	1444	✓	14.03	0.75	Sample MW-983-072 ClO4 + Final Parameters Sample MW-983-071 ClO4
7														
8														
9														
10														
11														
12														

Comments: 80.44 psia outside CASING

Total Volume: 5.75 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 322 Date: 7-30-18

Well Name: MW-4 Sampling Zone No.: SCREEN 3 Starting Time: 1058 Finishing Time: 1150

Technicians M. LOSI & D. DIRISIO

Water Level Inside MP Casing (Beginning of Session) 44.51 PSIA (End of Session) 44.45 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	✓	✓	✓	✓	✓	✓	44.51	✓	1102	1105	✓ 44.50	44.50	1	1st RUN, INITIAL parameters, NTUs = 3.86
2	✓	✓	✓	✓	✓	✓	44.48	✓	1121	1125	✓	44.45	1	2nd RUN collect sample, VOCs, metals, anions, & 1/2 Cr6
3	✓	✓	✓	✓	✓	✓	44.44	✓	1142	1145	✓	44.45	1	3rd RUN, collect sample, Cr6, Clo4 & Field Parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: WP outside of MP = 113.71

Total Volume: 3 l

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 392 Date: 7 30 98

Well Name: MW-4 Sampling Zone No.: Screen 4 Starting Time: 0936 Finishing Time: 1055

Technicians M. Losi & D. Dirkin

Water Level Inside MP Casing (Beginning of Session) 75.01 PSIA (End of Session) 75.00 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	✓	✓	✓	✓	✓	✓	75.01	✓	0951	0953	✓	75.06	1	1st Run initial parameters. NTU = 3.56
2	✓	✓	✓	✓	✓	✓	75.04	✓	1011	1013	✓	75.01	1	2nd Run, collect sample, VOCs, metals, Anions, [illegible] (MS/MSD for VOCs & metals)
3	✓	✓	✓	✓	✓	✓	75.01	✓	1037	1041	✓	75.00	1	3rd run, collect sample, Cr+6, ClO4 final param. NTU = 3.60
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: WL outside MP = 139.62

Total Volume: 3 l

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 513' Date: 7-30-98

Well Name: MW-4 Sampling Zone No.: Screen 5 Starting Time: 0811 Finishing Time: 0925

Technicians M. Losi & D. Dirkin

Water Level Inside MP Casing (Beginning of Session) 127.70 PSIA (End of Session) 126.66* (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	✓	✓	✓	✓	✓	✓	127.70	✓	0817	0823	✓	127.71	1	1ST Run, Initial Parameters NTU: 4.62
2	✓	✓	✓	✓	✓	✓	127.72	✓	0846	0851	✓	127.68	1	2nd Run, Collect Sample, Vol, metals, Anions, ½ Cont
3	✓	✓	✓	✓	✓	✓	126.65*	✓	0913	0917	✓	126.66*	.5	3rd Run, Collect Sample Cont Clay and Final Param. NTU: 4.67
4														
5														
6														
7														
8														✓
9														
10														
11														
12														

F2

Comments: Water Remove outside MP = 156.32

* Only 2 Sample Bottles

Total Volume: 2½ L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JAL Location: MW-11 Depth: 149 Date: 7-28-98

Well Name: MW-11 Sampling Zone No.: SCREEN 1 Starting Time: 1355 Finishing Time: 1445

Technicians M. Losi & D. Dirkin

Water Level Inside MP Casing (Beginning of Session) 14.30 PSIA (End of Session) 14.06 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	✓	✓	✓	✓	✓	✓	14.30	✓	1357	1406	✓	14.06	1	1ST Run, INITIAL PARAMETERS NTUs = 7.60
2	✓	✓	✓	✓	✓	✓	14.28	✓	1417	1424	✓	14.08	1	2nd run, COLLECT SAMPLES VOCs, METALS, ANIONS & VOC CHK
3	✓	✓	✓	✓	✓	✓	14.21	✓	1438	1422	✓	14.06	1	3rd run, COLLECT SAMPLE, CHK, CLAY & FINAL PARAMETERS. NTUs = 0.60
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: WP OFFSITE MP = 33.49 Total Volume: 3 l

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 259 Date: 7-28-98

Well Name: MW-11 Sampling Zone No.: SCREEN 2 Starting Time: 1239 Finishing Time: ~~1333 1344~~ 1350

Technicians M. Losi & D. Durkin

Water Level Inside MP Casing (Beginning of Session) 14.35 PSIA (End of Session) 14.06 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	✓	✓	✓	✓	✓	✓	14.35 ~~14.48~~	✓	1245	1249	✓	14.35	1	1st Run, initial parameters NTUs: 3.45
2	✓	✓	✓	✓	✓	✓	14.19	✓	1305	1308	✓	14.13	1	2nd Run, collect sample, VOCs, metals, Anions + Vo, Cr+6
3	✓	✓	✓	✓	✓	✓	14.37*	✓	1333	1336	✓	14.06	1	3rd Run, collect sample, Cr+6, ClO4 and final parameters. NTUs: 3.64
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: WL outside MP = 69.62
* Three sample bottles

Total Volume: 3 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 429 Date: 7-28-98

Well Name: MW-11 Sampling Zone No.: Screen 3 Starting Time: 1131 Finishing Time: ____

Technicians: M. Losi & D. Dickard

Water Level Inside MP Casing (Beginning of Session) 68.87 PSIA (End of Session) 67.83*

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	✓	✓	✓	✓	✓	✓	68.87	✓	1138	1141	✓	68.85	1	1st run, initial parameters, NTU= 2.63
2	✓	✓	✓	✓	✓	✓	68.84	✓	1200	1203	✓	68.88	1	2nd run, collect sample, VOCs, metals, Anions, 1/2 Cr+6
3	✓	✓	✓	✓	✓	✓	67.82*	✓	1222	1224	✓	67.83*	1	3rd run, collect sample, Cr+6, clay & final parameters NTU= 0.74
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: WP outside MP = 135.06

