REPORT

QUARTERLY GROUNDWATER MONITORING RESULTS, OCTOBER-NOVEMBER 1998

AT THE

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EXECUTIVE SUMMARY

Presented in this report are the results of the nineth quarterly groundwater sampling event (October-November 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 October 22 to November 19, 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 indicate that only four VOCs (carbon tetrachloride, trichloroethene, tetrachloroethene and 1,2-dichloroethane) were detected at concentrations above state or Federal Maximum Contaminant Levels (MCLs) for drinking water. Perchlorate was detected 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 in any wells, and total chromium was infrequently detected at levels well below its MCL. Lead was also only detected in one well at a concentration below its action level. 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 nineth 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 October 22 to November 19, 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 (October 19-20, 1998), and after (November 20, 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 (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 to the laboratory. 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 October 22 to November 19, 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 October-November 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 October-November 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 nine 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 , MW-23(Screen 1), 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 well MW-21 (Screen 5).

3.2 PERCHLORATE RESULTS

Perchlorate analyses were conducted on groundwater samples from the October-November 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 14 wells (Table 3-3). Concentrations in nine of the 14 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 not detected in JPL groundwater samples during the October-November 1998 event. Total Pb was detected at a level well below the state and Federal Action Level (0.015 mg/L) in one well, MW-11 (Screen 3). Total Cr was detected in five wells [MW-4 (Screen 2), MW-6, MW-13, MW-16 and MW-23 (Screen 1)] at concentrations below state and Federal

drinking water standards (0.05 and 0.10 mg/L, respectively). 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 nine 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 October-November 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 was detected once, in MW-16 (3.7µg/L), and NDMA was 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 October-November 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 eighteen trip blanks were submitted for analysis during the October-November 1998 sampling event. No compounds were detected in any of the trip blanks. Low levels (<5.7µg/L) of dichloromethane were detected in six equipment blanks. Dichloromethane is a common laboratory contaminant and has been detected in various QA/QC blanks in past

sampling events. Dichloromethane was not detected in associated groundwater samples, and therefore cross contamination of samples is not indicated.

Very low levels (<1.3µg/L) of chloroform were detected in six equipment blanks, chloroform was also detected in associated water samples. This has occurred sporadically in past sampling events, and it is believed that very low levels of chloroform are present in the decontamination water.

Chlorofluoromethane was detected in one equipment blank sample. Chlorofluoromethane was not detected in associated groundwater samples, and is most likely attributable to the decontamination solution.

Carbon disulfide was detected in the field blank. Carbon disulfide has been identified in past events as a laboratory contaminant, and this most likely explains its presence in the field blank.

Overall, the field QA/QC data suggest that contamination of groundwater samples through field procedures is insignificant.

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 October-November 1998 event have been compiled as Stiff diagrams (Figures 4-1, 4-2 and 4-3). Review of the water chemistry data 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 some 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 October-November 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 water type, was prevalent in the shallower screens of the monitoring wells located upgradient and

to the south of the JPL facility. 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 October-November 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 October-November 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 October-November 1998 sampling event are within the ideal range ($\pm$5 percent) for 74 of the 75 set of water chemistry results. The charge balance for the remaining set of water chemistry analyses was slightly above 5 percent (Table 4-3), and none of the sets 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 October-November 1998 water-chemistry results fell within the ideal range (1.0 to 1.2) for 68 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 October 19-20, 1998, and after sampling, on November 20, 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. The "trough" of depression observed around the City of Pasadena municipal production wells (Figures 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

TABLE 1-1

SUMMARY OF WELL CONSTRUCTION DETAILS FOR JPL GROUNDWATER MONITORING WELLS

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

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SUMMARY OF WELL CONSTRUCTION DETAILS FOR JPL GROUNDWATER MONITORING WELLS

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

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 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-984-001	GW	X	X	X	X	X		
MW-3									
Screen 1	MW-984-002	GW	X	X	X	X	X		
Screen 2	MW-984-003	GW	X	X	X	X	X		
Screen 3	MW-984-004	GW	X	X	X	X	X		
Screen 4	MW-984-005	GW	X	X	X	X	X		
Screen 5	MW-984-006	GW	X	X	X	X	X		
MW-4									
Screen 1	MW-984-007	GW	X	X	X	X	X		
Screen 2	MW-984-008	GW	X	X	X	X	X	X	X
Screen 2	MW-984-009	DUP	X	X (no cations)	X		X		
Screen 3	MW-984-010	GW	X	X	X	X	X		
Screen 4	MW-984-011	GW	X	X	X	X	X		
Screen 5	MW-984-012	GW	X	X	X	X	X		
MW-5	MW-984-013	GW	X	X	X	X	X		
MW-6	MW-984-014	GW	X	X	X	X	X		
MW-7	MW-984-015	GW	X	X	X	X	X	X	X
MW-8	MW-984-016	GW	X	X	X	X	X		
MW-9	MW-984-017	GW	X	X	X	X	X		
MW-10	MW-984-018	GW	X	X	X	X	X		
MW-10	MW-984-019	DUP	X	X (no cations)	X		X		
MW-11									
Screen 1	MW-984-020	GW	X	X	X	X	X		
Screen 2	MW-984-021	GW	X	X	X	X	X		
Screen 3	MW-984-022	GW	X	X	X	X	X		
Screen 4	MW-984-023	GW	X	X	X	X	X		
Screen 5	MW-984-024	GW	X	X	X	X	X		

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 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-984-025	GW	X	X	X	X	X		
Screen 2	MW-984-026	GW	X	X	X	X	X		
Screen 2	MW-984-027	DUP	X	X (no cations)	X		X		
Screen 3	MW-984-028	GW	X	X	X	X	X		
Screen 4	MW-984-029	GW	X	X	X	X	X		
Screen 5	MW-984-030	GW	X	X	X	X	X		
MW-13	MW-984-031	GW	X	X	X	X	X	X	X
MW-13	MW-984-032	DUP	X	X (no cations)	X		X		
MW-14									
Screen 1	MW-984-033	GW	X	X	X	X	X		
Screen 2	MW-984-034	GW	X	X	X	X	X		
Screen 3	MW-984-035	GW	X	X	X	X	X		
Screen 4	MW-984-036	GW	X	X	X	X	X		
Screen 5	MW-984-037	GW	X	X	X	X	X		
MW-15	MW-984-038	GW	X	X	X	X	X		
MW-16	MW-984-039	GW	X	X	X	X	X	X	X
MW-17									
Screen 1	MW-984-040	GW	X	X	X	X	X		
Screen 2	MW-984-041	GW	X	X	X	X	X		
Screen 3	MW-984-042	GW	X	X	X	X	X	X	X
Screen 4	MW-984-043	GW	X	X	X	X	X		
Screen 5	MW-984-044	GW	X	X	X	X	X		
MW-18									
Screen 1	MW-984-045	GW	X	X	X	X	X		
Screen 2	MW-984-046	GW	X	X	X	X	X		
Screen 3	MW-984-047	GW	X	X	X	X	X		
Screen 4	MW-984-048	GW	X	X	X	X	X		
Screen 5	MW-984-049	GW	X	X	X	X	X		

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 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-984-050	GW	X	X	X	X	X		
Screen 2	MW-984-051	GW	X	X	X	X	X		
Screen 3	MW-984-052	GW	X	X	X	X	X		
Screen 4	MW-984-053	GW	X	X	X	X	X		
Screen 5	MW-984-054	GW	X	X	X	X	X		
MW-20									
Screen 1	MW-984-055	GW	X	X	X	X	X		
Screen 2	MW-984-056	GW	X	X	X	X	X		
Screen 3	MW-984-057	GW	X	X	X	X	X		
Screen 4	MW-984-058	GW	X	X	X	X	X		
Screen 5	MW-984-059	GW	X	X	X	X	X		
MW-21									
Screen 1	MW-984-060	GW	X	X	X	X	X		
Screen 2	MW-984-061	GW	X	X	X	X	X		
Screen 3	MW-984-062	GW	X	X	X	X	X		
Screen 4	MW-984-063	GW	X	X	X	X	X		
Screen 5	MW-984-064	GW	X	X	X	X	X		
MW-22									
Screen 1	MW-984-065	GW	X	X	X	X	X		
Screen 2	MW-984-066	GW	X	X	X	X	X		
Screen 3	MW-984-067	GW	X	X	X	X	X		
Screen 4	MW-984-068	GW	X	X	X	X	X		
Screen 5	MW-984-069	GW	X	X	X	X	X		
MW-23									
Screen 1	MW-984-070	GW	X	X	X	X	X		
Screen 2	MW-984-071	GW	X	X	X	X	X		
Screen 3	MW-984-072	GW	X	X	X	X	X		
Screen 4	MW-984-073	GW	X	X	X	X	X		
Screen 5	MW-984-074	GW	X	X	X	X	X		

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 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-984-075	GW	X	X	X	X	X	X	X
Screen 2	MW-984-076	GW	X	X	X	X	X		
Screen 3	MW-984-077	GW	X	X	X	X	X		
Screen 4	MW-984-078	GW	X	X	X	X	X		
Screen 5	MW-984-079	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, OCTOBER-NOVEMBER 1998

(concentrations in µg/L)
Values above state or Federal MCLs or action levels are 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-984-001	--	--	--	--	--	--	--	--	--	--
MW-3											
Screen 1	MW-984-002	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-984-003	--	--	--	--	--	--	--	--	--	--
Screen 3	MW-984-004	**5.8**	0.7	--	--	--	--	--	21	2.7 Carbon disulfide	--
Screen 4	MW-984-005	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-984-006	--	--	--	--	--	--	--	--	--	**91**
MW-4											
Screen 1	MW-984-007	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-984-008	**0.9**	2.4	0.7	--	--	--	--	1.6	--	**25**
Screen 2 (DUP)	MW-984-009	**1.2**	3.1	0.8	0.6	--	--	--	2.0	--	**25**
Screen 3	MW-984-010	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-984-011	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-984-012	--	--	--	--	--	--	--	--	--	--
MW-5	MW-984-013	--	--	--	--	--	--	--	--	--	--
MW-6	MW-984-014	--	--	0.7	--	--	--	--	--	--	--
MW-7	MW-984-015	**51**	**18**	0.9	--	**0.7**	1.1	3.0	9.8	3.4 Carbon disulfide	**210**
MW-8	MW-984-016	--	--	--	--	--	--	--	--	--	--
MW-9	MW-984-017	--	--	--	--	--	--	--	--	--	--
MW-10	MW-984-018	--	--	--	--	--	--	--	--	--	--
MW-10 (DUP)	MW-984-019	--	--	--	--	--	--	--	--	--	--

TABLE 3-3

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

(concentrations in µg/L)
Values above state or Federal MCLs or action levels are 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-984-020	**1.4**	--	--	--	--	--	--	--	--	--
Screen 2	MW-984-021	**0.6**	--	--	--	--	--	--	0.7	--	--
Screen 3	MW-984-022	**1.3**	--	--	--	--	--	--	1.1	--	--
Screen 4	MW-984-023	--	--	--	--	--	--	--	0.6	--	--
Screen 5	MW-984-024	--	--	--	--	--	--	--	--	--	--
MW-12											
Screen 1	MW-984-025	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-984-026	**1.3**	--	--	--	--	--	--	1.0	--	4.2
Screen 2 (*DUP*)	MW-984-027	**1.2**	--	--	--	--	--	--	0.9	--	4.6
Screen 3	MW-984-028	**27**	--	--	--	--	--	--	2.2	--	6.9
Screen 4	MW-984-029	**4.1**	--	--	--	--	--	--	1.2	--	7.7
Screen 5	MW-984-030	**2.0**	--	--	--	--	--	--	0.6	--	--
MW-13	MW-984-031	**9.0**	**20**	--	--	--	1.1	0.5	9.3	--	**86**
MW-13 (DUP)	MW-984-032	**9.0**	**19**	--	--	--	0.9	0.6	9.1	--	**85**
MW-14											
Screen 1	MW-984-033	--	--	0.5	2.4	--	--	--	0.6	--	4.2
Screen 2	MW-984-034	--	0.6	1.5	0.7	--	--	--	0.5	--	4.2
Screen 3	MW-984-035	--	--	--	--	--	--	--	--	--	6.7
Screen 4	MW-984-036	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-984-037	--	--	--	--	--	--	--	--	--	--
MW-15	MW-984-038	--	--	--	--	--	--	--	--	--	--
MW-16	MW-984-039	**51**	**18**	1.0	--	**1.5**	1.6	1.4	29	1.1 1,1,1-Trichloroethane 13 Carbon disulfide	**220**

TABLE 3-3

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

(concentrations in µg/L)
Values above state or Federal MCLs or action levels are 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-984-040	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-984-041	--	--	--	--	--	--	--	3.7	--	--
Screen 3	MW-984-042	--	1.9	--	--	--	--	--	4.1	--	5.1
Screen 4	MW-984-043	--	**6.2**	0.5	--	--	--	--	1.9	--	12
Screen 5	MW-984-044	--	**11**	0.8	--	--	--	--	2.7	--	12
MW-18											
Screen 1	MW-984-045	--	--	--	--	--	--	--	-	--	--
Screen 2	MW-984-046	--	--	--	--	--	--	--	--	--	--
Screen 3	MW-984-047	--	1.4	0.8	--	--	--	--	4.2	--	--
Screen 4	MW-984-048	**3.4**	0.8	1.5	--	--	--	--	0.7	--	**19**
Screen 5	MW-984-049	--	--	--	--	--	--	--	--	--	--
MW-19											
Screen 1	MW-984-050	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-984-051	--	--	--	--	--	--	--	--	--	--
Screen 3	MW-984-052	--	--	2.0	--	--	--	--	--	--	4.2
Screen 4	MW-984-053	--	--	--	--	--	--	--	2.2	--	--
Screen 5	MW-984-054	--	--	1.5	--	--	--	--	--	--	--
MW-20											
Screen 1	MW-984-055	--	--	--	--	--	--	--	0.8	--	7.8
Screen 2	MW-984-056	--	--	--	--	--	--	--	3.6	--	--
Screen 3	MW-984-057	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-984-058	--	--	--	--	--	--	--	--	--	**20**
Screen 5	MW-984-059	--	--	--	--	--	--	--	--	--	8.2

TABLE 3-3

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

(concentrations in µg/L)

Values above state or Federal MCLs or action levels are 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-984-060	--	**10**	--	--	--	--	--	1.6	--	13
Screen 2	MW-984-061	--	--	--	--	--	--	--	0.7	--	--
Screen 3	MW-984-062	--	--	0.8	--	--	--	--	--	--	--
Screen 4	MW-984-063	--	1.1	**8.3**	--	--	--	--	0.6	1.3 cis-1,2-Dichloroethene	--
Screen 5	MW-984-064	--	--	**6.7**	--	--	--	--	0.6	1.4 cis-1,2-Dichloroethene	4.0
MW-22											
Screen 1	MW-984-065	--	--	1.7	0.7	--	--	--	--	--	--
Screen 2	MW-984-066	--	--	--	--	--	--	--	--	--	--
Screen 3	MW-984-067	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-984-068	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-984-069	--	--	--	--	--	--	--	--	--	--
MW-23											
Screen 1	MW-984-070	**0.8**	**15**	--	--	--	--	--	1.9	--	**21**
Screen 2	MW-984-071	--	0.6	0.7	0.6	--	--	--	0.6	--	16
Screen 3	MW-984-072	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-984-073	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-984-074	--	--	--	--	--	--	--	--	3.1 2-Methyl-1-propene	17
MW-24											
Screen 1	MW-984-075	**1.0**	1.3	--	--	--	--	--	0.8	--	16
Screen 2	MW-984-076	**19**	2.3	0.8	--	--	0.8	--	5.9	--	**490**
Screen 3	MW-984-077	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-984-078	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-984-079	--	--	--	--	--	--	--	--	--	--

TABLE 3-3

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

(concentrations in µg/L)

Values above state or Federal MCLs or action levels are 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	70 cis-1,2-Dichloroethene[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 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	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 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	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 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	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 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
	Oct/Nov 1998	**5.8**	0.7	--	--	--	--	--	21	2.7 Carbon disulfide	--

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 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	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 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	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	91
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)	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
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
	Oct/Nov 1998	0.9	2.4	0.7	--	--	--	--	1.6	--	25

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 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]	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 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	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 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]	--
	Oct/Nov 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 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-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	--	--
	Jul/Aug 1998	--	0.6	2.5	0.8	--	--	--	--	7.6 Dichloromethane(b)	4.2
	Oct/Nov 1998	--	--	0.7	--	--	--	--	--	--	--
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**
	Oct/Nov 1998	**51**	**18**	0.9	--	**0.7**	1.1	3.0	9.8	3.4 Carbon disulfide	**210**
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)	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 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 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-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]	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
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**	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	**1.4**	--	--	--	--	--	--	--	--	--
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	--	--
	Oct/Nov 1998	**0.6**	--	--	--	--	--	--	0.7	--	--
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	--	--
	Oct/Nov 1998	**1.3**	--	--	--	--	--	--	1.1	--	--

TABLE 3-4

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(concentrations in µg/L)

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

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	0.5	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	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	0.6	--	--
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	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 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	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 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
	Oct/Nov 1998	1.3	--	--	--	--	--	--	1.0	--	4.2

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Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 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
	Oct/Nov 1998	**27**	--	--	--	--	--	--	2.2	--	6.9
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
	Oct/Nov 1998	**4.1**	--	--	--	--	--	--	1.2	--	7.7
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	--	--
	Oct/Nov 1998	**2.0**	--	--	--	--	--	--	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**
	Oct/Nov 1998	**9.01**	**20**	--	--	--	1.1	0.5	9.3	--	**86**

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Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
MW-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
	Oct/Nov 1998	--	--	0.5	2.4	--	--	--	0.6	--	4.2
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
	Oct/Nov 1998	--	0.6	1.5	0.7	--	--	--	0.5	--	4.2
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
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	6.7
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	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--

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Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.1(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.6(TB) Acetone	NA
										1.3 Carbon disulfide	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	4.6 Carbon disulfide(4)	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 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)	**420**
										1.0 1,1,1-Trichloroethane	
	Oct/Nov 1998	**51**	**18**	1.0	--	**1.5**	1.6	1.4	29	1.1 1,1,1-Trichloroethane	**220**
										13 Carbon disulfide	
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	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--

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Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 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	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	3.7	--	--
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	--	--
	Oct/Nov 1998	--	1.9	--	--	--	--	--	4.1	--	5.1
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
	Oct/Nov 1998	--	6.2	0.5	--	--	--	--	1.9	--	12
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
	Oct/Nov 1998	--	11	0.8	--	--	--	--	2.7	--	12

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(concentrations in µg/L)

Values above state and/or Federal MCLs or action levels are 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-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)	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
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	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
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
	Oct/Nov 1998	--	1.4	0.8	--	--	--	--	4.2	--	--
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
	Oct/Nov 1998	**3.4**	0.8	1.5	--	--	--	--	0.7	--	19

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 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	--	--	--	--	--	--	--	--	--	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	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 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	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
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
	Oct/Nov 1998	--	--	2.0	--	--	--	--	--	--	4.2

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 bold and shaded

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 4	Aug/Sep 1996	**0.5**	1.5	--	--	--	--	--	2.1	--	NA
	Oct/Nov 1996	--	1.5	--	--	--	--	--	1.9	--	NA
	Feb/Mar 1997	--	1.1	0.6	--	--	--	--	1.5	--	NA
	Jun/Jul 1997	--	0.7	--	--	--	--	--	1.3	--	--
	Sep/Oct 1997	--	0.7	0.6	--	--	--	--	1.7	--	4.9
	Jan/Feb 1998	--	0.5	0.6	--	--	--	--	1.3	--	--
	Apr/May 1998	--	0.8	1.0	--	--	--	--	1.6	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	1.4	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	2.2	--	--
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	--	--	--	--	--	--	--
	Oct/Nov 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
	Oct/Nov 1998	--	--	--	--	--	--	--	0.8	--	7.8
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	--
	Oct/Nov 1998	--	--	--	--	--	--	--	3.6	--	--

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 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	--	--	--	--	--	--	--	--	2.7(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	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	**20**
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	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	8.2
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
	Oct/Nov 1998	--	**10**	--	--	--	--	--	1.6	--	13

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 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	--	--	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	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	0.7	--	--
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	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	0.8	--	--	--	--	--	--	--
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
	Oct/Nov 1998	--	1.1	**8.3**	--	--	--	--	0.6	1.3 cis-1,2-Dichloroethene	--
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	--
	Oct/Nov 1998	--	--	**6.7**	--	--	--	--	0.6	1.4 cis-1,2-Dichloroethene	4.0

TABLE 3-4

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(concentrations in µg/L)

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

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
MW-22(1)											
Screen 1	Sep/Oct 1997	--	--	2.0	0.7	--	--	--	--	--	--
	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
	Oct/Nov 1998	--	--	1.7	0.7	--	--	--	--	--	5.0
Screen 2	Sep/Oct 1997	--	--	--	--	--	--	--	--	0.8 Dichloromethane	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	4.9
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
Screen 3	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	15
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
Screen 4	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
Screen 5	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	
	Oct/Nov 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
	Oct/Nov 1998	0.8	15	--	--	--	--	--	1.9	--	21
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
	Oct/Nov 1998	--	0.6	0.7	0.6	--	--	--	0.6	--	16

TABLE 3-4

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(concentrations in µg/L)

Values above state and/or Federal MCLs or action levels are 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	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	1.7 Dichloromethane[b]	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
Screen 4	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	2.3 Dichloromethane[b]	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
Screen 5	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	1.7 Dichloromethane[b] 3.0 Unknown (RT=3.93)	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	3.1 2-Methyl-1-propene	17
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**
	Oct/Nov 1998	**1.0**	1.3	--	--	--	--	--	0.8	--	16
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**
	Oct/Nov 1998	**19**	2.3	0.8	--	--	0.8	--	5.9	--	**490**
Screen 3	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
Screen 4	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 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 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	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 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

RESULTS OF METALS ANALYSIS OF GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 1998

(concentrations in mg/L)

Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sample Number	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-1	MW-984-001	--	--	--	--	1.14
MW-3						
Screen 1	MW-984-002	--	--	--	--	3.76
Screen 2	MW-984-003	--	--	--	--	4.35
Screen 3	MW-984-004	--	--	--	--	3.34
Screen 4	MW-984-005	--	--	--	--	1.27
Screen 5	MW-984-006	--	--	--	--	4.18
MW-4						
Screen 1	MW-984-007	--	--	--	--	2.72
Screen 2	MW-984-008	--	--	0.010	--	3.39
Screen 2 (DUP)	MW-984-009	--	--	--	--	3.39
Screen 3	MW-984-010	--	--	--	--	1.24
Screen 4	MW-984-011	--	--	--	--	2.70
Screen 5	MW-984-012	--	--	--	--	2.94
MW-5	MW-984-013	--	--	--	--	4.17
MW-6	MW-984-014	--	--	0.037	--	3.77
MW-7	MW-984-015	--	--	--	--	1.22
MW-8	MW-984-016	--	--	--	--	3.92
MW-9	MW-984-017	--	--	--	--	2.03
MW-10	MW-984-018	--	--	--	--	3.59
MW-10 DUP	MW-984-019	--	--	--	--	3.59
MW-11						
Screen 1	MW-984-020	--	--	--	--	1.39
Screen 2	MW-984-021	--	--	--	--	3.71
Screen 3	MW-984-022	--	0.008	--	--	4.47
Screen 4	MW-984-023	--	--	--	--	4.52
Screen 5	MW-984-024	--	--	--	--	1.42
MW-12						
Screen 1	MW-984-025	--	--	--	--	7.40
Screen 2	MW-984-026	--	--	--	--	4.86
Screen 2 (DUP)	MW-984-027	--	--	--	--	4.86
Screen 3	MW-984-028	--	--	--	--	4.16
Screen 4	MW-984-029	--	--	--	--	4.24
Screen 5	MW-984-030	--	--	--	--	1.28

TABLE 3-5

RESULTS OF METALS ANALYSIS OF GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 1998

(concentrations in mg/L)

Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sample Number	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-13	MW-984-031	--	--	0.036	0.029	3.43
MW-13 DUP	MW-984-032	--	--	0.037	0.029	3.43
MW-14						
Screen 1	MW-984-033	--	--	--	--	4.19
Screen 2	MW-984-034	--	--	--	--	4.27
Screen 3	MW-984-035	--	--	--	--	0.84
Screen 4	MW-984-036	--	--	--	--	2.26
Screen 5	MW-984-037	--	--	--	--	4.45
MW-15	MW-984-038	--	--	--	--	2.01
MW-16	MW-984-039	--	--	0.013	--	0.93
MW-17						
Screen 1	MW-984-040	--	--	--	--	0.46
Screen 2	MW-984-041	--	--	--	--	1.66
Screen 3	MW-984-042	--	--	--	--	4.39
Screen 4	MW-984-043	--	--	--	--	1.81
Screen 5	MW-984-044	--	--	--	--	5.07
MW-18						
Screen 1	MW-984-045	--	--	--	--	2.29
Screen 2	MW-984-046	--	--	--	--	1.94
Screen 3	MW-984-047	--	--	--	--	1.74
Screen 4	MW-984-048	--	--	--	--	4.61
Screen 5	MW-984-049	--	--	--	--	2.75
MW-19						
Screen 1	MW-984-050	--	--	--	--	12.5
Screen 2	MW-984-051	--	--	--	--	4.78
Screen 3	MW-984-052	--	--	--	--	3.40
Screen 4	MW-984-053	--	--	--	--	1.54
Screen 5	MW-984-054	--	--	--	--	2.45
MW-20						
Screen 1	MW-984-055	--	--	--	--	1.32
Screen 2	MW-984-056	--	--	--	--	2.38
Screen 3	MW-984-057	--	--	--	--	2.71
Screen 4	MW-984-058	--	--	--	--	2.63
Screen 5	MW-984-059	--	--	--	--	1.57

TABLE 3-5

RESULTS OF METALS ANALYSIS OF GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 1998

(concentrations in mg/L)

Values equal to or above state MCLs, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sample Number	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-21						
Screen 1	MW-984-060	--	--	--	--	2.20
Screen 2	MW-984-061	--	--	--	--	3.52
Screen 3	MW-984-062	--	--	--	--	4.79
Screen 4	MW-984-063	--	--	--	--	4.36
Screen 5	MW-984-064	--	--	--	--	14.1
MW-22						
Screen 1	MW-984-065	--	--	--	--	3.97
Screen 2	MW-984-066	--	--	--	--	4.13
Screen 3	MW-984-067	--	--	--	--	3.54
Screen 4	MW-984-068	--	--	--	--	4.34
Screen 5	MW-984-069	--	--	--	--	3.30
MW-23						
Screen 1	MW-984-070	--	--	0.010	--	6.34
Screen 2	MW-984-071	--	--	--	--	4.09
Screen 3	MW-984-072	--	--	--	--	4.48
Screen 4	MW-984-073	--	--	--	--	4.21
Screen 5	MW-984-074	--	--	--	--	2.48
MW-24						
Screen 1	MW-984-075	--	--	--	--	3.82
Screen 2	MW-984-076	--	--	--	--	8.30
Screen 3	MW-984-077	--	--	--	--	7.81
Screen 4	MW-984-078	--	--	--	--	8.30
Screen 5	MW-984-079	--	--	--	--	8.00
Practical Quantitation Limit		0.005	0.002	0.010	0.005	
California Maximum Contaminant Level		0.050	0.015[1]	0.050	NE	
EPA Maximum Contaminant Level		0.050	0.015[1]	0.100	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, (or other applicable regulatory limits), are 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
	Oct/Nov 1998	--	--	--	--	1.1
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
	Oct/Nov 1998	--	--	--	--	3.8
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
	Oct/Nov 1998	--	--	--	--	4.3
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
	Oct/Nov 1998	--	--	--	--	3.3
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
	Oct/Nov 1998	--	--	--	--	1.3

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, (or other applicable regulatory limits), are 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
	Oct/Nov 1998	--	--	--	--	4.2
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
	Oct/Nov 1998	--	--	--	--	2.7
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
	Oct/Nov 1998	--	--	0.010	--	3.4
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
	Oct/Nov 1998	--	--	--	--	1.2
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
	Oct/Nov 1998	--	--	--	--	2.7

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, (or other applicable regulatory limits), are 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
	Oct/Nov 1998	--	--	--	--	2.9
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
	Oct/Nov 1998	--	--	--	--	4.2
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
	Oct/Nov 1998	--	--	0.037	--	3.8
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
	Oct/Nov 1998	--	--	--	--	1.2
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
	Oct/Nov 1998	--	--	--	--	3.7

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, (or other applicable regulatory limits), are 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
	Oct/Nov 1998	--	--	--	--	2.1
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
	Oct/Nov 1998	--	--	--	--	3.6
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
	Oct/Nov 1998	--	--	--	--	1.4
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
	Oct/Nov 1998	--	--	--	--	3.7
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
	Oct/Nov 1998	--	0.008	--	--	4.5

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, (or other applicable regulatory limits), are 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
	Oct/Nov 1998	--	--	--	--	4.5
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
	Oct/Nov 1998	--	--	--	--	1.4
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
	Oct/Nov 1998	--	--	--	--	7.4
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
	Oct/Nov 1998	--	--	--	--	4.9
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
	Oct/Nov 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, (or other applicable regulatory limits), are 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
	Oct/Nov 1998	--	--	--	--	4.2
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
	Oct/Nov 1998	--	--	--	--	1.3
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
	Oct/Nov 1998	--	--	0.036	0.029	3.4
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
	Oct/Nov 1998	--	--	--	--	4.2
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
	Oct/Nov 1998	--	--	--	--	4.3

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, (or other applicable regulatory limits), are 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
	Oct/Nov 1998	--	--	--	--	0.8
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
	Oct/Nov 1998	--	--	--	--	2.3
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
	Oct/Nov 1998	--	--	--	--	4.5
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
	Oct/Nov 1998	--	--	--	--	2.0
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
	Oct/Nov 1998	--	--	0.013	--	0.9

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, (or other applicable regulatory limits), are 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
	Oct/Nov 1998	--	--	--	--	0.5
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
	Oct/Nov 1998	--	--	--	--	1.7
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
	Oct/Nov 1998	--	--	--	--	4.4
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
	Oct/Nov 1998	--	--	--	--	1.8
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
	Oct/Nov 1998	--	--	--	--	5.1

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, (or other applicable regulatory limits), are 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
	Oct/Nov 1998	--	--	--	--	2.3
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
	Oct/Nov 1998	--	--	--	--	1.9
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
	Oct/Nov 1998	--	--	--	--	1.7
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
	Oct/Nov 1998	--	--	--	--	4.6
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
	Oct/Nov 1998	--	--	--	--	2.8

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, (or other applicable regulatory limits), are 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
	Oct/Nov 1998	--	--	--	--	13.0
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
	Oct/Nov 1998	--	--	--	--	4.8
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
	Oct/Nov 1998	--	--	--	--	3.4
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
	Oct/Nov 1998	--	--	--	--	1.5
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
	Oct/Nov 1998	--	--	--	--	2.5

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, (or other applicable regulatory limits), are 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
	Oct/Nov 1998	--	--	--	--	1.3
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
	Oct/Nov 1998	--	--	--	--	2.4
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
	Oct/Nov 1998	--	--	--	--	2.7
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
	Oct/Nov 1998	--	--	--	--	2.6
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
	Oct/Nov 1998	--	--	--	--	1.6

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, (or other applicable regulatory limits), are 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
	Oct/Nov 1998	--	--	--	--	2.2
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
	Oct/Nov 1998	--	--	--	--	3.5
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
	Oct/Nov 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
	Oct/Nov 1998	--	--	--	--	4.4
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
	Oct/Nov 1998	--	--	--	--	14.0

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, (or other applicable regulatory limits), are 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
	Oct/Nov 1998	--	--	--	--	4.0
Screen 2	Sep/Oct 1997	--	--	--	--	4.9
	Jan/Feb 1998	--	--	--	--	4.2
	Apr/May 1998	--	--	--	--	4.7
	Jul/Aug 1998	--	--	--	--	4.4
	Oct/Nov 1998	--	--	--	--	4.1
Screen 3	Sep/Oct 1997	--	--	--	--	3.0
	Jan/Feb 1998	--	--	--	--	3.8
	Apr/May 1998	--	--	--	--	2.9
	Jul/Aug 1998	--	--	--	--	4.9
	Oct/Nov 1998	--	--	--	--	3.5
Screen 4	Sep/Oct 1997	--	--	--	--	2.8
	Jan/Feb 1998	--	--	--	--	3.7
	Apr/May 1998	--	--	--	--	3.0
	Jul/Aug 1998	--	--	--	--	4.0
	Oct/Nov 1998	--	--	--	--	4.3
Screen 5	Sep/Oct 1997	--	--	--	--	4.4
	Jan/Feb 1998	--	--	--	--	2.8
	Apr/May 1998	--	--	--	--	2.9
	Jul/Aug 1998	--	--	--	--	2.3
	Oct/Nov 1998	--	--	--	--	3.3
MW-23[1]						
Screen 1	Sep/Oct 1997	--	--	0.010	--	3.4
	Jan/Feb 1998	--	--	--	--	4.1
	Apr/May 1998	--	--	--	--	4.5
	Jul/Aug 1998	--	--	--	--	4.0
	Oct/Nov 1998	--	--	--	--	6.3
Screen 2	Sep/Oct 1997	--	--	--	--	4.9
	Jan/Feb 1998	--	--	--	--	4.9
	Apr/May 1998	--	--	--	--	4.7
	Jul/Aug 1998	--	--	--	--	3.4
	Oct/Nov 1998	--	--	--	--	4.1
Screen 3	Sep/Oct 1997	--	--	--	--	3.0
	Jan/Feb 1998	--	--	--	--	4.6
	Apr/May 1998	--	--	--	--	4.6
	Jul/Aug 1998	--	--	--	--	4.7
	Oct/Nov 1998	--	--	--	--	4.5
Screen 4	Sep/Oct 1997	--	--	--	--	4.9
	Jan/Feb 1998	--	--	--	--	4.5
	Apr/May 1998	--	--	--	--	4.9
	Jul/Aug 1998	--	--	--	--	4.6
	Oct/Nov 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, (or other applicable regulatory limits), are bold and shaded