* Only two sample bottles ∴ Δ in water level pressure

Total Volume: 3 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: ~~456~~ 524 Date: 7-28-98

Well Name: MW-11 Sampling Zone No.: Screen 4 Starting Time: 1006 Finishing Time: 1120

Technicians M. Losi, D. Durkin

Water Level Inside MP Casing (Beginning of Session) 109.79 psia (End of Session) 109.79 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	✓	✓	✓	✓	✓	✓	109.79	✓	1012	1016	✓	109.86	1	1st Run, initial parameters
2	✓		✓	✓	✓	✓	109.79	✓	1046	1049	✓	109.81	1	2nd Run, Collect sample, VOCs, metals, Anions ½ Cr+6
3	✓	✓	✓	✓	✓	✓	109.74	✓	1113	1115	✓	109.79	1	3rd Run, collect sample, ~~Anions~~ (B) Cr+6, clay & final parameters [illegible] = 4.81
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: Water level outside MP = 171.48

Total Volume: 3 l

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JSL Location: MW-11 Depth: 639' Date: 7-28-98

Well Name: MW-11 Sampling Zone No.: SCREEN 5 Starting Time: 0830 Finishing Time: 1000

Technicians M. Losi & D. Dirkin

Water Level Inside MP Casing (Beginning of Session) 159.50 psia (End of Session) 159.48 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	✓	✓	✓	✓	✓	✓	159.50	✓	0835	0838	✓	159.50	1	1ST Run, initial parameters, NTUs = 1.79
2	✓	✓	✓	✓	✓	✓	159.51	✓	0903	0906	✓	159.50	1	2nd Run, Vocs (ms/ms), metals (ms/ms). ½ Addition
3	✓	✓	✓	✓	✓	✓	159.47	✓	0935	0938	✓	159.48	1	3rd Run, Anion, Hex Chrome, Alk, & Final parameters, NTUs = 1.72
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: Water Pressure Outside MP: 195.81

Total Volume: 3 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 140 Date: 8/3/95

Well Name: MW-12 Sampling Zone No.: 1 Starting Time: 1315 Finishing Time: 1435

Technicians T. Blaney, M. Losi

Water Level Inside MP Casing (Beginning of Session) 14.45 psia (Atmosphere) (End of Session) 14.14 psia (Atmosphere)

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	✓	✓	✓	✓	✓	✓	14.45	✓	1317	1323	✓	14.05	1	1ST Run; Initial Parameters NTU's = 86.0; Reducing Turbidity
2	✓	✓	✓	✓	✓	✓	14.15	✓	1331	1336	✓	14.11	1	2ND Run; NTU's = 75.0 Reducing Turbidity
3	✓	✓	✓	✓	✓	✓	14.13	✓	1422	1428	✓	14.14	1	3RD Run; NTU's = 48.0; Reducing Turbidity
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: 39.11 psia outside Casing

Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 140 Date: 8/4/98

Well Name: MW-12 Sampling Zone No.: 1 Starting Time: 1020 Finishing Time: 1115

Technicians T. BLANEY, M. LOSI

Water Level Inside MP Casing (Beginning of Session) 14.28 psia (ATMOSPHERIC) (End of Session) 14.09 (TS.A)

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	✓	✓	✓	✓	✓	✓	14.28	✓	1025	1029	✓	14.19	0.75	1ST RUN AFTER PURGING, INITIAL PARAMETERS NTU's = 4.99, READY TO SAMPLE
2	✓	✓	✓	✓	✓	✓	14.21	✓	1044	1049	✓	14.08	1	SAMPLE MW-983-055" VOA METALS, ANIONS, 1/2 CYCLE
3	✓	✓	✓	✓	✓	✓	14.30	✓	~~1055~~ 1100	1105	✓	14.07	0.75	SAMPLE MW-983-055" 1/2 CYCLE CIO4, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: 38.71 psia outside CASING

Total Volume: 2.5L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 243 Date: 8/3/98

Well Name: MW-12 Sampling Zone No.: 2 Starting Time: 1225 Finishing Time: 1310

Technicians T. Burney, M. Losi

Water Level Inside MP Casing (Beginning of Session) 14.18 psia (Atmospheric) (End of Session) 14.13 psia (Atmospheric)

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	✓	1230	1233	✓	14.18	1	1st Run; Initial Parameters NTU's = 3.70, Ready to Sample
2	✓	✓	✓	✓	✓	✓	14.21	✓	1244	1247	✓	14.19	1	Sample MW 983054 VOCs, metals, Anions Sample MW-983-053 VOCs metals
3	✓	✓	✓	✓	✓	✓	14.31	✓	1300	1303	✓	14.13	1	Sample MW-983-054 Cr⁺⁶, ClO₄ Sample MW-983-053 Cr⁺⁶, ClO₄ + Final Parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: 74.83 psia outside Casing

Tor

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 323 Date: 8/3/98

Well Name: MW-12 Sampling Zone No.: 3 Starting Time: 1134 Finishing Time: 1220

Technicians T. Blarly, M. Losi

Water Level Inside MP Casing (Beginning of Session) 48.29 psia (End of Session) 48.25 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	✓	✓	✓	✓	✓	✓	48.29	✓	1137	1140	✓	48.32	1	1st Run, Initial Parameters NTU's = 3.24; Ready to Sample
2	✓	✓	✓	✓	✓	✓	48.24	✓	1153	1155	✓	48.27	1	Sample MW-983-C52 VOAs metals, Anions 1/2 Cr+6
3	✓	✓	✓	✓	✓	✓	48.22	✓	1210	1213	✓	48.25	1	Sample MW-983-C52 1/2 Cr+6 ClO4 + Final Parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: 107.23 psia outside casing

Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 436 Date: 8/3/98

Well Name: MW-12 Sampling Zone No.: 4 Starting Time: 1035 Finishing Time: 1130

Technicians: T. Blaney, M. Losi

Water Level Inside MP Casing (Beginning of Session) 97.43 psia (End of Session) 96.52 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	✓	✓	✓	✓	✓	✓	97.43	✓	1040	1043	✓	97.47	1	1ST Run; INITIAL PARAMETERS NTU's = 5.70; Ready to Sample
2	✓	✓	✓	✓	✓	✓	97.43	✓	1100	1102	✓	97.47	1	Sample MW-983-051 VOAs metals Anions ½ Cr+6
3	✓	✓	✓	✓	✓	✓	96.47	✓	1120	1121	✓	96.52	0.5	Sample MW-983-071 ½ Cr+6 ClO_4 + FINAL Parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: 149.00 outside CASING

Total Volume: 2.5L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 548 Date: 8/3/98

Well Name: MW-12 Sampling Zone No.: 5 Starting Time: 0900 Finishing Time: 1029

Technicians T. Blaney, M. Losi

Water Level Inside MP Casing (Beginning of Session) 146.35 psia (End of Session) 146.23 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	✓	✓	✓	✓	✓	✓	146.35	✓	0910	0914	✓	146.35	1	1ST Run, INITIAL PARAMETERS WITHIN ±10%; Ready to Sample
2	✓	✓	✓	✓	✓	✓	146.29	✓	0935	0938	✓	146.32	1	Sample MW-483-050 VOAs, VOA MS/MSD metals Metals MS/MSD, 1/2 ANIONS
3	✓	✓	✓	✓	✓	✓	146.20	✓	1017	1019	✓	146.23	1	Sample MW-483-050 1/2 ANIONS, CN to ClO_4 + Final Parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 30L

F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 207 Date: 7/24/96

Well Name: MW-14 Sampling Zone No.: 1 Starting Time: 1215 Finishing Time: 1435

Technicians J. BRENNER, T. BLANEY

Water Level Inside MP Casing (Beginning of Session) 14.24 (PSIA) (End of Session) 14.25 (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	✓	✓	✓	✓	✓	~~14.29~~	14.24	✓	1216	1221	✓	14.29	1.0	1ST RUN, INITIAL PARAMETERS, NTU's = 18.6
2	✓	✓	✓	✓	✓	✓	14.30	✓	1234	1239	✓	14.19	1.0	2ND RUN, ATTEMPTING TO REDUCE TURBIDITY, NTU's 44.
3	✓	✓	✓	✓	✓	✓	14.31	✓	1253	1258	✓	14.17	1.0	3RD RUN, TRYING TO REDUCE TURBIDITY, NTU's = 21.5
4	✓	✓	✓	✓	✓	✓	14.30	✓	1310	1315	✓	14.20	1.0	4TH RUN, STILL ATTEMPTING TO REDUCE TURBIDITY, NTU's = 18.5
5	✓	✓	✓	✓	✓	✓	14.35	✓	1409	1414	✓	14.23	1.0	5TH RUN - (AFTER PURGING) NTU's = 3.89; COLLECT MW-103 MS/MSD, METALS, ANIONS / 6TH RUN, Cr6+, ClO_4^-, FINAL PARAMETERS
6	✓	✓	✓	✓	✓	✓	14.34	✓	1426	1431	✓	14.25	1.0	
7														
8														
9														
10														
11														
12														

Comments: PRESS OUTSIDE MP CASING = 33.20 (PSIA)

Total Volume: 6.0 L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 277 Date: 7/24/98

Well Name: MW-14 Sampling Zone No.: 2 Starting Time: 1120 Finishing Time: 1210

Technicians J. BRENNER, T. BLANEY

Water Level Inside MP Casing (Beginning of Session) 29.77 (PSIA) (End of Session) 29.17 (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	✓	✓	✓	✓	✓	✓	29.77	✓	1125	1125	✓	29.76	1.0	1ST RUN; INITIAL PARAMETERS; NDS = 4.79
2	✓	✓	✓	✓	✓	✓	29.74	✓	1143	1146	✓	29.73	1.0	2ND RUN; COLLECT MW-983-046 ZVOAS, METALS, ANIONS, C-6+
3	✓	✓	✓	✓	✓	✓	29.19	✓	1200	1203	✓	29.17	0.75	3RD RUN; PERCHLORATE; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS OUTSIDE MP CASING = 63.03 (PSIA)

Total Volume: 2.75 L [F2]

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 382 Date: 7/24/98

Well Name: MW-14 Sampling Zone No.: 3 Starting Time: 1025 Finishing Time: 1115

Technicians: J. BRENNER, T. BLANEY

Water Level Inside MP Casing (Beginning of Session) 75.37 (PSIA) (End of Session) 74.37 (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	✓	✓	✓	✓	✓	✓	75.37	✓	1031	1033	✓	75.37	1.0	1ST RUN; INITIAL PARAMETERS; NTUS = 3.12
2	✓	✓	✓	✓	✓	✓	75.37	✓	1049	1052	✓	75.37	1.0	2ND RUN; COLLECT MW-983-015 2 VOAS, METALS, ANIONS, HEX. CR.
3	✓	✓	✓	✓	✓	✓	74.37	✓	1108	1110	✓	74.37	0.5	3RD RUN; PERCHLORATE; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 108.07 (PSIA)

Total Volume: 2.5 L [F2]

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 456 Date: 7/21/98

Well Name: MW-14 Sampling Zone No.: 4 Starting Time: 0925 Finishing Time: 1020

Technicians J. BIZENNER, T. BLANEY

Water Level Inside MP Casing (Beginning of Session) 107.58 (PS.A) (End of Session) 106.58 (PS.A)