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 5	Sep/Oct 1997	--	--	--	--	1.8
	Jan/Feb 1998	--	--	--	--	1.8
	Apr/May 1998	--	--	--	--	2.4
	Jul/Aug 1998	--	--	--	--	1.7
	Oct/Nov 1998	--	--	--	--	2.5
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
	Oct/Nov 1998	--	--	--	--	3.8
Screen 2	Sep/Oct 1997	--	--	--	--	4.4
	Jan/Feb 1998	--	--	--	--	4.9
	Apr/May 1998	--	--	--	--	4.5
	Jul/Aug 1998	--	--	--	--	4.8
	Oct/Nov 1998	--	--	--	--	8.3
Screen 3	Sep/Oct 1997	--	--	--	--	4.6
	Jan/Feb 1998	0.006	--	--	--	4.7
	Apr/May 1998	--	--	--	--	4.9
	Jul/Aug 1998	--	--	--	--	4.9
	Oct/Nov 1998	--	--	--	--	7.8
Screen 4	Sep/Oct 1997	--	--	--	--	4.0
	Jan/Feb 1998	--	--	--	--	4.9
	Apr/May 1998	--	--	--	--	4.3
	Jul/Aug 1998	--	--	--	--	4.8
	Oct/Nov 1998	--	--	--	--	8.3
Screen 5	Sep/Oct 1997	--	--	--	--	4.8
	Jan/Feb 1998	--	--	--	--	4.8
	Apr/May 1998	--	--	--	--	4.0
	Jul/Aug 1998	--	--	--	--	4.0
	Oct/Nov 1998	--	--	--	--	8.0
Practical Quantitation Limit		0.005	0.002	0.01	0.005	
Calif. Maximum Contaminant Level		0.05	(a)	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, OCTOBER-NOVEMBER 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	16	0.49	238	0.86	45	26	17	3.3	51	--	195	7.5
MW-3												
Screen 1	3.9	1.03	158	0.50	18	17	12	2.4	27	0.77	130	8.0
Screen 2	13	0.77	235	0.87	37	19	18	2.5	50	0.59	193	7.7
Screen 3	20	2.52	194	0.10	34	41	13	2.8	27	0.25	160	8.3
Screen 4	11	2.95	181	0.16	13	45	7.7	1.7	17	0.21	149	8.4
Screen 5	9.8	15.7	152	0.28	4.7	66	0.7	--	3.5	0.86	130	9.2
MW-4												
Screen 1	4.6	0.16	159	0.69	19	18	10	2.3	31	0.39	130	7.2
Screen 2	75	0.21	200	8.23	91	28	27	2.3	77	0.59	164	7.2
Screen 3	25	1.77	172	6.58	11	34	13	1.9	32	--	142	8.2
Screen 4	15	1.22	187	4.56	7.1	40	10	1.7	28	2.00	154	8.0
Screen 5	9.1	1.04	201	1.27	18	36	9.4	1.8	34	0.39	165	7.9
MW-5	7.2	0.09	143	0.80	20	13	9.9	2.3	30	0.60	117	7.0
MW-6	78	0.13	196	7.68	88	26	27	1.8	77	0.30	161	7.0
MW-7	26	0.28	169	6.71	53	19	18	2.5	52	--	139	7.4
MW-8	5.4	0.21	165	0.69	25	14	12	2.1	36	--	135	7.3
MW-9	20	0.26	198	0.71	41	19	15	2.8	48	--	162	7.3
MW-10	11	0.10	188	4.05	40	15	16	2.1	47	0.11	154	6.9
MW-11												
Screen 1	17	0.83	256	0.92	49	25	21	3.1	56	--	210	7.7
Screen 2	16	1.35	208	0.41	39	21	17	2.7	43	0.18	171	8.0
Screen 3	12	1.33	204	0.25	26	24	13	2.0	42	0.11	168	8.0
Screen 4	10	1.55	190	--	20	24	13	2.1	34	0.63	156	8.1
Screen 5	11	1.28	156	--	18	46	2.1	1.0	21	0.12	128	8.1
MW-12												
Screen 1	5.2	0.30	184	0.70	29	19	14	2.5	35	0.95	151	7.4
Screen 2	16	0.59	227	1.94	39	23	17	2.7	52	0.23	186	7.6
Screen 3	18	0.92	224	1.62	37	24	16	2.6	56	0.33	184	7.8
Screen 4	13	0.93	227	1.48	29	23	13	2.0	52	--	186	7.8
Screen 5	13	1.41	217	1.18	20	33	11	1.8	39	--	178	8.0
MW-13	28	0.21	207	10.8	66	27	21	2.6	63	--	170	7.2
MW-14												
Screen 1	134	0.10	242	23.2	243	41	48	2.4	143	1.80	198	6.8
Screen 2	12	0.56	344	18.3	196	34	52	2.5	144	0.29	282	7.4
Screen 3	92	0.99	242	16.3	125	36	40	2.8	92	--	199	7.8
Screen 4	38	1.25	192	13.4	31	27	19	2.0	54	--	158	8.0
Screen 5	8.1	6.52	159	0.19	17	32	12	2.2	16	0.23	133	8.8

TABLE 4-1

SUMMARY OF WATER-CHEMISTRY RESULTS FOR GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 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	25	0.23	221	2.33	59	22	19	2.9	58	0.18	181	7.2
MW-16	24	0.24	188	13.3E	52	24	21	2.3	55	--	154	7.3
MW-17												
Screen 1	4.1	0.12	152	0.26	17	12	10	1.8	31	--	125	7.1
Screen 2	6.4	3.91	151	0.69	24	15	17	2.5	22	0.14	125	8.6
Screen 3	11	0.62	191	1.17	34	18	16	1.8	41	0.51	157	7.7
Screen 4	13	0.84	205	2.31	31	25	13	1.3	45	0.16	168	7.8
Screen 5	13	1.31	201	2.24	30	26	13	1.4	43	0.72	165	8.0
MW-18												
Screen 1	5.6	0.17	163	0.73	26	13	12	2.1	36	--	134	7.2
Screen 2	11	0.33	204	1.04	36	18	16	2.4	47	0.11	167	7.4
Screen 3	14	1.53	235	0.77	37	21	19	2.8	51	--	193	8.0
Screen 4	9.0	1.27	196	0.96	23	31	10	1.2	38	0.25	161	8.0
Screen 5	10	12.9	158	--	4.6	51	4.6	1.5	7.7	--	134	9.1
MW-19												
Screen 1	4.0	0.36	140	0.35	17	11	9.7	2.0	29	0.95	115	7.6
Screen 2	26	0.13	201	3.84	50	17	21	1.8	56	0.46	165	7.0
Screen 3	90	0.33	256	10.3	83	31	34	2.5	94	0.62	210	7.3
Screen 4	20	0.44	212	2.99	39	23	18	1.7	50	0.20	174	7.5
Screen 5	69	0.70	272	8.27	68	31	31	2.4	85	0.46	223	7.6
MW-20												
Screen 1	58	0.64	195	15.7	140	23	31	3.2	92	--	160	7.7
Screen 2	13	1.44	176	2.51	31	16	17	1.8	38	--	145	8.1
Screen 3	34	1.53	236	3.44	25	54	13	1.9	39	--	194	8.0
Screen 4	10	4.14	160	--	19	59	2.9	--	9.6	0.18	133	8.6
Screen 5	8.2	4.32	167	--	22	53	3.8	1.5	15	--	138	8.6
MW-21												
Screen 1	67	0.06	196	15.2	110	29	30	1.9	90	--	161	6.7
Screen 2	110	0.68	332	11.7	190	49	47	2.9	135	0.88	272	7.5
Screen 3	115	0.42	324	9.68	110	40	38	3.0	118	0.23	206	7.3
Screen 4	84	0.45	274	11.5	90	30	32	2.5	96	0.25	225	7.4
Screen 5	69	0.82	251	10.5	83	32	29	2.5	85	2.40	206	7.7
MW-22												
Screen 1	110	0.13	249	10.5	149	31	43	2.6	113	1.20	204	6.9
Screen 2	59	0.56	216	9.89	57	32	26	2.3	65	0.25	177	7.6
Screen 3	30	1.16	178	9.71	20	34	15	1.9	42	0.52	146	8.0
Screen 4	11	0.55	169	4.45	6.8	27	9.6	1.6	30	0.29	139	7.7
Screen 5	7.7	8.45	130	--	46	74	1.1	1.1	5.3	0.12	110	9.0

TABLE 4-1

SUMMARY OF WATER-CHEMISTRY RESULTS FOR GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 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	35	0.14	215	7.12	62	27	24	2.0	64	1.96	176	7.0
Screen 2	104	0.25	245	14.7	140	35	41	2.6	115	0.61	201	7.2
Screen 3	24	0.69	168	9.78	13	28	14	1.7	41	0.27	138	7.8
Screen 4	13	0.67	163	6.16	5.7	28	11	1.8	31	0.20	134	7.8
Screen 5	26	46.6	227	--	35	122	1.1	2.7	5.1	0.15	202	9.5
MW-24												
Screen 1	9.8	0.60	183	1.25	32	16	15	2.2	44	0.29	150	7.7
Screen 2	30	1.68	163	2.87	15	39	11	2.5	26	0.74	134	8.2
Screen 3	28	0.83	202	2.13	18	39	12	2.0	36	1.50	166	7.8
Screen 4	13	1.88	183	3.72	7.8	40	9.9	1.8	25	0.42	151	8.2
Screen 5	9.3	1.08	209	1.09	22	40	8.9	1.8	35	0.43	172	7.9
Detection Limit	1.0	0.001	0.001	0.10	2.0	1.0	1.0	1.0	1.0	0.10	2.0	

--: Not detected.
E: Estimated value; result exceeded calibration range.

TABLE 4-2

GENERAL WATER TYPES OBSERVED DURING THE OCTOBER-NOVEMBER 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 3
Screen 4	Type 1/3
Screen 5	Type 2

Well/Screen Number	Water Type
MW-15	Type 1/3
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 1/3
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

Well/Screen Number	Water Type
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 1/2
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, OCTOBER-NOVEMBER 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	5.34	5.18	10.52	1.5	280	268	1.1
MW-3							
Screen 1	3.13	3.14	6.27	0.2	180	154	1.2
Screen 2	5.06	4.91	9.97	1.5	290	258	1.1
Screen 3	4.47	4.27	8.74	2.3	260	236	1.1
Screen 4	3.55	3.5	7.05	0.7	200	187	1.1
Screen 5	2.99	3.11	6.10	2.0	180	176	1.0
MW-4							
Screen 1	3.16	3.23	6.39	1.1	180	164	1.1
Screen 2	7.89	7.37	15.26	3.4	470	408	1.2
Screen 3	4.24	4.22	8.46	0.2	240	210	1.1
Screen 4	3.97	4.01	7.98	0.5	250	201	1.2
Screen 5	4.03	4.08	8.11	0.6	210	210	1.0
MW-5	3.01	2.93	5.94	1.3	180	154	1.2
MW-6	7.81	7.23	15.04	3.9	460	402	1.1
MW-7	5.09	4.92	10.01	1.7	320	260	1.2
MW-8	3.43	3.46	6.89	0.4	220	177	1.2
MW-9	4.72	4.56	9.28	1.7	270	245	1.1
MW-10	4.51	4.33	8.84	2.0	250	227	1.1
MW-11							
Screen 1	5.77	5.65	11.42	1.1	320	298	1.1
Screen 2	4.71	4.54	9.25	1.8	280	243	1.2
Screen 3	4.25	4.28	8.53	0.4	210	221	1.0
Screen 4	3.82	3.83	7.65	0.1	200	198	1.0
Screen 5	3.23	3.24	6.47	0.2	180	176	1.0
MW-12							
Screen 1	3.83	3.79	7.62	0.5	250	198	1.3
Screen 2	5.12	5.04	10.16	0.8	310	264	1.2
Screen 3	5.09	5.15	10.24	0.6	310	266	1.2
Screen 4	4.81	4.74	9.55	0.7	310	247	1.3
Screen 5	4.43	4.31	8.74	1.4	250	227	1.1
MW-13	6.33	6.14	12.47	1.5	410	321	1.3
MW-14							
Screen 1	14.5	12.9	27.4	5.8	670	756	0.9
Screen 2	14.3	13	27.3	4.8	780	732	1.1
Screen 3	10.3	9.48	19.8	4.1	600	523	1.1
Screen 4	5.83	5.48	11.3	3.1	310	280	1.1
Screen 5	3.25	3.2	6.45	0.8	180	172	1.0

TABLE 4-3

SUMMARY OF QUALITY CONTROL ANALYSES OF WATER-CHEMISTRY DATA FROM GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 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	5.71	5.49	11.2	2.0	300	296	1.0
MW-16	5.79	5.63	11.4	1.4	350	285	1.2
MW-17							
Screen 1	2.99	3.00	5.99	0.2	180	152	1.2
Screen 2	3.24	3.23	6.47	0.2	200	167	1.2
Screen 3	4.24	4.18	8.42	0.7	270	218	1.2
Screen 4	4.52	4.41	8.93	1.2	270	231	1.2
Screen 5	4.45	4.41	8.86	0.5	280	230	1.2
MW-18							
Screen 1	3.43	3.43	6.86	0.0	210	176	1.2
Screen 2	4.47	4.47	8.94	0.0	260	232	1.1
Screen 3	5.08	5.09	10.17	0.1	320	263	1.2
Screen 4	4.02	4.09	8.11	0.9	240	210	1.1
Screen 5	3.06	3.04	6.1	0.3	190	171	1.1
MW-19							
Screen 1	2.79	2.79	5.58	0.0	170	143	1.2
Screen 2	5.34	5.32	10.66	0.2	330	275	1.2
Screen 3	9.2	8.93	18.1	1.5	540	472	1.1
Screen 4	5.08	4.99	10.07	0.9	290	259	1.1
Screen 5	8.4	8.25	16.7	0.9	490	430	1.1
MW-20							
Screen 1	8.87	8.22	17.1	3.8	520	459	1.1
Screen 2	4.1	4.01	8.11	1.1	230	207	1.1
Screen 3	5.6	5.4	11.0	1.8	300	287	1.0
Screen 4	3.34	3.27	6.61	1.1	190	183	1.0
Screen 5	3.46	3.4	6.86	0.9	190	190	1.0
MW-21							
Screen 1	8.48	8.26	16.7	1.3	500	439	1.1
Screen 2	13.3	12.8	26.1	1.9	730	710	1.0
Screen 3	11.5	10.9	22.4	2.7	650	594	1.1
Screen 4	9.56	8.8	18.4	4.1	540	481	1.1
Screen 5	8.53	8.11	16.6	2.5	480	437	1.1
MW-22							
Screen 1	11	10.6	21.6	1.9	600	583	1.0
Screen 2	7.09	6.87	13.96	1.6	410	358	1.1
Screen 3	4.89	4.81	9.7	0.8	280	242	1.2
Screen 4	3.54	3.5	7.04	0.6	200	174	1.2
Screen 5	3.36	3.61	6.97	3.6	330	207	1.6

TABLE 4-3

SUMMARY OF QUALITY CONTROL ANALYSES OF WATER-CHEMISTRY DATA FROM GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, OCTOBER-NOVEMBER 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	6.32	6.38	12.7	0.5	310	329	0.9
Screen 2	10.9	10.7	21.6	0.9	580	574	1.0
Screen 3	4.4	4.47	8.87	0.8	240	215	1.1
Screen 4	3.6	3.75	7.35	2.0	180	178	1.0
Screen 5	5.5	5.72	11.22	2.0	300	350	0.9
MW-24							
Screen 1	4.04	4.15	8.19	1.3	250	211	1.2
Screen 2	4.06	4.00	8.06	0.7	250	210	1.2
Screen 3	4.65	4.56	9.21	1.0	270	239	1.1
Screen 4	3.81	3.84	7.65	0.4	200	193	1.0
Screen 5	4.24	4.25	8.49	0.1	240	222	1.1

Shaded Values are outside ideal range.