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	✓	✓	✓	✓	✓	✓	107.58	✓	0933	0935	✓	107.60	1.0	1ST RUN; INITIAL PARAMETERS; NTUS = 1.03
2	✓	✓	✓	✓	✓	✓	107.57	✓	0951	0953	✓	107.58	1.0	2ND RUN; COLLECT MW-98S-044; 2VOAS, METALS, ANIONS, C-6
3	✓	✓	✓	✓	✓	✓	106.60	✓	1011	1013	✓	106.58	0.5	3RD RUN; PERCHLORATE; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 140.05 (PSIA)

Total Volume: 2.5 L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 540 Date: 7/24/98

Well Name: MW-14 Sampling Zone No.: 5 Starting Time: 0815 Finishing Time: 0920

Technicians J. BRANNER, T. BIANEY

Water Level Inside MP Casing (Beginning of Session) 144.06 (PSIA) (End of Session) 144.19 (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	✓	✓	✓	✓	✓	✓	144.16	✓	0824	0926	✓	144.19	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 2.40
2	✓	✓	✓	✓	✓	✓	144.18	✓	0847	0949	✓	144.19	1.0	2ND RUN; COLLECT MW-983-043 6 VOAS METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	144.20	✓	0910	0912	✓	144.19	1.0	3RD RUN; HOR. G., PERISTALTIC PUMP; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 175.81 (PSIA)

Total Volume: 3.0L

F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JDL Location: MW-17 Depth: 250 Date: 7/20/98

Well Name: MW-17 Sampling Zone No.: 1 Starting Time: 1315 Finishing Time: 1410

Technicians T. Bunney, J. Brenner

Water Level Inside MP Casing (Beginning of Session) 14.23 (FS.A) (End of Session) 14.22 (FS.A)

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	✓	✓	✓	✓	✓	✓	14.23	✓	1320	1324	✓	14.22	1.0	1ST RUN, INITIAL PARAMETERS; NO'S = 1.48
2	✓	✓	✓	✓	✓	✓	14.25	✓	1336	1337	✓	14.23	1.0	2ND RUN, COLLECT MW-783-040 ZVOA'S, METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	14.21	✓	1355	1400	✓	14.22	0.75	3RD RUN, HEX. CR, POLLUWATER FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 46.07

Total Volume: 2.75 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 370 Date: 7/20/98

Well Name: MW-17 Sampling Zone No.: 2 Starting Time: 1220 Finishing Time: 1310

Technicians J. Brenner, T. Blayney

Water Level Inside MP Casing (Beginning of Session) 19.06 (PSIA) (End of Session) 18.60 (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	✓	✓	✓	✓	✓	✓	19.06	✓	1222	1225	✓	19.04	1.0	1ST RUN, INITIAL PARAMETERS; NTU'S = 1.01
2	✓	✓	✓	✓	✓	✓	19.01	✓	1241	1243	✓	19.06	1.0	2ND RUN, COLLECT MW-183-039, 2 VOAS, METALS, ANIONS, Cr6+
3	✓	✓	✓	✓	✓	✓	18.63	✓	1258	1301	✓	18.60	0.75	3RD RUN, PERCHLORATE, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 87.90 (PSIA)

Total Volume: 2.75 L F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 468 Date: 7/29/98

Well Name: MW-17 Sampling Zone No.: 3 Starting Time: 0855 Finishing Time: 1040

Technicians M. Losi, T. Blaney

Water Level Inside MP Casing (Beginning of Session) 61.47 psia (End of Session) 61.46 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	✓	✓	✓	✓	✓	✓	61.47	✓	0903	0906	✓	61.49	1	1st 12mm, Final Parameters WTHS = 3.95; Ready to Sample
2	✓	✓	✓	✓	✓	✓	61.46	✓	0925	0928	✓	61.50	1	Sample MW-983-038 VOAs ½ 1,4-Dioxane
3	✓	✓	✓	✓	✓	✓	61.46	✓	0945	0948	✓	61.49	1	Sample MW-983-038 ½ 1,4 Dioxane ½ NDMA
4	✓	✓	✓	✓	✓	✓	61.48	✓	1006	1009	✓	61.48	1	Sample MW-983-038 ½ NDMA metals + ½ ANIONS
5	✓	✓	✓	✓	✓	✓	61.42	✓	1026	1029	✓	61.46	1	Sample MW-983-038 ½ ANIONS Cr+6, ClO4 + Final Parameters
6														
7														
8														
9														
10														
11														
12														

Comments: 122.39 psia outside CASING

Total Volume: 5.0L F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 582 Date: 7/20/98

Well Name: MW-17 Sampling Zone No.: 4 Starting Time: 1105 Finishing Time: 1215

Technicians T. Blaney, J. Brenner

Water Level Inside MP Casing (Beginning of Session) 111.16 (PSIA) (End of Session) 110.72 (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	✓	✓	✓	✓	✓	✓	111.16	✓	1112	1115	✓	111.19	1.0	1ST RUN; INITIAL PARAMETERS; NTUS: 9.37
2	✓	✓	✓	✓	✓	✓	111.19	✓	1131	1134	✓	111.18	1.0	2ND RUN; COLLECT MW-983-037; ZVOAS, METALS, ANIONS, HEX.C.
3	✓	✓	✓	✓	✓	✓	110.67	✓	1155	1157	✓	110.72	0.75	3RD RUN; PERCHLORATE; FINAL PARAMETERS
4														
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Comments: PRES. OUTSIDE MP. CASING = 148.04 (PSIA)

Total Volume: 2.75 L F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 726 Date: 7/20/98