TABLE 5-1

GROUNDWATER MONITORING WELL WATER-LEVEL MEASUREMENTS, OCTOBER 19-20, 1998

Well Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-1	10/19-20/98	30.56	1116.69	1094.23
MW-3				
Screen 1 (top)	10/19-20/98	110.42	1100.34	989.92
Screen 2	10/19-20/98	119.27	1100.34	981.07
Screen 3	10/19-20/98	123.51	1100.34	976.83
Screen 4	10/19-20/98	193.04	1100.34	907.30
Screen 5	10/19-20/98	231.86	1100.34	868.48
MW-4				
Screen 1 (top)	10/19-20/98	86.49	1082.84	996.35
Screen 2	10/19-20/98	100.44	1082.84	982.40
Screen 3	10/19-20/98	103.71	1082.84	979.13
Screen 4	10/19-20/98	112.39	1082.84	970.45
Screen 5	10/19-20/98	185.14	1082.84	897.70
MW-5	10/19-20/98	75.89	1071.62	995.73
MW-6	10/19-20/98	188.21	1188.54	1000.33
MW-7	10/19-20/98	NA	1212.90	NA
MW-8	10/19-20/98	142.32	1139.55	997.23
MW-9	10/19-20/98	18.47	1106.06	1087.59
MW-10	10/19-20/98	93.14	1087.73	994.59
MW-11				
Screen 1 (top)	10/19-20/98	115.50	1139.30	1023.80
Screen 2	10/19-20/98	145.71	1139.30	993.59
Screen 3	10/19-20/98	161.22	1139.30	978.08
Screen 4	10/19-20/98	170.42	1139.30	968.88
Screen 5	10/19-20/98	227.02	1139.30	912.28
MW-12				
Screen 1 (top)	10/19-20/98	101.11	1102.14	1001.03
Screen 2	10/19-20/98	116.58	1102.14	985.56
Screen 3	10/19-20/98	120.28	1102.14	981.86
Screen 4	10/19-20/98	133.65	1102.14	968.49
Screen 5	10/19-20/98	191.70	1102.14	910.44
MW-13	10/19-20/98	187.58	1183.49	995.91

TABLE 5-1

GROUNDWATER MONITORING WELL WATER-LEVEL MEASUREMENTS, OCTOBER 19-20, 1998

Well Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-14				
Screen 1 (top)	10/19-20/98	171.59	1173.47	1001.88
Screen 2	10/19-20/98	172.36	1173.47	1001.11
Screen 3	10/19-20/98	172.58	1173.47	1000.89
Screen 4	10/19-20/98	172.57	1173.47	1000.90
Screen 5	10/19-20/98	173.50	1173.47	999.97
MW-15	10/19-20/98	29.06	1120.68	1091.62
MW-16	10/19-20/98	239.66	1236.29	996.63
MW-17				
Screen 1 (top)	10/19-20/98	200.42	1191.21	990.79
Screen 2	10/19-20/98	216.68	1191.21	974.53
Screen 3	10/19-20/98	229.68	1191.21	961.53
Screen 4	10/19-20/98	287.43	1191.21	903.78
Screen 5	10/19-20/98	296.87	1191.21	894.34
MW-18				
Screen 1 (top)	10/19-20/98	244.86	1225.41	980.55
Screen 2	10/19-20/98	246.21	1225.41	979.20
Screen 3	10/19-20/98	251.34	1225.41	974.07
Screen 4	10/19-20/98	284.36	1225.41	941.05
Screen 5	10/19-20/98	301.35	1225.41	924.06
MW-19				
Screen 1 (top)	10/19-20/98	163.35	1142.94	979.59
Screen 2	10/19-20/98	180.20	1142.94	962.74
Screen 3	10/19-20/98	187.26	1142.94	955.68
Screen 4	10/19-20/98	290.20	1142.94	852.74
Screen 5	10/19-20/98	293.83	1142.94	849.11
MW-20				
Screen 1 (top)	10/19-20/98	202.64	1165.05	962.41
Screen 2	10/19-20/98	202.76	1165.05	962.29
Screen 3	10/19-20/98	220.75	1165.05	944.30
Screen 4	10/19-20/98	236.43	1165.05	928.62
Screen 5	10/19-20/98	201.50	1165.05	963.55

TABLE 5-1

GROUNDWATER MONITORING WELL WATER-LEVEL MEASUREMENTS, OCTOBER 19-20, 1998

Well Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-21				
Screen 1 (top)	10/19-20/98	62.38	1059.10	996.72
Screen 2	10/19-20/98	62.05	1059.10	997.05
Screen 3	10/19-20/98	62.72	1059.10	996.38
Screen 4	10/19-20/98	64.04	1059.10	995.06
Screen 5	10/19-20/98	64.26	1059.10	994.84
MW-22				
Screen 1 (top)	10/19-20/98	181.03	1176.98	995.95
Screen 2	10/19-20/98	183.94	1176.98	993.04
Screen 3	10/19-20/98	183.86	1176.98	993.12
Screen 4	10/19-20/98	202.22	1176.98	974.76
Screen 5	10/19-20/98	213.94	1176.98	963.04
MW-23				
Screen 1 (top)	10/19-20/98	113.78	1108.84	995.06
Screen 2	10/19-20/98	119.22	1108.84	989.62
Screen 3	10/19-20/98	119.95	1108.84	988.89
Screen 4	10/19-20/98	141.14	1108.84	967.70
Screen 5	10/19-20/98	142.71	1108.84	966.13
MW-24				
Screen 1 (top)	10/19-20/98	204.61	1200.94	996.33
Screen 2	10/19-20/98	212.55	1200.94	988.39
Screen 3	10/19-20/98	215.97	1200.94	984.97
Screen 4	10/19-20/98	241.85	1200.94	959.09
Screen 5	10/19-20/98	261.63	1200.94	939.31

TABLE 5-2

GROUNDWATER MONITORING WELL WATER-LEVEL MEASUREMENTS NOVEMBER 20, 1998

Well Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-1	11/20/98	30.56	1116.69	1094.37
MW-3				
Screen 1 (top)	11/20/98	114.02	1100.34	986.32
Screen 2	11/20/98	122.62	1100.34	977.72
Screen 3	11/20/98	127.10	1100.34	973.24
Screen 4	11/20/98	207.93	1100.34	892.41
Screen 5	11/20/98	233.49	1100.34	866.85
MW-4				
Screen 1 (top)	11/20/98	89.96	1082.84	992.88
Screen 2	11/20/98	102.83	1082.84	980.01
Screen 3	11/20/98	105.95	1082.84	976.89
Screen 4	11/20/98	115.60	1082.84	967.24
Screen 5	11/20/98	195.80	1082.84	887.04
MW-5	11/20/98	75.89	1071.62	992.85
MW-6	11/20/98	188.21	1188.54	999.64
MW-7	11/20/98	NA	1212.90	NA
MW-8	11/20/98	142.32	1139.55	993.59
MW-9	11/20/98	18.47	1106.06	1087.68
MW-10	11/20/98	93.14	1087.73	992.08
MW-11				
Screen 1 (top)	11/20/98	115.66	1139.30	1023.64
Screen 2	11/20/98	147.81	1139.30	991.49
Screen 3	11/20/98	163.41	1139.30	975.89
Screen 4	11/20/98	172.22	1139.30	967.08
Screen 5	11/20/98	234.34	1139.30	904.96
MW-12				
Screen 1 (top)	11/20/98	105.42	1102.14	996.72
Screen 2	11/20/98	119.00	1102.14	983.14
Screen 3	11/20/98	122.53	1102.14	979.61
Screen 4	11/20/98	136.78	1102.14	965.36
Screen 5	11/20/98	200.85	1102.14	901.29
MW-13	11/20/98	187.58	1183.49	993.16

TABLE 5-2

GROUNDWATER MONITORING WELL WATER-LEVEL MEASUREMENTS NOVEMBER 20, 1998

Well Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-14				
Screen 1 (top)	11/20/98	171.87	1173.47	1001.60
Screen 2	11/20/98	172.46	1173.47	1001.01
Screen 3	11/20/98	172.68	1173.47	1000.79
Screen 4	11/20/98	172.59	1173.47	1000.88
Screen 5	11/20/98	173.40	1173.47	1000.07
MW-15	11/20/98	29.06	1120.68	1091.92
MW-16	11/20/98	239.66	1236.29	992.74
MW-17				
Screen 1 (top)	11/20/98	205.64	1191.21	985.57
Screen 2	11/20/98	218.67	1191.21	972.54
Screen 3	11/20/98	230.67	1191.21	960.54
Screen 4	11/20/98	288.60	1191.21	902.61
Screen 5	11/20/98	298.58	1191.21	892.63
MW-18				
Screen 1 (top)	11/20/98	248.79	1225.41	976.62
Screen 2	11/20/98	249.68	1225.41	975.73
Screen 3	11/20/98	253.45	1225.41	971.96
Screen 4	11/20/98	284.85	1225.41	940.56
Screen 5	11/20/98	300.56	1225.41	924.85
MW-19				
Screen 1 (top)	11/20/98	165.61	1142.94	977.33
Screen 2	11/20/98	180.87	1142.94	962.07
Screen 3	11/20/98	188.38	1142.94	954.56
Screen 4	11/20/98	295.06	1142.94	847.88
Screen 5	11/20/98	298.83	1142.94	844.11
MW-20				
Screen 1 (top)	11/20/98	201.55	1165.05	963.50
Screen 2	11/20/98	202.39	1165.05	962.66
Screen 3	11/20/98	217.00	1165.05	948.05
Screen 4	11/20/98	231.30	1165.05	933.75
Screen 5	11/20/98	202.06	1165.05	962.99

TABLE 5-2

GROUNDWATER MONITORING WELL WATER-LEVEL MEASUREMENTS NOVEMBER 20, 1998

Well Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-21				
Screen 1 (top)	11/20/98	63.95	1059.10	995.15
Screen 2	11/20/98	63.48	1059.10	995.62
Screen 3	11/20/98	64.09	1059.10	995.01
Screen 4	11/20/98	65.41	1059.10	993.69
Screen 5	11/20/98	65.48	1059.10	993.62
MW-22				
Screen 1 (top)	11/20/98	182.53	1176.98	994.45
Screen 2	11/20/98	184.27	1176.98	992.71
Screen 3	11/20/98	184.27	1176.98	992.71
Screen 4	11/20/98	202.72	1176.98	974.26
Screen 5	11/20/98	214.47	1176.98	962.51
MW-23				
Screen 1 (top)	11/20/98	115.96	1108.84	992.88
Screen 2	11/20/98	121.09	1108.84	987.75
Screen 3	11/20/98	121.64	1108.84	987.20
Screen 4	11/20/98	144.67	1108.84	964.17
Screen 5	11/20/98	145.07	1108.84	963.77
MW-24				
Screen 1 (top)	11/20/98	207.65	1200.94	993.29
Screen 2	11/20/98	214.17	1200.94	986.77
Screen 3	11/20/98	217.25	1200.94	983.69
Screen 4	11/20/98	242.84	1200.94	958.10
Screen 5	11/20/98	266.50	1200.94	934.44

FIGURES

JPLF1-1.DWG

Explanation

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

800 400 0 800

SCALE IN FEET

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

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MW-1 MW-7 MW-16 MW-11 MW-15 MW-9 MW-24 MW-22 MW-6 MW-8 MW-12 MW-13 MW-14 MW-23 MW-3 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

FIGURE 1-1

LOCATIONS OF JPL GROUNDWATER MONITORING WELLS AND NEARBY MUNICIPAL PRODUCTION WELLS

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

9-25-98

layr1_31.dwg

Jet Propulsion Laboratory

MW-1 ---
MW-2
MW-3 1:---
MW-4 1:---
MW-5 ---
MW-6 ---
MW-7 51
MW-8 ---
MW-9 ---
MW-10 ---
MW-11 1:1.4
MW-12 1:---
MW-13 9.0
MW-14 1:---
MW-15 ---
MW-16 51
MW-17 1:---
MW-18 1:--- 2:---
MW-19 1:---
MW-20 1:---
MW-21 1:---
MW-22 1:---
MW-23 1:0.8
MW-24 1:1.0
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 RD
VIRO RD
OAK GROVE DR
FOOTHILL BLVD
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
- 5 Concentration Contour (µg/L)
- MCL Maximum Contaminant Level (0.5 µ g/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 3-1

CONTOURS OF CARBON TETRACHLORIDE CONCENTRATIONS IN AQUIFER LAYER 1

OCTOBER-NOVEMBER 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

3-4-99

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Jet Propulsion Laboratory

MW-1
MW-2
MW-3
2: --
3: 5.8
MW-4
2: 0.9
3: --
4: --
MW-5
MW-6
MW-7
MW-8
MW-9
MW-10
MW-11
2: 0.6
3: 1.3
4: --
MW-12
2: 1.3
3: 27
4: 4.1
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: 19
3: --
MH-01

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

Valley Water Company
WELL #3 10/98 --
WELL #2 10/98 --
WELL #4 10/98 --
WELL #1 10/98 --

City of Pasadena Arroyo Well
11/98 --

City of Pasadena Well 52
8/98 1.6
9/98 1.6
11/98 1.6

City of Pasadena Ventura Well
8/98 --
9/98 --
11/98 --

City of Pasadena Windsor Well
8/98 --
9/98 --
11/98 --

Lincoln Ave. Water Co. Well #3

Lincoln Ave. Water Co. Well #5
11/98 --

Las Flores Water Co. Well #2

Rubio Canon Land and Water Co. Wells
WELL #4 7/98 --
WELL #7 7/98 --
#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 (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
OCTOBER-NOVEMBER 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

3-4-99

layr3_33.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: 2.0
MW-13
MW-14
4: --
5: --
MW-15
MW-16
MW-17
4: --
5: --
MW-18
4: 3.4
5: --
MW-21
4: --
5: --
MW-22
4: --
5: --
MW-23
4: --
5: --
MW-24
4: --
5: --
MH-01

La Canada Irrigation District Wells

#6
#1
#3
#2
#4
#1

Valley Water Company

WELL #3 10/98 --
WELL #2 10/98 --
WELL #4 10/98 --
WELL #1 10/98 --

City of Pasadena Arroyo Well
11/98 --

City of Pasadena Well 52
8/98 1.6
9/98 1.6
11/98 1.6

City of Pasadena Ventura Well
8/98 --
9/98 --
11/98 --

City of Pasadena Windsor Well
8/98 --
9/98 --
11/98 --

Lincoln Ave. Water Co. Well #3

Lincoln Ave. Water Co. Well #5
11/98 --

Rubio Cañon Land and Water Co. Wells
WELL #4 7/98 --
WELL #7 7/98 --

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 RD
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
- 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

OCTOBER-NOVEMBER 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

3-4-99

layr1_34.dwg

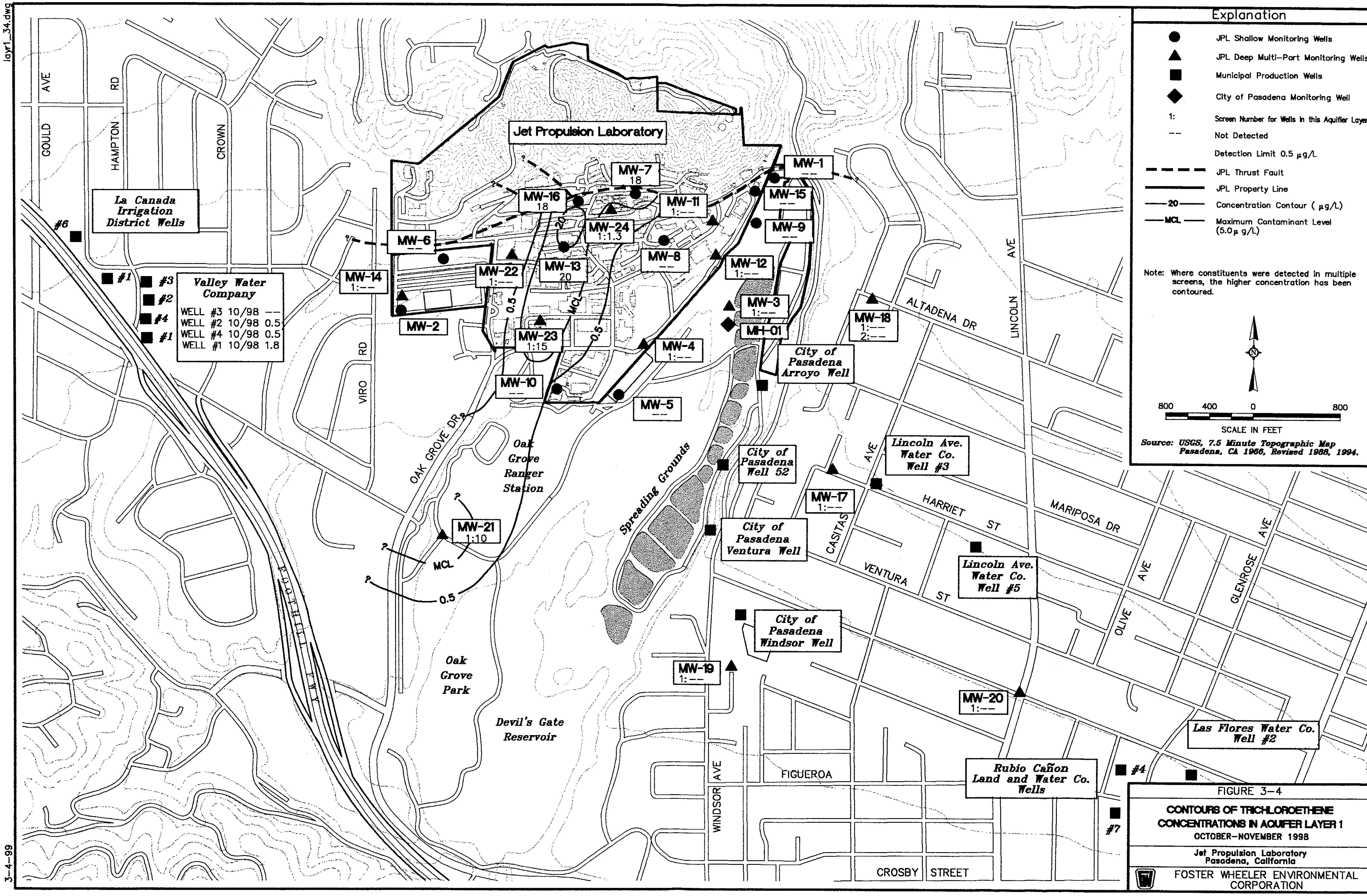

Explanation
JPL Shallow Monitoring Wells
JPL Deep Multi-Port Monitoring Wells
Municipal Production Wells
City of Pasadena Monitoring Well
1: Screen Number for Wells in this Aquifer Layer
-- Not Detected
Detection Limit 0.5 µg/L
JPL Thrust Fault
JPL Property Line
20 Concentration Contour (µg/L)
MCL Maximum Contaminant Level (5.0µ g/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.
Jet Propulsion Laboratory
MW-1 --
MW-7 18
MW-16 18
MW-11 1:--
MW-15 --
MW-24 1:1.3
MW-9 --
MW-6 --
MW-8 --
MW-13 20
MW-12 1:--
MW-22 1:--
MW-14 1:--
MW-3 1:--
MH-01
MW-2
MW-23 1:15
MW-4 1:--
MW-18 1:-- 2:--
MW-10 --
MW-5 --
MW-21 1:10
MW-17 1:--
MW-19 1:--
MW-20 1:--
20
0.5
MCL
0.5
?
?
?
MCL
0.5
La Canada Irrigation District Wells
#6
#1
#3
#2
#4
#1
Valley Water Company
WELL #3 10/98 --
WELL #2 10/98 0.5
WELL #4 10/98 0.5
WELL #1 10/98 1.8
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
Spreading Grounds
Oak Grove Park
Devil's Gate Reservoir
GOULD AVE
HAMPTON RD
CROWN
VIRO RD
OAK GROVE DR
FOOTHILL FWY
ALTADENA DR
LINCOLN AVE
HARRIET ST
MARIPOSA DR
CASITAS AVE
VENTURA ST
OLIVE AVE
GLENROSE AVE
WINDSOR AVE
FIGUEROA
CROSBY STREET

FIGURE 3–4

CONTOURS OF TRICHLOROETHENE CONCENTRATIONS IN AQUIFER LAYER 1

OCTOBER–NOVEMBER 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

3-4-99

layr2_35.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 0.5 µg/L
- JPL Thrust Fault
- JPL Property Line
- 0.5 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.

Jet Propulsion Laboratory

MW-1
MW-2
MW-3 2: -- 3: 0.7
MW-4 2: 2.4 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: 0.6 3: --
MW-15
MW-16
MW-17 2: -- 3: 1.9
MW-18 3: 1.4
MW-19 2: -- 3: --
MW-20 2: --
MW-21 2: -- 3: --
MW-22 2: -- 3: --
MW-23 2: 0.6 3: --
MW-24 2: 2.3 3: --
MH-01

La Canada Irrigation District Wells

#6 #1 #3 #2 #4 #1

Valley Water Company

WELL #3	10/98	--
WELL #2	10/98	0.5
WELL #4	10/98	0.5
WELL #1	10/98	1.8

City of Pasadena Arroyo Well 11/98 --

City of Pasadena Well 52

8/98	3.5
9/98	3.3
11/98	2.7

City of Pasadena Ventura Well

8/98	1.0
9/98	1.2
11/98	1.1

City of Pasadena Windsor Well

8/98	0.7
9/98	0.9
11/98	1.0

Lincoln Ave. Water Co. Well #3

Lincoln Ave. Water Co. Well #5 11/98 12.3

Rubio Cañon Land and Water Co. Wells

WELL #4	7/98	--
WELL #7	7/98	--

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

0.5
MCL

3-4-99

FIGURE 3-5

CONTOURS OF TRICHLOROETHENE CONCENTRATIONS IN AQUIFER LAYER 2

OCTOBER-NOVEMBER 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

layr3_36.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: 6.2 5: 11
MW-18 4: 0.8 5: --
MW-19 4: -- 5: --
MW-20 3: -- 4: --
MW-21 4: 1.1 5: --
MW-22 4: -- 5: --
MW-23 4: -- 5: --
MW-24 4: -- 5: --
MH-01

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

Valley Water Company
WELL #3 10/98 --
WELL #2 10/98 0.5
WELL #4 10/98 0.5
WELL #1 10/98 1.8

City of Pasadena Arroyo Well
11/98 --

City of Pasadena Well 52
8/98 3.5
9/98 3.3
11/98 2.7

City of Pasadena Ventura Well
8/98 1.0
9/98 1.2
11/98 1.1

City of Pasadena Windsor Well
8/98 0.7
9/98 0.9
11/98 1.0

Lincoln Ave. Water Co. Well #3

Lincoln Ave. Water Co. Well #5
11/98 12.3

Rubio Cañon Land and Water Co. Wells
WELL #4 7/98 --
WELL #7 7/98 --

Las Flores Water Co. Well #2
#4
#7

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

0.5
MCL

GOULD AVE
HAMPTON RD
CROWN RD
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

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
- 0.5 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
OCTOBER-NOVEMBER 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

3-4-99

layr1_37.dwg

Jet Propulsion Laboratory

MW-7 0.7
MW-16 1.5
MW-11 1:--
MW-24 1:--
MW-1 --
MW-15 --
MW-9 --
MW-6 --
MW-8 --
MW-12 1:--
MW-14 1:--
MW-22 1:--
MW-13 --
MW-3 1:--
MW-2
MW-23 1:--
MW-01
MW-18 1:-- 2:--
MW-4 1:--
MW-10 --
MW-5 --

La Canada Irrigation District Wells
#6

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

City of Pasadena Arroyo Well

Oak Grove Ranger Station

City of Pasadena Well 52

Lincoln Ave. Water Co. Well #3

MW-17 1:--

City of Pasadena Ventura Well

Lincoln Ave. Water Co. Well #5

MW-21 1:--

Spreading Grounds

City of Pasadena Windsor Well

MW-19 1:--

MW-20 1:--

Las Flores Water Co. Well #2

Oak Grove Park

Devil's Gate Reservoir

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

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
- MCL — Maximum Contaminant Level (0.5 µ g/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
OCTOBER-NOVEMBER 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

3-4-99

layr1_38.dwg

Jet Propulsion Laboratory

MW-1 --
MW-2
MW-3 1:--
MW-4 1:--
MW-5 --
MW-6 0.7
MW-7 0.9
MW-8 --
MW-9 --
MW-10 --
MW-11 1:--
MW-12 1:--
MW-13 --
MW-14 1:0.5
MW-15 --
MW-16 1.0
MW-17 1:--
MW-18 1:-- 2:--
MW-19 1:--
MW-20 1:--
MW-21 1:--
MW-22 1:1.7
MW-23 1:--
MW-24 1:--
MH-01

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

Valley Water Company

WELL #3	10/98	1.4
WELL #2	10/98	7.6
WELL #4	10/98	4.3
WELL #1	10/98	10.0

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 RD
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

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
- 0.5 Concentration Contour (µg/L)

NOTES

1. Where constituents were detected in multiple screens, the higher concentration has been contoured.
2. Maximum contaminant level (5.0 µg/L) was not exceeded.

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

OCTOBER-NOVEMBER 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

3-8-99

layr2_39.dwg

Jet Propulsion Laboratory

MW-1
MW-2
MW-4
2: 0.7
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: 1.5
3: ---
MW-15
MW-16
MW-17
2: ---
3: ---
MW-18
3: 0.8
MW-19
2: ---
3: 2.0
MW-20
2: ---
MW-21
2: ---
3: 0.8
MW-22
2: ---
3: ---
MW-23
2: 0.7
3: ---
MW-24
2: 0.8
3: ---

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

Valley Water Company
WELL #3 10/98 1.4
WELL #2 10/98 7.6
WELL #4 10/98 4.3
WELL #1 10/98 10.0

City of Pasadena Arroyo Well
11/98 ---

City of Pasadena Well 52
8/98 ---
9/98 ---
11/98 ---

City of Pasadena Ventura Well
8/98 0.5
9/98 0.6
11/98 0.5

City of Pasadena Windsor Well
8/98 1.0
9/98 1.2
11/98 1.0

Lincoln Ave. Water Co. Well #3

Lincoln Ave. Water Co. Well #5
11/98 0.7

Las Flores Water Co. Well #2

Rubio Cañon Land and Water Co. Wells
WELL #4 7/98 ---
WELL #7 7/98 ---

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
ALTADENA DR
LINCOLN AVE
CASITAS AVE
HARRIET ST
MARIPOSA DR
VENTURA ST
OLIVE AVE
GLENROSE AVE
WINDSOR AVE
FIGUEROA
CROSBY STREET
FOOTHILL FWY

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
- 0.5 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 TETRACHLOROETHENE CONCENTRATIONS IN AQUIFER LAYER 2
OCTOBER-NOVEMBER 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

3-4-99

lyr3_310.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: 0.5 5: 0.8
MW-18 4: 1.5 5: --
MW-19 4: -- 5: 1.5
MW-20 3: -- 4: --
MW-21 4: 8.3 5: 6.7
MW-22 4: -- 5: --
MW-23 4: -- 5: --
MW-24 4: -- 5: --
MH-01

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

Valley Water Company
WELL #3 10/98 1.4
WELL #2 10/98 7.6
WELL #4 10/98 4.3
WELL #1 10/98 10.0

City of Pasadena Arroyo Well
11/98 --

City of Pasadena Well 52
8/98 --
9/98 --
11/98 --

City of Pasadena Ventura Well
8/98 0.5
9/98 0.6
11/98 0.5

City of Pasadena Windsor Well
8/98 1.0
9/98 1.2
11/98 1.0

Lincoln Ave. Water Co. Well #3

Lincoln Ave. Water Co. Well #5
11/98 0.7

Rubio Cañon Land and Water Co. Wells
WELL #4 7/98 --
WELL #7 7/98 --

Las Flores Water Co. Well #2
#4 #7

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

0.5
MCL
?

GOULD AVE
HAMPTON RD
CROWN RD
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
- 0.5 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
OCTOBER-NOVEMBER 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

3-4-99

lyr1_311.dwg

Jet Propulsion Laboratory

MW-1 —
MW-2 —
MW-3 1:—
MW-4 1:—
MW-5 —
MW-6 —
MW-7 210
MW-8 —
MW-9 —
MW-10 —
MW-11 1:—
MW-12 1:—
MW-13 86
MW-14 1:4.2
MW-15 —
MW-16 220
MW-17 1:—
MW-18 1:— 2:—
MW-19 1:—
MW-20 1:7.8
MW-21 1:13
MW-22 1:5.0
MW-23 1:21
MW-24 1:16
MH-01

4.0
IAL

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

Valley Water Company

WELL #3	8/98	4.6
WELL #2	8/98	4.1
WELL #4	8/98	4.6
WELL #1	8/98	—

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 4.0 µg/L
- JPL Thrust Fault
- JPL Property Line
- 14 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

OCTOBER-NOVEMBER 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

3-4-99

lyr2_312.dwg

Jet Propulsion Laboratory

MW-1
MW-2
MW-3
2: ---
3: ---
MW-4
2: 25
3: ---
4: ---
MW-5
MW-6
MW-7
MW-8
MW-9
MW-10
MW-11
2: ---
3: ---
4: ---
MW-12
2: 4.2
3: 6.9
4: 7.7
MW-13
MW-14
2: 4.2
3: 6.7
MW-15
MW-16
MW-17
2: ---
3: 5.1
MW-18
3: ---
MW-19
2: ---
3: 4.2
MW-20
2: ---
MW-21
2: ---
3: ---
MW-22
2: ---
3: ---
MW-23
2: 16
3: ---
MW-24
2: 490
3: ---
MH-01

4.0
200
IAL

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

Valley Water Company

WELL #3	8/98	4.6
WELL #2	8/98	4.1
WELL #4	8/98	4.6
WELL #1	8/98	---

City of Pasadena Arroyo Well

City of Pasadena Well 52

8/98	25
9/98	28
10/98	27
11/98	22

City of Pasadena Ventura Well

8/98	5.0
9/98	5.0
10/98	5.9
11/98	5.3

City of Pasadena Windsor Well

8/98	5.0
9/98	---
10/98	---
11/98	---

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 RD
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

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 4.0 µg/L
- JPL Thrust Fault
- JPL Property Line
- 4.0 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

OCTOBER-NOVEMBER 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

3-4-99

lyr3_313.dwg

Jet Propulsion Laboratory

MW-1
MW-2
MW-3
4: --
5: 91
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: 12
5: 12
MW-18
4: 19
5: --
MW-19
4: --
5: --
MW-20
3: --
4: 20
MW-21
4: --
5: 4.0
MW-22
4: --
5: --
MW-23
4: --
5: 17
MW-24
4: --
5: --
MH-01

4.0

IAL

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

Valley Water Company
WELL #3 8/98 4.6
WELL #2 8/98 4.1
WELL #4 8/98 4.6
WELL #1 8/98 --

City of Pasadena Arroyo Well

City of Pasadena Well 52
8/98 25
9/98 28
10/98 27
11/98 22

City of Pasadena Ventura Well
8/98 5.0
9/98 5.0
10/98 5.9
11/98 5.3

City of Pasadena Windsor Well
8/98 5.0
9/98 --
10/98 --
11/98 --

Lincoln Ave. Water Co. Well #3
Lincoln Ave. Water Co. Well #5
Rubio Cañon Land and Water Co. Wells
Las Flores Water Co. Well #2
#4
#7

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

GOULD AVE
HAMPTON RD
CROWN RD
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 4.0 µg/L
- JPL Thrust Fault
- JPL Property Line
- 4.0 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 3-13

CONTOURS OF PERCHLORATE CONCENTRATIONS IN AQUIFER LAYER 3
OCTOBER-NOVEMBER 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