Well Name: MW-17 Sampling Zone No.: 5 Starting Time: 0826 Finishing Time: 1100

Technicians: T. BLANEY, J. BRENNER

Water Level Inside MP Casing (Beginning of Session) 173.96 (PSIA) (End of Session) 173.96 (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	✓	✓	✓	✓	✓	✓	173.96	✓	0839	0841	✓	173.96	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 12.5
2	✓	✓	✓	✓	✓	✓	173.93	✓	0906	0908	✓	173.93	1.0	2ND RUN; ATTEMPTING TO REDUCE TURBIDITY; NTU'S = 20.1
3	✓	✓	✓	✓	✓	✓	173.93	✓	0935	0937	✓	173.95	1.0	3RD RUN; ATTEMPTING TO REDUCE TURBIDITY; NTU'S = 21.8
4	✓	✓	✓	✓	✓	✓	173.95	✓	1003	1005	✓	173.95	1.0	4TH RUN; NTU'S = 4.78; COLLECT MW-983-036; 2 VOAS, METALS, ANIONS
5	✓	✓	✓	✓	✓	✓	173.93	✓	1038	1040	✓	173.96	1.0	5TH RUN; HEX. Cr, PERCHLORATE; FINAL PARAMETERS
6														
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10														
11														
12														

F-2

Comments: PRESS. OUTSIDE MP CASING = 205.98 PSIA

Total Volume: 5.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-18 Depth: 270 Date: 7/17/98

Well Name: MW-18 Sampling Zone No.: 1 Starting Time: 1355 Finishing Time: 1450

Technicians J. Beenne, T. Blaney

Water Level Inside MP Casing (Beginning of Session) 14.20 psia (Atmosphere) (End of Session) 14.17 psia (Atmosphere)

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	✓	✓	✓	✓	✓	✓	14.20	✓	1400	1405	✓	14.19	1	1ST Run, INITIAL PARAMETERS NTU's = 3.8C.
2	✓	✓	✓	✓	✓	✓	14.19	✓	1418	1423	✓	14.19	1	Sample MW-18B-035 VOCs, metals, Anions. 1/2 cycle
3	✓	✓	✓	✓	✓	✓	14.17	✓	1440	1445	✓	14.17	1	Sample MW-18B-035 1/2 cycle Clay + Final Parameters
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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-18 Depth: 330 Date: 7/17/98

Well Name: MW-18 Sampling Zone No.: 2 Starting Time: 1305 Finishing Time: 1350

Technicians J. Brenner, T. Slaney

Water Level Inside MP Casing (Beginning of Session) 14.24 psia (ATMospheric) (End of Session) 14.21 psia (ATMospheric)

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	✓	1308	1311	✓	14.24	1	1st Run; Initial Parameters; NTU's = 3.14; Ready to Sample
2	✓	✓	✓	✓	✓	✓	14.23	✓	1325	1328	✓	14.23	1	Sample MW-18 S-034 VOA, metals, ANIONS 1/2 Cr+6
3	✓	✓	✓	✓	✓	✓	14.21	✓	1343	1346	✓	14.21	0.75	Sample MW-983-034 1/2 Cr+6 ClO4 + Final Parameters
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Comments:

Total Volume: 2.75L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-18 Depth: 424 Date: 7/17/98

Well Name: MW-18 Sampling Zone No.: 3 Starting Time: 1205 Finishing Time: 1300

Technicians J. Brenner, T. Blaney

Water Level Inside MP Casing (Beginning of Session) 37.79 psia (End of Session) 37.75 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	✓	✓	✓	✓	✓	✓	37.79	✓	1210	1213	✓	37.80	1	1st Run; Initial Parameters NTU's = 2.27; Ready to Sample
2	✓	✓	✓	✓	✓	✓	37.76	✓	1230	1232	✓	37.79	1	Sample MW-98-033; VOCs, metals Anions; ½ CrVI
3	✓	✓	✓	✓	✓	✓	37.74	✓	1249	1252	✓	37.75	1	Sample MW-98-033 ½ CrVI ClO_4 & Field Parameters
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Comments:

Total Volume: 3.0L F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-18 Depth: 564 Date: 7/17/98

Well Name: MW-18 Sampling Zone No.: 4 Starting Time: 1050 Finishing Time: 1155

Technicians J. BRENNER, T. BLANEY

Water Level Inside MP Casing (Beginning of Session) 98.62 psia (End of Session) 97.64 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	✓	✓	✓	✓	✓	✓	98.62	✓	1102	1104	✓	98.64	1	1ST Run; INITIAL PARAMETERS NTUs = 2.47, Ready to Sample
2	✓	✓	✓	✓	✓	✓	98.59	✓	1124	1126	✓	98.60	1	Sample MW-983-052 VOAs, metals, ANIONS, 1/2 Cr+6
3	✓	✓	✓	✓	✓	✓	97.64	✓	1150	1152	✓	97.64	0.5	Sample MW-983-052 1/2 Cr+6, ClO_4 + Final Parameters
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10														
11														
12														

Comments:

Total Volume: 2.5L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-18 Depth: 684 Date: 7/17/98

Well Name: MW-18 Sampling Zone No.: 5 Starting Time: 0905 Finishing Time: 1040

Technicians J. BRENNER, T. BLANEY

Water Level Inside MP Casing (Beginning of Session) 150.71 psia (End of Session) 150.74

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	✓	✓	✓	✓	✓	✓	150.71 psia	✓	0936	0938	✓	150.75	1	1ST RUN: INITIAL PARAMETERS NTU's = 1.02; READY TO SAMPLE
2	✓	✓	✓	✓	✓	✓	150.73	✓	1002	1004	✓	150.77	1	SAMPLE MW-98J-031, ⊕ MS/MSD FOR VOA's + METALS, 1/4 ANIONS
3	✓	✓	✓	✓	✓	✓	150.73	✓	1029	1031	✓	150.74	1	SAMPLE MW-98J-031 - 3/4 ANIONS Cr^{+6}, ClO_4 + FIELD PARAMETERS
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F-2

Comments: Total Volume: 3.0L

Page 1 of 1

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-19 Depth: 242 Date: 7/21/98