3-4-99

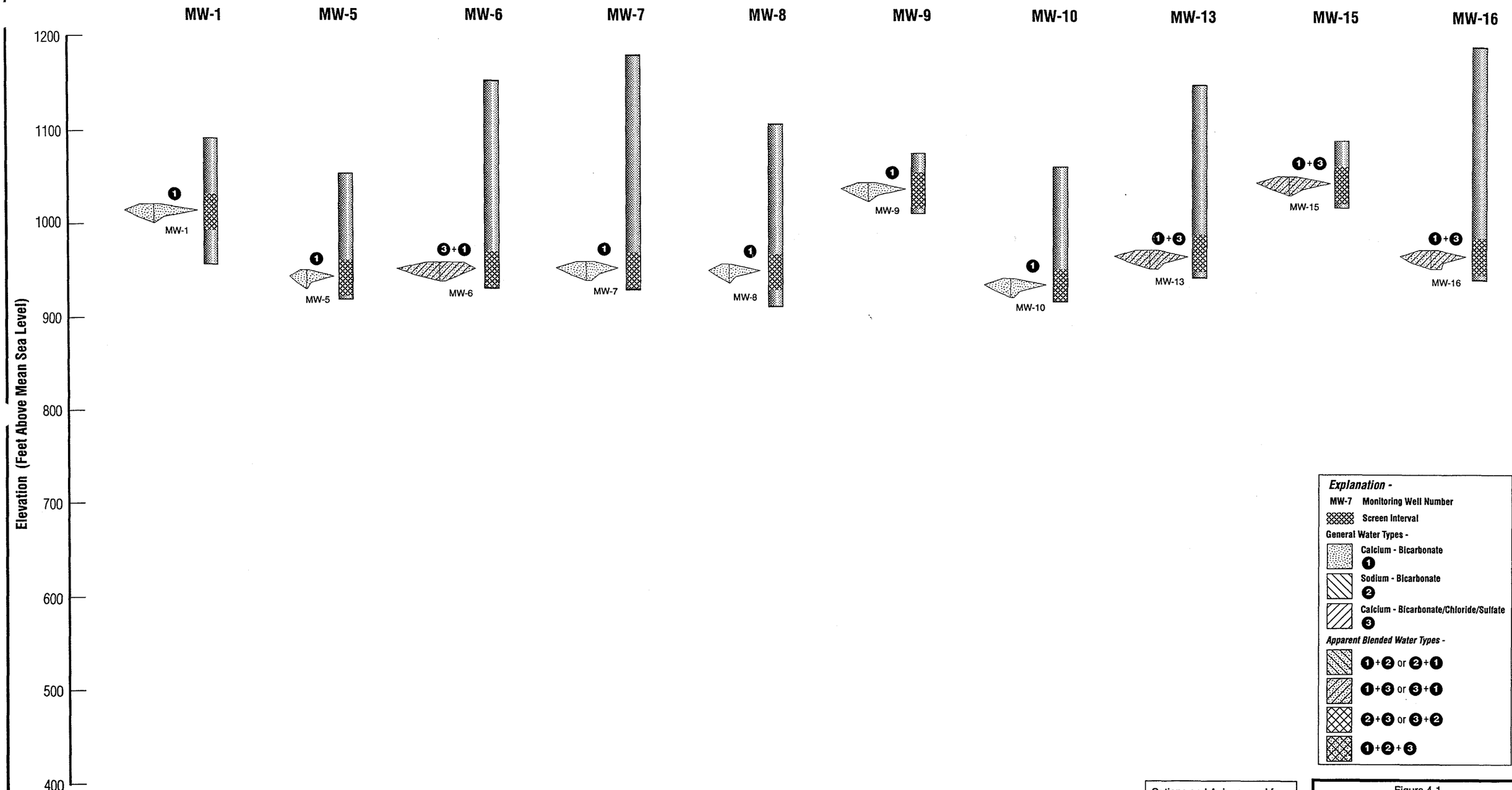


Figure 4-1

Stiff Diagrams for On-Site JPL Shallow Monitoring Wells October - November, 1998

Jet Propulsion Laboratory
Pasadena, California

1572.0244

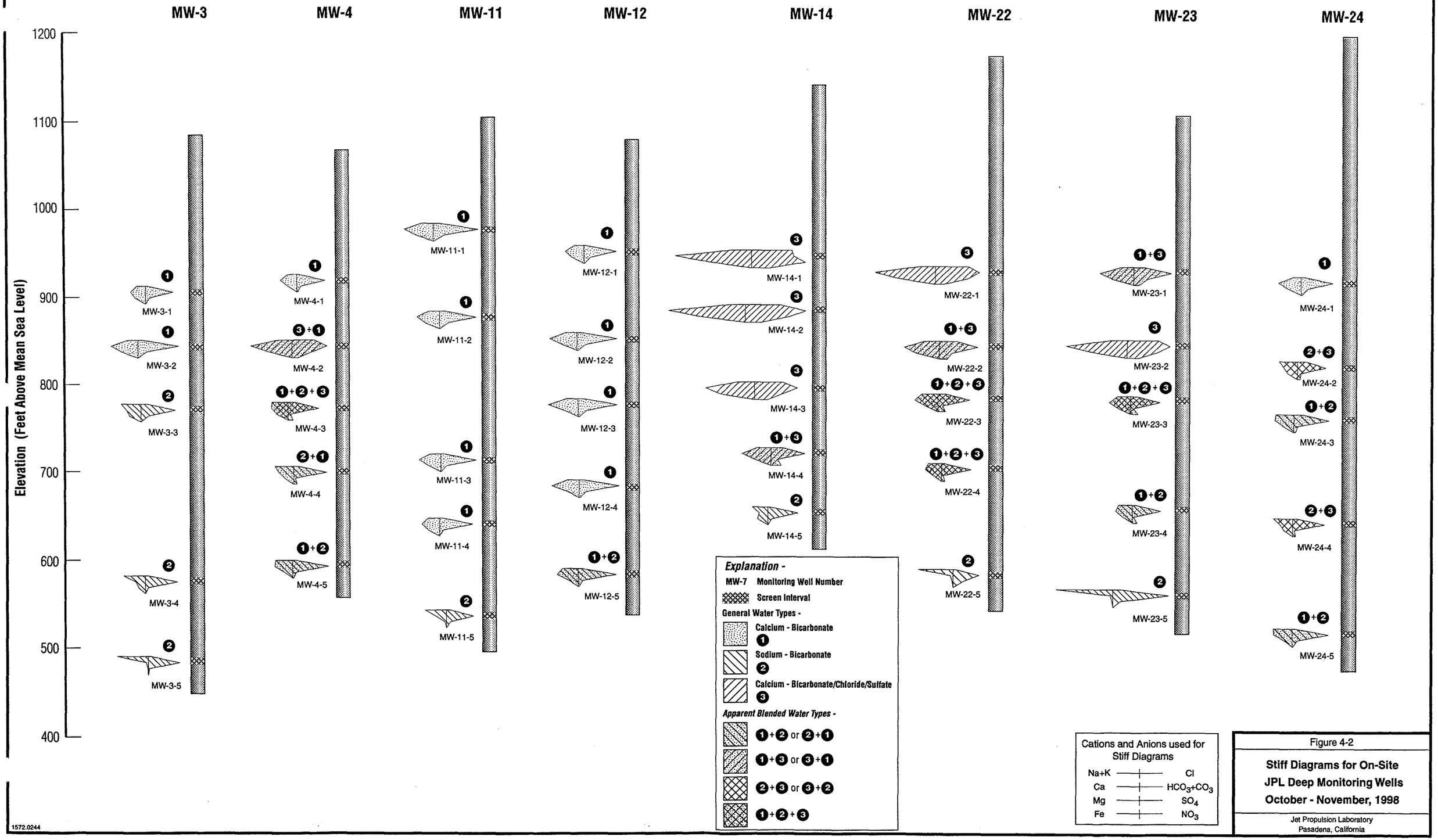
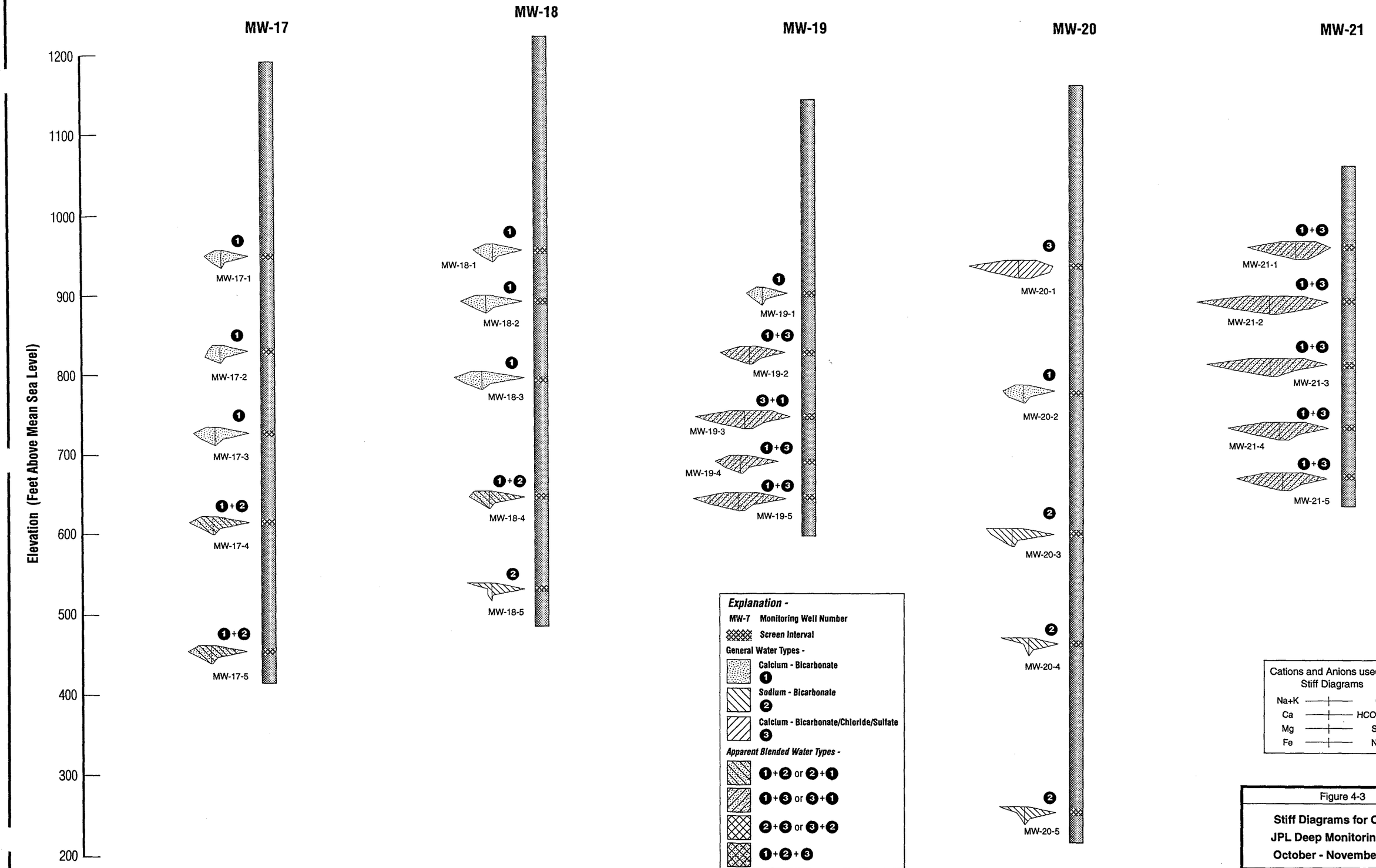


Figure 4-2

Stiff Diagrams for On-Site JPL Deep Monitoring Wells October - November, 1998

Jet Propulsion Laboratory
Pasadena, California

1572.0244



1572.0244

Figure 4-3

Stiff Diagrams for Off-Site JPL Deep Monitoring Wells October - November, 1998

Jet Propulsion Laboratory
Pasadena, California

5-1.DWG

Jet Propulsion Laboratory

MW-1 1094.23
MW-16 996.63
MW-7 –
MW-11 1023.80
MW-15 1091.62
MW-9 1087.59
MW-6 1000.33
MW-22 995.95
MW-24 996.33
MW-8 997.23
MW-12 1001.03
MW-13 995.91
MW-14 1001.88
MW-23 995.06
MW-3 989.92
MW-4 996.35
MH-01
MW-18 980.55
MW-2
MW-10 994.59
MW-5 995.73
MW-21 996.72
MW-17 990.79
MW-19 979.59
MW-20 962.41

1090 1080 1070 1060 1050 1040 1030 1020 1010 1000 995 990 985 980 975 970 965 960

La Canada Irrigation District
#6
#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
- JPL Thrust Fault
- Direction of groundwater flow
- – Water table elevation could not be measured due to Calgon pilot test (MW-7)

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

October 19-20, 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

3-8-99

5-2.DWG

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

MW-1 1094.37
MW-2
MW-3 986.32
MW-4 992.88
MW-5 992.85
MW-6 999.64
MW-7 –
MW-8 993.59
MW-9 1087.68
MW-10 992.08
MW-11 1023.64
MW-12 996.72
MW-13 993.16
MW-14 1001.60
MW-15 1091.92
MW-16 992.74
MW-17 985.57
MW-18 976.62
MW-19 977.33
MW-20 963.50
MW-21 995.15
MW-22 994.45
MW-23 992.88
MW-24 993.29
MH-01

#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

1000 995 990 985 980 975 970 965 960 955 950 945 940 935 930 925 920 915 910 905 900 895 890 885 880 875 870 865 860 855 850 845 840 835 830 825 820 815 810 805 800 795 790 785 780 775 770 765 760 755 750 745 740 735 730 725 720 715 710 705 700 695 690 685 680 675 670 665 660 655 650 645 640 635 630 625 620 615 610 605 600 595 590 585 580 575 570 565 560 555 550 545 540 535 530 525 520 515 510 505 500 495 490 485 480 475 470 465 460 455 450 445 440 435 430 425 420 415 410 405 400 395 390 385 380 375 370 365 360 355 350 345 340 335 330 325 320 315 310 305 300 295 290 285 280 275 270 265 260 255 250 245 240 235 230 225 220 215 210 205 200 195 190 185 180 175 170 165 160 155 150 145 140 135 130 125 120 115 110 105 100 95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- JPL Thrust Fault
- Direction of groundwater flow
- – Water table elevation could not be measured due to Calgon pilot test (MW-7)

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 5-2

WATER-TABLE ELEVATION CONTOUR MAP

November 20, 1998

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

3-8-99

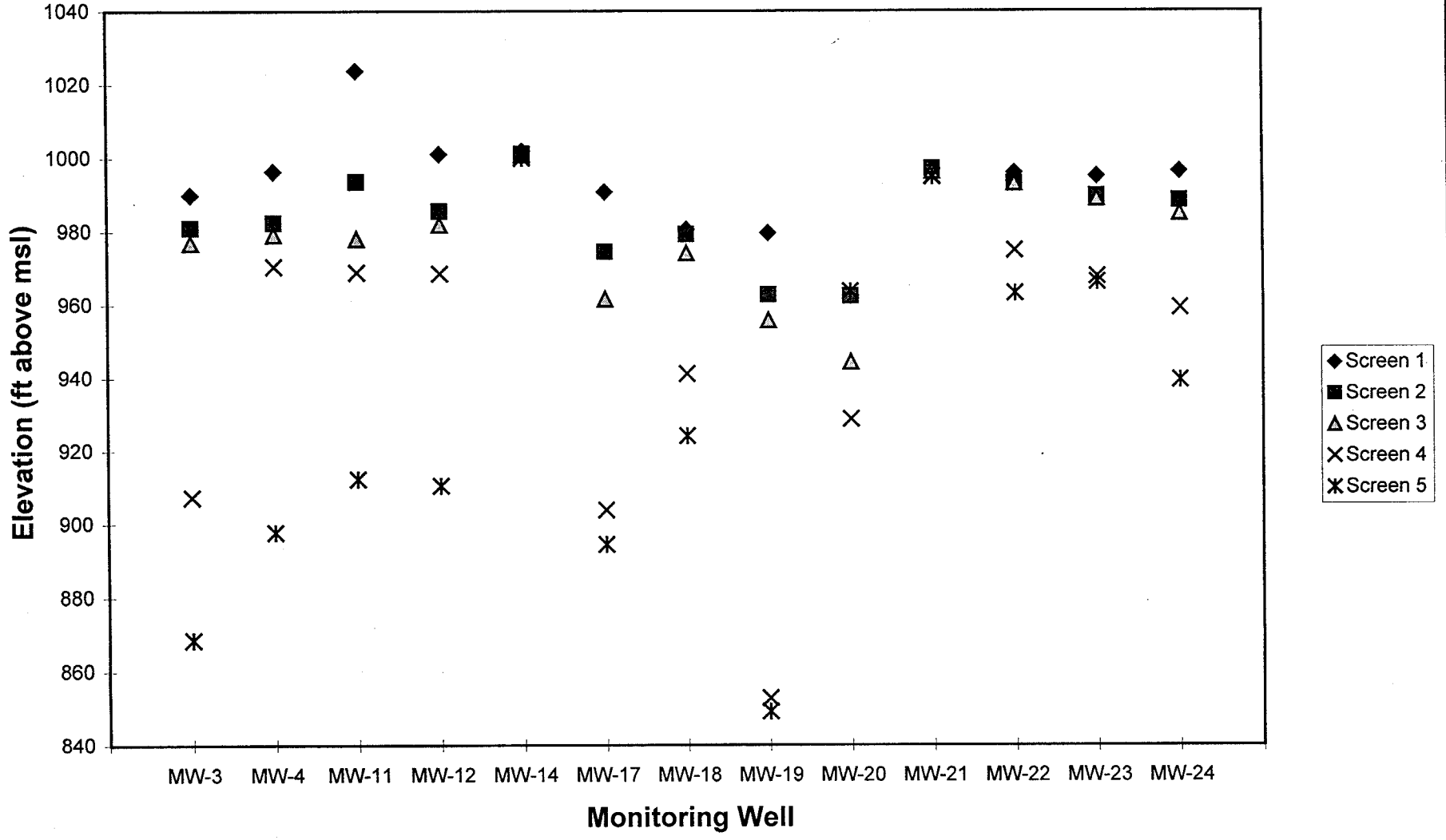


Figure 5-3

HYDRAULIC HEAD ELEVATIONS

FROM DEEP (MP) WELLS

October 19-20, 1998

Jet Propulsion Laboratory

Pasadena, California

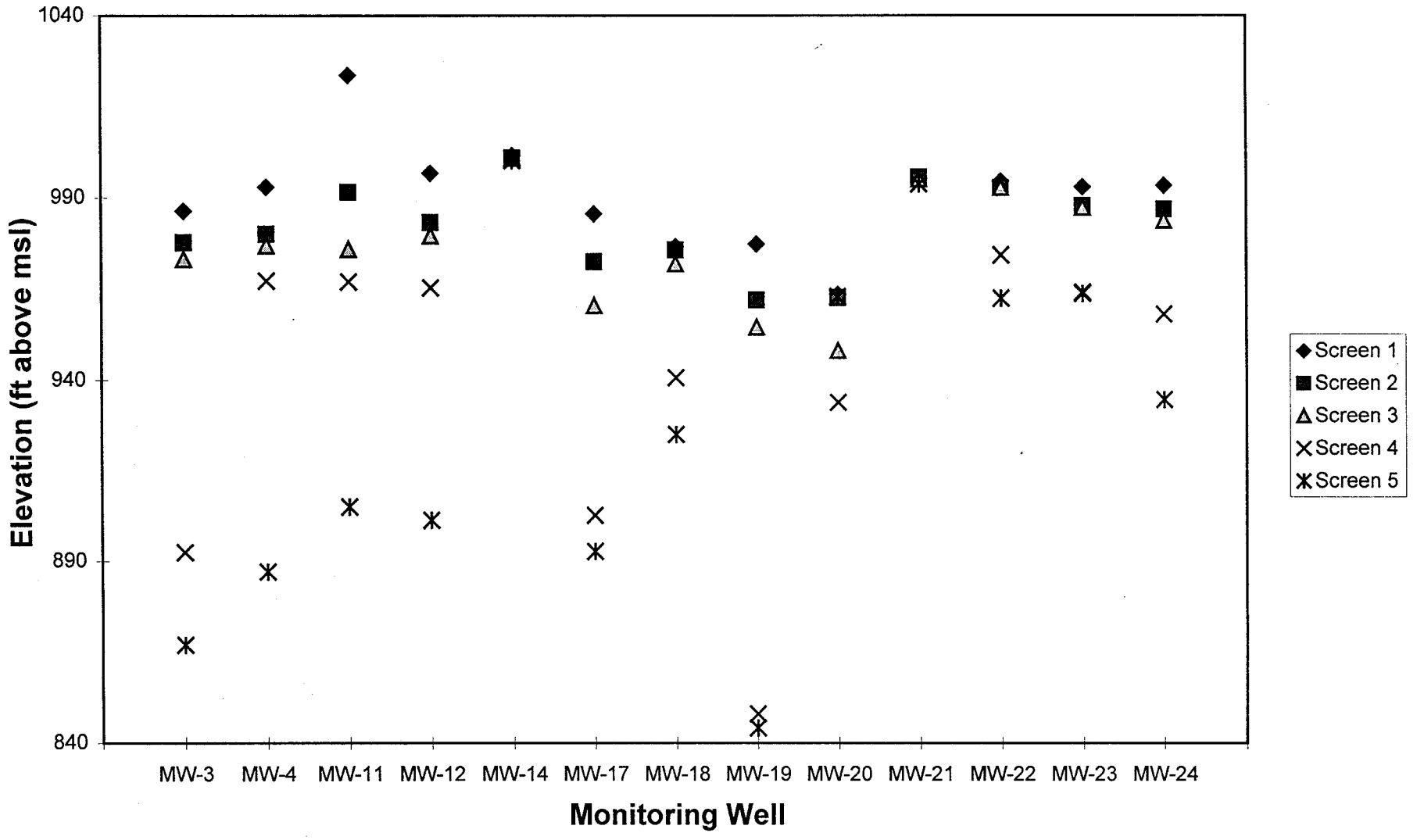


Figure 5-4

HYDRAULIC HEAD ELEVATIONS

FROM DEEP (MP) WELLS

November 20, 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 : JPL
Project Number : 1572 0260
Date : 11/13/98
Site Engineer : J. BRENNER, B DIMESNIL
Well Number : MW-1
Equipment : DRT-15CE
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	22.39	TOP OF 4" CASING	22.39
Depth to Sediment (ft)	119.14	TOP OF 4" CASING	119.14
Thickness of Sediment (ft)	0.86		0.86