Well Name: MW-19 Sampling Zone No.: 1 Starting Time: 1210 Finishing Time: 1300

Technicians: T. Blaney, J Brennan

Water Level Inside MP Casing (Beginning of Session) 14.31 psia (Atmospheric) (End of Session) 14.20 psia (Atmospheric)

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	✓	✓	✓	✓	✓	✓	14.31	✓	1215	1219	✓	14.24	1	1st Run, Initial Parameters NTU's = 4.91; Ready to Sample
2	✓	✓	✓	✓	✓	✓	14.31	✓	1232	1235	✓	14.21	1	Sample MW-983-030 VOA metal Anions 1/2 Cr+6
3	✓	✓	✓	✓	✓	✓	14.31	✓	1248	1251	✓	14.20	0.75	Sample MW-983-030 1/2 Cr+6 ClO4 + Final Parameters
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Comments:

Total Volume: 2.75 L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-19 Depth: 314 Date: 7/21/98

Well Name: MW-19 Sampling Zone No.: 2 Starting Time: 1121 Finishing Time: 1205

Technicians T. Burney, S. Brenna

Water Level Inside MP Casing (Beginning of Session) 14.33 psia (Atmospheric) (End of Session) 14.28 psia (Atmospheric)

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	✓	✓	✓	✓	✓	✓	14.33	✓	1126	1129	✓	14.34	1	1st Purge, Initial Parameters NTUs = 4.07; Ready to Sample
2	✓	✓	✓	✓	✓	✓	14.29	✓	1143	1146	✓	14.27	1	Sample MW-983-029 VOAs metals, Anions, 1/2 Cr+6
3	✓	✓	✓	✓	✓	✓	14.24	✓	1159	1202	✓	14.28	0.75	Sample MW-983-039 1/2 Cr+6 ClO4 + Final Parameters
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12														

Comments:

Total Volume: 2.75L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-19 Depth: 392 Date: 7/21/98

Well Name: MW-19 Sampling Zone No.: 3 Starting Time: 1020 Finishing Time: 1116

Technicians T. Blakley, J. Brenner

Water Level Inside MP Casing (Beginning of Session) 37.03 psia (End of Session) 36.95 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	✓	✓	✓	✓	✓	✓	37.03	✓	1027	1030	✓	37.03	1	1st Run Initiate Parameters NTU's = 3.77, Ready to Sample
2	✓	✓	✓	✓	✓	✓	37.00	✓	1049	1051	✓	37.02	1	Sample MW-983-02E VOA's, Metals, Anions, 1/2 Cr+6
3	✓	✓	✓	✓	✓	✓	36.91	✓	1108	1100	✓	36.95	~~0.75~~ 1	Sample MW-983-03E 1/2 Cr+6 ClO4 + Final Parameters
4														
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10														
11														
12														

Comments:

Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-19 Depth: 444 Date: 7/21/98

Well Name: MW-19 Sampling Zone No.: 4 Starting Time: 0916 Finishing Time: 1015

Technicians: T. Blaney, S. Brenner

Water Level Inside MP Casing (Beginning of Session) 59.68 psia (End of Session) 59.15 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	✓	✓	✓	✓	✓	✓	59.68	✓	0924	0927	✓	59.71	1	1st Run; Initial Parameters NTU's = 4.55; Ready to Sample
2	✓	✓	✓	✓	✓	✓	59.62	✓	0946	0949	✓	59.63	1	Sample MW-983-027 VOA, metals Anions ½ cpte
3	✓	✓	✓	✓	✓	✓	59.12	✓	1007	1009	✓	59.15	0.75	Sample MW-983-027 ½ cpte ClO4 + Gnrl Parameters
4														
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9														
10														
11														
12														

Comments:

Total Volume: 2.75L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: IPL Location: MW-19 Depth: 498 Date: 7/21/98

Well Name: MW-19 Sampling Zone No.: 5 Starting Time: 0808 Finishing Time: 0910

Technicians T. Blaney, J Brenner

Water Level Inside MP Casing (Beginning of Session) 83.02 psia (End of Session) 83.12 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	✓	✓	✓	✓	✓	✓	83.02	✓	0815	0818	✓	83.04	1	1st Purge, Initial Parameters NTU's = 478. Ready to Sample
2	✓	✓	✓	✓	✓	✓	83.12	✓	0838	0840	✓	83.14	1	Sample MW-983-220 VOAs, metals VOAs MS/MSD; metals MS/MSD; 1/2 AM Lab
3	✓	✓	✓	✓	✓	✓	83.10	✓	0900	0903	✓	83.12	1	Sample MW-983-220 1/2 AM Lab Cr+6, Cl2, & Final Parameters
4														
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6														
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9														
10														
11														
12														

Comments:

Total Volume: 30L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-20 Depth: 230 Date: 7/22/98

Well Name: MW-20 Sampling Zone No.: 1 Starting Time: 1315 Finishing Time: 1400

Technicians J. BRENNER, T. BLANEY

Water Level Inside MP Casing (Beginning of Session) 14.30 (PSIA) (End of Session) 14.36 (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	✓	✓	✓	✓	✓	✓	14.30	✓	1318	1323	✓	14.38	1.0	1ST RUN, INITIAL PARAMETERS; NTUS = 3.23
2	✓	✓	✓	✓	✓	✓	14.31	✓	1335	1340	✓	14.33	1.0	2ND RUN, COLLECT MW-98-025 2VOAS METALS ANIONS
3	✓	✓	✓	✓	✓	✓	14.37	✓	1351	1356	✓	14.36	1.0	3RD RUN, G-6T RECALCULATE; FINAL PARAMETERS
4														
5														
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12														

Comments: PRESS. OUTSIDE MP CASING = 29.53 (PSIA)

Total Volume: 3.0 L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-20 Depth: 392 Date: 7/22/98

Well Name: MW.20 Sampling Zone No.: 2 Starting Time: 1220 Finishing Time: 1310

Technicians J. BRENNER, T. BLANEY

Water Level Inside MP Casing (Beginning of Session) 46.74 (PSIA) (End of Session) 45.71 (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	✓	✓	✓	✓	✓	✓	46.74	✓	1227	1229	✓	46.70	1.0	1ST RUN, INITIAL PARAMETERS; NTU'S = 1.32; Ready to Sample
2	✓	✓	✓	✓	✓	✓	46.74	✓	1244	1246	✓	46.75	1.0	Sample MW-983-024 VOAs metals ANIONS 1/2 Cr+6
3	✓	✓	✓	✓	✓	✓	45.69	✓	1302	1303	✓	45.71	0.5	Sample MW-983-024 1/2 Cr+6 ClO4 + Final Parameters
4														
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7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 99.52 (PSIA)

Total Volume: 2.5L F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-20 Depth: 562 Date: 7/22/98

Well Name: MW-20 Sampling Zone No.: 3 Starting Time: 1115 Finishing Time: 1215

Technicians J. BRENNER, T. BLANEY

Water Level Inside MP Casing (Beginning of Session) 120.62 (PSIA) (End of Session) 119.62 (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	✓	✓	✓	✓	✓	✓	120.62	✓	1123	1125	✓	120.64	1.0	1ST RUN; INITIALS PARAMETERS; NTUS = 0.68
2	✓	✓	✓	✓	✓	✓	120.64	✓	1145	1147	✓	120.63	1.0	2ND RUN; COLLECT MW-9813-023 2VOAS METALS, ANIONS, G-GR
3	✓	✓	✓	✓	✓	✓	119.51	✓	1207	1208	✓	119.62	0.5	3RD RUN; TURBIDITY, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 161.97 (PSIA)

Total Volume: 2.5L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-20 Depth: 700 Date: 7/22/98

Well Name: MW-20 Sampling Zone No.: 4 Starting Time: 1000 Finishing Time: 1110

Technicians J. BRENNER, T. BLANEY

Water Level Inside MP Casing (Beginning of Session) 180.73 (PSIA) (End of Session) 179.68 (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	✓	✓	✓	✓	✓	✓	180.73	✓	1009	1011	✓	180.71	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 2.14
2	✓	✓	✓	✓	✓	✓	180.70	✓	1034	1036	✓	180.71	1.0	2ND RUN; COLLECT MW-20S-022; VOC'S, METALS, ANIONS, C-4
3	✓	✓	✓	✓	✓	✓	179.67	✓	1100	1101	✓	179.68	0.5	3RD RUN; PERCHLORATE; FINAL PARAMETERS
4														
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Comments: PRESS. ~~INSIDE~~ OUTSIDE MP CASING = 219.28 (PSIA) Total Volume: 2.5L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-20 Depth: 900 Date: 7/22/98

Well Name: MW-20 Sampling Zone No.: 5 Starting Time: 0810 Finishing Time: 0955

Technicians J. BRENNER, T. BLANEY

Water Level Inside MP Casing (Beginning of Session) 267.70 (PS.A) (End of Session) 266.59 (PS.A)

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	✓	✓	✓	✓	✓	✓	267.70	✓	0820	0822	✓	267.71	1.0	1ST RUN; INITIAL PARAMETERS, NTU'S = 3.3
2	✓	✓	✓	✓	✓	✓	267.67	✓	0853	0855	✓	267.70	1.0	2ND RUN; COLLECT MW-383-021, 2 VOA'S, METALS, ANIONS, C
3	✓	✓	✓	✓	✓	✓	266.62	✓	0940	0941	✓	266.59	0.5	3RD RUN; TURBIDITY, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTS. OF MP CASING = 321.38 PSIA

Total Volume: 2.5L [2]

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-21 Depth: 90 Date: 1/23/98

Well Name: MW-21 Sampling Zone No.: 1 Starting Time: 1233 Finishing Time: 1310

Technicians T. DLANEY, J. Brenner

Water Level Inside MP Casing (Beginning of Session) 14.30 psia (ATMOSPHERIC) (End of Session) 14.16 psia (ATMOSPHERIC)

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	✓	✓	✓	✓	✓	✓	14.30	✓	1235	1241	✓	14.16	1	1ST Purge; Initial Parameters; NTUs = 3.37; Ready to Sample
2	✓	✓	✓	✓	✓	✓	14.24	✓	1249	1254	✓	14.18	1	Sample MW-983-020 VOAs metals ANIONS 1/2 CrVI
3	✓	✓	✓	✓	✓	✓	14.26	✓	1302	1307	✓	14.16	1	Sample MW-983-010 1/2 CrVI ClO4 + Final Parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: 32.16 psia outside port

Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-21 Depth: 161 Date: 7/23/98

Well Name: MW-21 Sampling Zone No.: 2 Starting Time: 1152 Finishing Time: 1228

Technicians T. Bradley, J. Brenner

Water Level Inside MP Casing (Beginning of Session) 42.39 psia (End of Session) 41.88 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	✓	✓	✓	✓	✓	✓	42.39	✓	1154	1158	✓	42.39	1	1st Run; Initial Parameters; NTUs = 3.85; Ready to Sample
2	✓	✓	✓	✓	✓	✓	42.36	✓	1208	1211	✓	42.37	1	Sample MW-983-019 VOAs metals Anions 1/2 Cr++
3	✓	✓	✓	✓	✓	✓	41.87	✓	1223	1226	✓	41.88	0.75	Sample MW-987-019 1/2 Cr++ ClO_4 + Final Parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: 62.38 psia outside port

Total Volume: 2.75L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-21 Depth: 240 Date: 7/23/98