Depth of Well (ft) 120.0
Diameter of Casing (ft) 0.333
Water Column Height (ft) 96.75
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 62.9
Casing Volumes Purged 1.0
Total Volume Purged (gals) 63

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1010	9.63	3.94	19.3	475	1.8	PUMP ON / CONTROL
						BOX SET AT HZ
1015	9.64	3.51	19.2	466	1.9	WATER CLEAR
1020	8.15	2.04	18.7	436	1.8	WATER CLEAR
1025	7.48	3.11	17.2	418	1.8	WATER CLEAR
1030	7.33	2.44	17.3	419	1.8	WATER CLEAR
1035	7.23	2.72	17.2	430	1.8	WATER CLEAR
1040	7.17	1.78	17.0	436	1.8	WATER CLEAR
1043	7.22	1.14	17.1	437	1.8	READY TO SAMPLE
1045	—	—	—	—	0.02	FLOW REDUCED,
						COLLECT MW-984-00,
1050	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET AT 27' BGS

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0260
Date : 11/13/98
Site Engineer : J. BRENNER, B. DUMESNIL
Well Number : MW-5
Equipment : YSI 3500
DIP-ISCE
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	78.31	TOP OF 4" CASING	78.31
Depth to Sediment (ft)	133.80	TOP OF 4" CASING	133.80
Thickness of Sediment (ft)	6.2		6.2

Depth of Well (ft) 140.00
Diameter of Casing (ft) 0.333
Water Column Height (ft) 55.49
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 36.1
Casing Volumes Purged 2.1
Total Volume Purged (gals) 77

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1240	7.60	19.8	16.7	281	2.2	PUMP ON, CONTROL BOX AT 25 Hz
1245	6.90	12.1	17.7	269	2.2	WATER SLIGHTLY CLOUDY
1250	6.90	23.0	17.2	264	2.2	WATER SLIGHTLY CLOUDY
1255	6.92	20.6	18.8	258	2.2	WATER SL. CLOUDY
1300	7.02	20.6	16.7	254	2.2	WATER SL. CLOUDY
1305	6.95	13.8	17.2	257	2.2	WATER CLEARING
1310	6.99	7.41	17.1	260	2.2	WATER CLEAR
1313	6.96	4.17	16.8	250	2.2	READY TO SAMPLE
1315	—	—	—	—	0.02	FLOW REDUCED, COLLECT MW-9804-013
1320	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET AT 134 BGS

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0460
Date : 11/13/98
Site Engineer : J. BRENNER / B. DUMESNIL
Well Number : MW-6
Equipment : YSI 3500
DRG-1SCE
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	186.78	TOP OF 4" CASING	186.78
Depth to Sediment (ft)	238.90	TOP OF 4" CASING	238.90
Thickness of Sediment (ft)	6.1		6.1

Depth of Well (ft) 245.00
Diameter of Casing (ft) 0.333
Water Column Height (ft) 52.12
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 33.9
Casing Volumes Purged 1.44
Total Volume Purged (gals) 49.0

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1600	7.12	179	21.7	716	1.4	PUMP ON; CONTROL
						BOX AT 319 HZ
1605	6.97	46.8	22.5	715	1.4	WATER CLOUDY
1610	7.01	30.2	22.8	717	1.4	WATER CLOUDY
1615	6.97	15.4	23.1	724	1.4	WATER SLIGHTLY CLOUDY
1620	7.08	7.99	22.6	724	1.4	WATER CLEARING
1625	~~6.96~~	4.57	22.8	721	1.4	WATER CLEAR
1630	7.14	3.77	22.0	718	1.4	WATER CLEAR
1633	7.09	2.96	22.3	720	1.4	READY TO SAMPLE
1635	—	—	—	—	0.02	FLOW REDUCED; COLLECT
						MW-9899-014
1636	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET AT 192' BTOC

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0260
Date : 10/25/98
Site Engineer : J. BRENNER, B. DOMENIC
Well Number : MW-7
Equipment : DEL-15CE
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* NOT MEASURED DUE TO PUMP TEST SYSTEM		
Depth to Sediment (ft)	OCCUPYING WELL AT THE TIME OF SAMPLING		
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) = N/A
Casing Volumes Purged N/A
Total Volume Purged (gals) N/A

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1345	7.29	3.76	21.8	455	4.0	PUMP ON
1349	7.15	2.15	20.5	462	4.0	WATER CLEAR
1351	7.09	1.52	20.3	461	4.0	WATER CLEAR
1354	7.21	1.12	20.2	458	4.0	WATER CLEAR
1357	7.23	1.22	20.2	457	4.0	WATER CLEAR
1400	—	—	—	—	0.2	COLLECT MW-98A-015
1405	—	—	—	—	—	PUMP OFF
#1345	—	—	—	—	—	COLLECT MW-98A-200 (FIELD BLANK)

Notes Sampling Procedures: ____

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0260
Date : 10/28/98
Site Engineer : J. BRENNER, B. DUMENSIL
Well Number : MW-8
Equipment : DAT-15CE
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	143.49	TOP OF 4" CASING	143.49
Depth to Sediment (ft)	197.20	TOP OF 4" CASING	197.20
Thickness of Sediment (ft)	7.8		7.8

Depth of Well (ft) 205.0
Diameter of Casing (ft) 0.333
Water Column Height (ft) 53.71
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 34.9
Casing Volumes Purged 1.5
Total Volume Purged (gals) 52.5

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1500	7.40	6.07	18.6	274	1.5	PUMP ON; CONTROL BOX
1505	7.46	4.25	19.2	272	1.5	SET AT 300 Hz
1510	7.10	3.98	19.6	277	1.5	WATER CLEAR
1515	7.37	3.71	18.9	280	1.5	WATER CLEAR
1520	7.05	5.22	19.6	287	1.5	WATER CLEAR
1525	7.20	5.87	19.6	292	1.5	WATER CLEAR
1528	7.13	5.98	20.2	292	1.5	~~READY TO SAMPLE~~
1531	7.15	4.38	19.8	297	1.5	WATER CLEAR
1534	7.20	3.92	17.6	297	1.5	READY TO SAMPLE
1535	—	—	—	—	0.2	FLOW REDUCED; SAMPLE
						MW-98-016 COLLECTED
1540	—	—	—	—	—	PUMP OFF AT MW-8

Notes Sampling Procedures: PUMP SET AT 150' bgs

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0260
Date : 11/13/98
Site Engineer : J. BIENNER, B. DIMENNA

Well Number : MW-[redacted]9
Equipment : DRT-15CE
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	18.46	TOP OF 4" CASING	18.46
Depth to Sediment (ft)	66.83	TOP OF 4" CASING	66.83
Thickness of Sediment (ft)	3.17		3.17

Depth of Well (ft) 70.0
Diameter of Casing (ft) 0.333
Water Column Height (ft) 48.37
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 31.5
Casing Volumes Purged 1.6
Total Volume Purged (gals) 51.0

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0840	7.51	7.21	17.7	411	1.7	PUMP ON, CONTROL BOX SET AT 175Hz
0845	7.18	4.07	17.9	401	1.7	WATER CLEAR
0850	7.17	3.43	18.2	402	1.7	WATER CLEAR
0855	7.05	2.88	18.4	401	1.7	WATER CLEAR
0900	7.14	2.53	18.4	403	1.7	WATER CLEAR
0905	7.10	2.34	18.0	404	1.7	WATER CLEAR
0909	7.12	2.03	18.7	406	1.7	READY TO SAMPLE
0910	—	—	—	—	0.02	FLOW REDUCED, COLLECT MW-954-0171
0915	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET AT 23' BGS

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0660
Date : 11/13/95
Site Engineer : J. Brennan, B Dumbuil

Well Number : MW-10
Equipment : Digi-ISCO
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	95.39	TOP OF 4" CASING	95.39
Depth to Sediment (ft)	150.60	TOP OF 4" CASING	150.60
Thickness of Sediment (ft)	4.4		4.4
Depth of Well (ft)	155.00		
Diameter of Casing (ft)	0.333		
Water Column Height (ft)	55.21		

Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 35.9

Casing Volumes Purged 1.2

Total Volume Purged (gals) 42.0

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1440	6.67	10.24	19.5	342	1.2	PUMP ON; CONTROL
						BOX SET AT 254 Hz.
1445	6.71	6.46	19.5	346	1.2	WATER CLEAR
1450	6.70	4.02	19.3	350	1.2	WATER CLEAR
1455	6.71	8.15	19.5	361	1.2	WATER CLEAR
1500	6.76	7.37	19.3	374	1.2	WATER CLEAR
1505	6.84	4.42	19.2	383	1.2	WATER CLEAR
1510	6.94	4.04	19.3	387	1.2	WATER CLEAR
1513	6.99	3.59	19.2	387	1.2	READY TO SAMPLE
1515	—	—	—	—	0.02	REDUCE FLOW; COLLECT
						MW-954-018'
1520	—	—	—	—	0.02	COLLECT MW-954-019
1525	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET AT 101' BGS

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0260
Date : 10/29/98
Site Engineer : J. BRENNER B. DOMINSK
Well Number : MW-13
Equipment : DRT. ISCE, YSI 3500, 2" GRUNDFOS REDI-FLO
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	188.68	TOP OF 4" CASING	188.68
Depth to Sediment (ft)	234.97	TOP OF 4" CASING	234.97
Thickness of Sediment (ft)	0.03		0.03

Depth of Well (ft): 235.0
Diameter of Casing (ft): 0.333
Water Column Height (ft): 46.29
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 30.15
Casing Volumes Purged: 1.9
Total Volume Purged (gals): 57.3

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0901	8.01	4.06	22.0	614	1.7	PUMP ON, CONTROL BOX
0906	7.11	4.87	22.0	593	1.7	SET AT 316 Hz
0911	7.11	4.89	22.1	595	1.7	WATER CLEAR
0916	7.14	4.98	22.0	576	1.7	WATER CLEAR
0921	7.15	3.93	22.1	580	1.7	WATER CLEAR
0926	7.12	3.08	22.3	577	1.7	WATER CLEAR
0931	7.11	3.47	22.2	581	1.7	WATER CLEAR
0936	7.10	3.43	22.4	580	1.7	READY TO SAMPLE
0935	—	—	—	—	0.02	FLOW RATE REDUCED, COLLECT MW-984-031
0945	—	—	—	—	0.02	COLLECT MW-984-032
0946	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET AT 194' BGS

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.026.0
Date : 11/13/99
Site Engineer : J. BEYNER, B. DUMESNIL
Well Number : MW-15
Equipment : YSI 3500
DIST-ISCE
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	28.77	TOP OF 4" CASING	28.77
Depth to Sediment (ft)	74.99	TOP OF 4" CASING	74.89
Thickness of Sediment (ft)	0.12		0.12

Depth of Well (ft) 75.0
Diameter of Casing (ft) 0.333
Water Column Height (ft) 46.11
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 30.0
Casing Volumes Purged 2.75
Total Volume Purged (gals) 82.5

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1130	6.47	9.2	18.1	461	3.3	PUMP ON, CONTROL BOX
						SET AT 200 Hz.
1135	6.71	5.32	18.7	463	3.3	WATER CLEAR
1140	6.68	3.13	17.9	460	3.3	WATER CLEAR
1145	6.80	3.09	17.2	466	3.3	WATER CLEAR
1150	6.81	2.84	17.9	462	3.3	WATER CLEAR
1153	6.99	2.01	17.8	460	3.3	READY TO SAMPLE
1155	—	—	—	—	0.02	FLOW REDUCED, COLLECT
						MW-99-038, 038MS, 038MSD
1200	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET AT 34' BGS

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0260
Date : 10/28/98
Site Engineer : S.BRENNER B.DUMENSIL
Well Number : MW-16
Equipment : IRT-15CE
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	241.75	TOP OF 4" CASING	241.75
Depth to Sediment (ft)	285.09	TOP OF 4" CASING	285.09
Thickness of Sediment (ft)	0		0

Depth of Well (ft) 285
Diameter of Casing (ft) 0.333
Water Column Height (ft) 43.25
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 28.2
Casing Volumes Purged 1.4
Total Volume Purged (gals) 40

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1105	7.31	1.20	22.8	566	1.6	PUMP ON, CONTROL BOX SET AT 350 Hz
1110	7.24	0.67	24.2	555	1.6	WATER CLEAR
1115	7.14	1.10	24.1	548	1.6	WATER CLEAR
1120	7.14	0.74	23.7	548	1.6	WATER CLEAR
1123	7.15	0.91	24.4	549	1.6	WATER CLEAR
1126	7.15	0.93	23.3	549	1.6	WATER CLEAR, READY TO SAMPLE
1130	—	—	—	—	0.2	REDUCE FLOW, COLLECT MW-984-039
1136	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET AT 248 FT BGS

F4

APPENDIX B

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

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0260
Date : 11/3/98
Site Engineer : J. BRANNER, B DUMESNIL

Well Number : MW-3
Equipment : DRT-15CE
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PIEZ. 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
0905	9.14	4.18	18.7	294	—	1ST RUN TO SCREEN #5; INITIAL PARAMETERS
0925	—	—	—	—	—	COLLECT MW-984-006
1005	9.05	4.16	18.9	291	—	2ND RUN TO SCREEN #5; FINAL PARAMETERS
1030	8.23	1.27	19.8	314	—	1ST RUN SCREEN #4, INITIAL PARAMETERS
1045	—	—	—	—	—	COLLECT MW-984-005-005MS-005MSD
1115	8.23	2.13	20.2	320	—	3RD RUN TO SCREEN #4; FINAL PARAMETERS
1145	8.26	3.34	19.5	383	—	1ST RUN TO SCREEN #3; INITIAL PARAMETERS
1200	—	—	—	—	—	COLLECT MW-984-004
1220	8.21	3.41	19.6	390	—	3RD TO SCREEN #3; FINAL PARAMETERS
1245	7.59	4.35	18.2	417	—	1ST RUN TO SCREEN #2, INITIAL PARAMETERS
1300	—	—	—	—	—	COLLECT MW-984-003
1315	7.50	3.95	18.6	424	—	3RD RUN TO SCREEN #2, FINAL PARAMETERS
1335	8.05	3.76	19.2	272	—	1ST RUN TO SCREEN #1; INITIAL PARAMETERS
1350	—	—	—	—	—	COLLECT MW-984-002
1415	7.71	3.84	18.3	271	—	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 : 1572.0260
Date : 10/27/98
Site Engineer : J. BIZENNER, B. DUMENSIL
Well Number : MW-4
Equipment : DIRT-15CE
YSI 3500
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
1130	7.16	3.39	20.9	673	—	1ST RUN TO SCREEN #2; INITIAL PARAMETERS
1145	—	—	—	—	—	2ND RUN COLLECT MW-98I-008
1200	—	—	—	—	—	COLLECT MW-98I-009
1250	7.09	3.61	20.0	672	—	FINAL RUN TO SCREEN #2; FINAL PARAMETERS

Notes Sampling Procedures: _____

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0260
Date : 10/30/98
Site Engineer : J. BIZZINER, B. DUMENSIL
Well Number : MW-4
Equipment : DRT-15CE
YSI-3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PIEZ. 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
0905	8.00	2.94	19.1	351	—	1ST RUN TO SCREEN #5; INITIAL PARAMETERS
0920	—	—	—	—	—	COLLECT MW-984-012
0955	7.91	2.12	19.3	354	—	3RD RUN TO SCREEN #5, FINAL PARAMETERS
1025	8.00	2.70	19.6	356	—	1ST RUN TO SCREEN # 4; INITIAL PARAMETERS
1040	—	—	—	—	—	COLLECT MW-984-011
1100	7.95	1.57	19.7	359	—	3RD RUN TO SCREEN #4; FINAL PARAMETERS
1125	8.17	1.24	20.1	394	—	1ST RUN TO SCREEN # 3; INITIAL PARAMETERS
1140	—	—	—	—	—	COLLECT MW-984-010, 010 MS, 010 MSD (INCL. VOA, MS/MSD, METALS)
1200	8.12	2.51	20.6	389	—	3RD RUN TO SCREEN # 3. FINAL PARAMETERS
1230	7.31	2.72	18.9	275	—	1ST RUN TO SCREEN #1; INITIAL PARAMETERS
1245	—	—	—	—	—	COLLECT MW-987-007
1300	7.15	1.78	18.9	200	—	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 : 1572.0260
Date : 10/27/98
Site Engineer : J. BLEYNAT

Well Number : MW-11
Equipment : DRT-15CE
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PIEZ. 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
1340	8.01	3.71	20.6	401	—	1ST RUN TO SCREEN #2; INITIAL PARAMETERS
1400	—	—	—	—	—	COLLECT MW-11-021-021MS-021MSD METALS
1425	7.891	3.15	21.0	410	—	3RD RUN TO SCREEN #2; FINAL PARAMETERS
1440	7.91	1.39	20.1	532	—	1ST RUN TO SCREEN #1; INITIAL PARAMETERS
1500	—	—	—	—	—	COLLECT MW-989-020
1525	7.72	0.94	19.2	475	—	3RD RUN TO SCREEN #1; FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0260
Date : 11/19/98
Site Engineer : J. BENNER, M. SHADAB