Well Name: MW-21 Sampling Zone No.: 3 Starting Time: 1104 Finishing Time: 1148

Technicians T. BLANEY, J. Brenna

Water Level Inside MP Casing (Beginning of Session) 76.76 psia (End of Session) 76.78 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	✓	✓	✓	✓	✓	✓	76.76	✓	1102	1110	✓	76.78	1	1ST Run; INITIAL PARAMETERS NTU's = 4.83; Ready to Sample
2	✓	✓	✓	✓	✓	✓	76.76	✓	1122	1124	✓	76.78	1	Sample MW-983-018 VOCs metals ANIONS 1/2 CYTC
3	✓	✓	✓	✓	✓	✓	76.78	✓	1138	1141	✓	76.78	1	Sample MW-985-018; 1/2 CYTC ClO_4 + Final Parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: 96.00 psia outside port

Total Volume: 3.0L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-21 Depth: 310 Date: 7/23/98

Well Name: MW-21 Sampling Zone No.: 4 Starting Time: 1015 Finishing Time: 1100

Technicians T. Bradley, J. Brenner

Water Level Inside MP Casing (Beginning of Session) 106.82 psia (End of Session) 105.77 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	✓	✓	✓	✓	✓	✓	106.82	✓	1021	1023	✓	106.84	1	1st Run; Initial Parameters NTU's = 2.42. Ready to Sample
2	✓	✓	✓	✓	✓	✓	106.79	✓	1037	1039	✓	106.87	1	Sample MW-983-017 VOA's metals Anions 1/2 CrVI
3	✓	✓	✓	✓	✓	✓	105.75	✓	1053	1054	✓	105.77	0.5	Sample MW-983-017 1/2 CrVI ClO4 + Final Parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: 125.58 psia outside port

Total Volume: 2.5L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling

Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-21 Depth: 372 Date: 7/23/98

Well Name: MW-21 Sampling Zone No.: 5 Starting Time: 0817 Finishing Time: 1010

Technicians T. Blaney, J. Brenner

Water Level Inside MP Casing (Beginning of Session) 133.96 psia (End of Session) 133.89 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	✓	✓	✓	✓	✓	✓	133.96	✓	0825	0827	✓	133.97	1	1ST Run; INITIAL PARAMETERS NTU's = 11.2; Reducing TURBIDITY
2	✓	✓	✓	✓	✓	✓	133.91	✓	0845	0847	✓	133.92	1	2ND Run; NTU's = 19.4; Reducing TURBIDITY
3	✓	✓	✓	✓	✓	✓	133.94	✓	0904	0907	✓	133.94	1	3RD Run; NTU's = 26.6; Reducing TURBIDITY
4	✓	✓	✓	✓	✓	✓	133.91	✓	0922	0925	✓	133.91	1	4th Run; NTU's = 4.2; Ready to Sample
5	✓	✓	✓	✓	✓	✓	133.88	✓	0941	0944	✓	133.89	1	Sample MW-983-016 VOAS, VOAS MS/MSD metals, metals MS/MSD
6	✓	✓	✓	✓	✓	✓	133.89	✓	1002	1004	✓	133.89	1	Sample MW-983-016 ANIONS Cr+6, ClO4 + Final Parameters
7														
8														
9														
10														
11														
12														

Comments: 152.47 psia outside CASING

Total Volume: 6.0L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-22 Depth: 245 Date: 8/11/98

Well Name: MW-22 Sampling Zone No.: 1 Starting Time: 1225 Finishing Time: 1325

Technicians: T. Brawley, D. Dirkin

Water Level Inside MP Casing (Beginning of Session): 18.65 psia (End of Session): 17.52 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	✓	✓	✓	✓	✓	✓	18.65	✓	1228	1232	✓	18.55	1	1st Run; Initial Parameters NTU's = 4.84 Ready to Sample
2	✓	✓	✓	✓	✓	✓	18.65	✓	1247	1251	✓	18.64	1	Sample MW-983-015 VOAs metals, Anions, ½ Cr+6
3	✓	✓	✓	✓	✓	✓	18.52	✓	1304	1306	✓	18.52	0.25	Sample MW-983-015 ½ Cr+6 ClO4 ~~Final Parameters~~
4	✓	✓	✓	✓	✓	✓	17.52	✓	1318	1320	✓	17.52	0.5	Final Parameters
5														
6														
7														
8														
9														
10														
11														
12														

Comments: 46.95 psia outside casing
Odor of Paint in the air while Sampling MW-983-015

Total Volume: 2.75L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-22 Depth: 329 Date: 8/10/98

Well Name: MW-22 Sampling Zone No.: 2 Starting Time: 1140 Finishing Time: 1153

Technicians T. BLANEY, D. DIRKIN

Water Level Inside MP Casing (Beginning of Session) 55.49 psia (End of Session) 55.50 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	✓	✓	✓	✓	✓	✓	55.49	✓	1145	1148	✓	55.50	1	1ST Run; INITIAL PARAMETERS NTU's = 3.33; Ready to Sample
2														* WESTBAY SAMPLE TOOL
3														MALFUNCTION — WILL
4														RETURN LATER
5														
6														
7														
8														
9														
10														
11														
12														

Comments: 80.58 psia outside CASING

Total Volume: 1.0L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-22 Depth: 329 Date: 8/11/98

Well Name: MW-22 Sampling Zone No.: 2 Starting Time: 0950 Finishing Time: 1045

Technicians T. BLANEY, D. PIRKLE

Water Level Inside MP Casing (Beginning of Session) 55.47 psia (End of Session) 55.43 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	✓	✓	✓	✓	✓	✓	55.47	✓	0956	0959	✓	55.48	1	1ST Run; INITIAL Parameters NTUs = 4.44. Ready to Sample
2	✓	✓	✓	✓	✓	✓	55.41	✓	1013	1016	✓	55.43	1	Sample MW-983-014 VOA metals TAL ONLY 1/2 Cr+6
3	✓	✓	✓	✓	✓	✓	55.41	✓	1034	1037	✓	55.43	1	Sample MW-983-014 1/2 Cr+6 ClO4 + Final Parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: 80.39 psia outside CASING

Total Volume: 3.0L