Well Number : MW-11
Equipment : YSI 3500
DIRT-ISCE
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PURGE 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	8.34	1.42	19.3	286	—	1ST RUN TO SCREEN #5; INITIAL PARAMETERS
0900	—	—	—	—	—	COLLECT MW-905-024
0930	8.14	1.89	21.4	304	—	2ND RUN TO SCREEN #5; FINAL PARAMETERS
1000	8.16	4.52	21.2	341	—	1ST RUN TO SCREEN #4; INITIAL PARAMETERS
1015	—	—	—	—	—	COLLECT MW-904-023
1050	8.25	3.51	21.7	366	—	2ND RUN TO SCREEN #4; FINAL PARAMETERS
1125	7.84	4.47	21.6	339	—	1ST RUN TO SCREEN #3; INITIAL PARAMETERS
1145	—	—	—	—	—	COLLECT MW-904-022
1210	8.05	2.78	21.3	307	—	2ND RUN TO SCREEN #3; FINAL PARAMETERS

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0260
Date : 11/5/98
Site Engineer : J. Brenner, B. Dimeglio
Well Number : MW-12
Equipment : DRT-15CE, YSI 3500
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
1500	7.33	4.86	18.6	429	—	1st Run to Screen #2. Initial Parameters
1510	—	—	—	—	—	Collect MW-984-0261027
1525	7.31	5.48	18.3	432	—	2nd Run to Screen #2 Final Parameters
1540	7.07	4.16	17.8	436	—	1st Run to Screen #3. Initial Parameters
1550	—	—	—	—	—	Collect MW-984-028
1615	7.80	9.87	17.9	438	—	2nd Run to Screen #3 Final Parameters

Notes Sampling Procedures: _____

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0260
Date : 11/9/98
Site Engineer : J. BREWER, B. DOHERTY

Well Number : MW-12
Equipment : YSI 3500
DRT-15CE
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
0855	7.70	[redacted] 128	17.4	370	—	1st Run to Screen #5 Initial Parameters
0920	—	—	—	—	—	2nd Run to Screen #5 collect MW-984-030
0950	7.83	3.90	17.5	369	—	3rd Run Final Parameters
1020	7.98	4.24	17.2	399	—	1st Run to Screen #4 Initial Parameters
1100	—	—	—	—	—	2nd Run to COLLECT SAMPLES MW-984-029
1110	7.92	3.39	17.6	403	—	3rd Run to Screen #4 Final Parameters
1130	7.75	67.2	17.7	324	—	1st Run to Screen #1 Initial Parameters
1155	7.67	58.4	17.8	323	—	2nd Run more Parameters High NTUs attempt to reduce turbidity
					—	
1425	7.40	11.2	17.6	326	—	1st Run after purging approx 10 gallons
1450	—	—	—	—	—	COLLECT MW-984-025
1515	7.23	23.4	16.8	318	—	3rd Run to Screen #4 Final Parameters

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0260
Date : 11/10/98
Site Engineer : J. BRENNER, B. DUMESNIL
Well Number : MW-14
Equipment : DRT-1SCE
YSI-3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PREV. PURGE 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	8.95	4.45	18.8	289	—	1ST RUN TO SCREEN #5; INITIAL PARAMETERS
0930	—	—	—	—	—	COLLECT MW-984-037
0955	8.55	4.10	18.6	296	—	3RD RUN TO SCREEN #5; FINAL PARAMETERS
1025	7.93	2.26	19.4	504	—	1ST RUN TO SCREEN #4; INITIAL PARAMETERS
1045	—	—	—	—	—	COLLECT MW-984-036 -036MS
1110	7.64	2.19	20.9	532	—	3RD RUN; FINAL PARAMETERS -036MSD
1150	7.69	0.84	19.6	857	—	1ST RUN TO SCREEN #3; INITIAL PARAMETERS
1200	—	—	—	—	—	COLLECT MW-984-035
1225	7.69	0.65	19.5	863	—	3RD RUN TO SCREEN #3; FINAL PARAMETERS
1250	7.65	4.27	22.3	1175	—	1ST RUN TO SCREEN #2; INITIAL PARAMETERS
1315	—	—	—	—	—	COLLECT MW-984-034
1330	7.22	3.23	22.2	1190	—	3RD RUN TO SCREEN #2; FINAL PARAMETERS
1355	5.61	4.19	22.1	1210	—	1ST RUN TO SCREEN #1; ~~FINAL~~ INITIAL PARAMETERS
1415	—	—	—	—	—	COLLECT MW-984-033
1430	5.72	3.24	22.2	1197	—	3RD RUN TO SCREEN #1; FINAL PARAMETERS

Notes Sampling Procedures: ____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0250
Date : 10/27/98
Site Engineer : J. BRANNAN, B. DUMENSIL

Well Number : MW-17
Equipment : DRT-1SCE
YSI-3500
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
0900	7.90	4.39	18.3	345	—	1ST RUN TO SCREEN #3, INITIAL PARAMETERS
0925	—	—	—	—	—	COLLECT MW-9X4-042
1030	7.76	3.10	19.8	353	—	FINAL RUN TO SCREEN #3, FINAL PARAMETERS

Notes Sampling Procedures:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0260
Date : 11/4/98
Site Engineer : J. BLENNER, B. DUMESNIL
Well Number : MW-17
Equipment : DIRT-ISCE
YSI-3500
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
0910	7.55	5.07	19.5	397	—	1ST RUN TO SCREEN # 5; INITIAL PARAMETERS
0930	—	—	—	—	—	COLLECT MW-984-094
1020	8.01	16.4	20.1	405	—	3RD RUN TO SCREEN #5; FINAL PARAMETERS
1100	7.51	1.81	19.8	396	—	1ST RUN TO SCREEN #4; INITIAL PARAMETERS
1110	—	—	—	—	—	COLLECT MW-984-093
1145	7.80	1.99	18.2	383	—	3RD TO SCREEN #4; FINAL PARAMETERS
1220	8.65	1.66	19.4	291	—	1ST RUN TO SCREEN # 2; INITIAL PARAMETERS
1240	—	—	—	—	—	COLLECT MW-984-091 -091MS -091MSD
1305	8.61	1.73	19.6	290	—	3RD RUN TO SCREEN #2; FINAL PARAMETERS
1335	7.35	0.46	17.6	267	—	1ST RUN TO SCREEN # 1; INITIAL PARAMETERS
1345	—	—	—	—	—	COLLECT MW-984-090
1425	7.11	1.09	16.9	252	—	FINAL RUN TO SCREEN #1; INITIAL PARAMETERS

Notes Sampling Procedures: ____

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0260
Date : 10/22/98
Site Engineer : J. BRENNER, B. DUMENSIL
Well Number : MW-10
Equipment : DT-15CE, YSI 3500
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
1000	8.92	2.75	19.0	272	—	1ST RUN TO SCREEN #5; INITIAL PARAMETERS
1015	—	—	—	—	—	COLLECT MW-984-049
1055	9.09	3.04	19.2	270	—	3RD RUN TO SCREEN #5, FINAL PARAMETERS
1115	8.05	4.61	19.1	350	—	1ST RUN TO SCREEN #4; INITIAL PARAMETERS
1130	—	—	—	—	—	COLLECT MW-984-045
1210	8.01	3.40	20.5	368	—	3RD RUN TO SCREEN #4; FINAL PARAMETERS
1245	8.07	1.74	19.4	429	—	1ST RUN TO SCREEN # 3; INITIAL PARAMETERS
1300	—	—	—	—	—	COLLECT MW-984-047
1320	8.02	2.89	20.2	441	—	3RD RUN TO SCREEN # 3, FINAL PARAMETERS
1345	7.51	1.94	20.4	399	—	1ST RUN TO SCREEN #2; INITIAL PARAMETERS
1405	—	—	—	—	—	COLLECT MW-984-046; INCLUDING MS/MSD FOR VOCS/METALS
1430	7.27	2.54	21.6	414	—	3RD RUN TO SCREEN # 2; FINAL PARAMETERS
1500	7.36	2.29	22.0	321	—	1ST RUN SCREEN #1; INITIAL PARAMETERS
1515	—	—	—	—	—	COLLECT MW-984-045
1545	7.10	2.50	22.9	330	—	3RD RUN, FINAL PARAMETERS

Notes Sampling Procedures: _____

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0260
Date : 10/23/98
Site Engineer : J. BRENNAN/B. DOMANSKI

Well Number : MW-19
Equipment : DRT. ISCE
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PIEZ. 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	7.94	2.45	18.6	710	—	1ST RUN TO SCREEN #5; INITIAL PARAMETERS
1010	—	—	—	—	—	COLLECT MW-984-054
1030	7.91	1.63	18.9	721	—	3RD RUN TO SCREEN #5; FINAL PARAMETERS
1105	7.74	1.54	19.2	435	—	1ST RUN TO SCREEN #4; INITIAL PARAMETERS
1130	—	—	—	—	—	COLLECT MW-984-053
1150	7.58	1.48	20.9	457	—	3RD RUN TO SCREEN #4; FINAL PARAMETERS
1230	7.28	3.40	20.4	804	—	1ST RUN TO SCREEN #3; INITIAL PARAMETERS
1250	—	—	—	—	—	COLLECT MW-984-052 MS/MSD METHOD MW-984-052MS; MW-984-052MSD
1310	7.09	3.50	22.0	855	—	3RD RUN TO SCREEN #3; FINAL PARAMETERS
1335	6.92	4.78	21.2	497	—	1ST RUN TO SCREEN #2; INITIAL PARAMETERS
1350	—	—	—	—	—	COLLECT MW-984-051
1410	6.97	9.76	21.4	496	—	3RD RUN TO SCREEN #2; FINAL PARAMETERS
1430	7.53	12.5	21.8	269	—	1ST RUN TO SCREEN #1; INITIAL PARAMETERS
1445	7.51	3.69	22.0	273	—	COLLECT MW-984-051
1510	7.33	9.78	21.8	262	—	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 : 1572.0260
Date : 11/2/98
Site Engineer : J. BRENNER, B. DAMES, LLC
Well Number : MW-20
Equipment : DRT-15CE
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PROJ. 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
0915	8.53	1.57	16.5	292	—	1ST RUN TO SCREEN # 5; INITIAL PARAMETERS
0945	—	—	—	—	—	COLLECT MW-984-059
1020	8.47	2.02	17.4	300	—	3RD RUN TO SCREEN # 5, FINAL PARAMETERS
1055	8.66	2.63	17.5	286	—	1ST RUN TO SCREEN #4; INITIAL PARAMETERS
1115	—	—	—	—	—	COLLECT MW-984-058
1150	8.70	3.69	18.1	291	—	3RD RUN TO SCREEN #4; FINAL PARAMETERS
1220	8.10	2.71	18.5	473	—	1ST RUN TO SCREEN # 3; INITIAL PARAMETERS
1240	—	—	—	—	—	COLLECT MW-984-057
1305	8.02	3.21	18.5	479	—	3RD RUN TO SCREEN # 3; FINAL PARAMETERS
1335	8.42	2.30	18.2	327	—	1ST RUN TO SCREEN # 2; INITIAL PARAMETERS
1350	—	—	—	—	—	COLLECT MW-984-056
1415	7.97	1.23	18.2	357	—	3RD RUN TO SCREEN # 2; FINAL PARAMETERS
1440	7.72	1.32	18.9	721	—	1ST RUN TO SCREEN # 1; INITIAL PARAMETERS
1455	—	—	—	—	—	COLLECT MW-984-055
1515	7.48	1.08	18.3	736	—	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 : 1572.0260
Date : 11/12/98
Site Engineer : J. BIZZINKER, B. DUMESNIL
Well Number : MW-21
Equipment : DR-15CE
YSI 3500
Contractor : NONE

	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
0930	7.97	16.1	16.7	718	—	1ST RUN TO SCREEN #5, INITIAL PARAMETERS
0945	7.78	32.9	16.1	700	—	2ND RUN, ATTEMPTING TO REDUCE TURBIDITY
						* WILL RERUN LATER *
1015	7.32	9.51	17.7	782	—	1ST RUN TO SCREEN #4, INITIAL PARAMETERS
1030	7.45	9.36	18.3	781	—	2ND RUN COLLECT MW-984-063, -063MS, 063MSD
1055	7.46	1.38	18.1	781	—	3RD RUN TO SCREEN #4, FINAL PARAMETERS
1115	7.37	4.79	18.3	940	—	1ST RUN TO SCREEN #3, INITIAL PARAMETERS
1130	—	—	—	—	—	COLLECT MW-984-062
1155	7.24	4.05	18.6	959	—	3RD RUN TO SCREEN #3, FINAL PARAMETERS
1215	7.98	3.52	19.4	1100	—	1ST RUN TO SCREEN #2, INITIAL PARAMETERS
1230	—	—	—	—	—	COLLECT MW-984-061
1240	7.41	3.71	19.4	1114	—	3RD RUN TO SCREEN #2, FINAL PARAMETERS
1300	~~6.09~~	2.20	19.5	767	—	1ST RUN TO SCREEN #1, INITIAL PARAMETERS
1315	—	—	—	—	—	COLLECT MW-984-060
1330	6.50	2.99	19.2	755	—	3RD RUN TO SCREEN #1, FINAL PARAMETERS
1415	7.62	14.1	19.6	740	—	1ST RUN TO SCREEN #5 AFTER PURGING 1 GALLON
1440	—	—	—	—	—	COLLECT MW-984-064
1500	7.55	17.6	19.5	741	—	3RD RUN TO SCREEN #5, FINAL PARAMETERS

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Well Number : MW-22
Project Number : 1572.0260
Equipment : DRT. ISCO YSI 3500
Date : 11/16/98
Site Engineer : J. BRENNER, B. DUMESNIL
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
0910	9.16	3.30	17.9	347	—	1ST RUN TO SCREEN #5; INITIAL PARAMETERS
0930	—	—	—	—	—	COLLECT MW.984-069
1000	9.22	2.24	17.9	342	—	3RD RUN TO SCREEN #5, FINAL PARAMETERS
1055	8.05	4.34	18.7	323	—	1ST RUN TO SCREEN #4, INITIAL PARAMETERS
1115	—	—	—	—	—	COLLECT MW.984-068
1135	7.89	4.51	18.9	323	—	3RD RUN TO SCREEN #4; PARAMETERS, FINAL
1200	8.15	3.54	19.3	449	—	1ST RUN TO SCREEN #3, INITIAL PARAMETERS
1220	—	—	—	—	—	COLLECT MW.984-067, -067MS, -067MSD
	~~8.04~~		~~19.1~~	~~451~~	-	
1245	8.04	3.62	19.1	451	—	3RD RUN TO SCREEN #3, FINAL PARAMETERS
1315	7.99	4.13	19.3	623	—	1ST RUN TO SCREEN #2, INITIAL PARAMETERS
1330	—	—	—	—	—	COLLECT MW.984-066
1415	7.82	4.47	20.2	646	—	3RD RUN TO SCREEN #2; INITIAL PARAMETERS
1420	7.29	3.97	19.8	941	—	1ST RUN TO SCREEN #1, INITIAL PARAMETERS
1500	—	—	—	—	—	COLLECT MW.984-065
1520	7.24	11.07	19.0	942	—	3RD RUN TO SCREEN #1, FINAL PARAMETERS

Notes Sampling Procedures:

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0260
Date : 11/19/98
Site Engineer : J. BROWNE, M. SCHNEIDER

Well Number : MW-23
Equipment : DRT-15CE
YSI 3500
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
0950	9.50	2.48	10.6	527	—	1ST RUN TO SCREEN # 5; INITIAL PARAMETERS
1015	—	—	—	—	—	COLLECT MW 984-074
1040	9.60	3.06	18.4	516	—	3RD RUN TO SCREEN # 5; FINAL PARAMETERS
1105	8.10	4.21	19.6	333	—	1ST RUN TO SCREEN # 4; INITIAL PARAMETERS
1125	—	—	—	—	—	COLLECT MW-984-073
1150	7.80	7.23	19.7	331	—	3RD RUN TO SCREEN #4; FINAL PARAMETERS
1220	7.54	4.48	19.3	407	—	1ST RUN TO SCREEN # 3; INITIAL PARAMETERS
1230	—	—	—	—	—	COLLECT MW-984-072 (MS/MSD)
						-072MS-072MSD
1300	7.69	5.34	19.5	411	—	3RD RUN TO SCREEN # 3; FINAL PARAMETERS
1325	7.38	4.09	19.6	937	—	1ST RUN TO SCREEN # 2; INITIAL PARAMETERS
1345	—	—	—	—	—	COLLECT MW-984-071
1400	7.12	2.56	19.3	954	—	3RD RUN TO SCREEN # 2; FINAL PARAMETERS
1425	7.20	6.34	19.0	580	—	1ST RUN TO SCREEN # 1; INITIAL PARAMETERS
1600	—	—	—	—	—	COLLECT MW-984-070
1630	7.31	11.42	19.2	576	—	3RD RUN TO SCREEN #3 FINAL PARAMETERS

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0260
Date : 10/26/98
Site Engineer : J. BRENNER B DUMENSIL
Well Number : MW-24
Equipment : YSI 3500
DRT-1500
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
0925	7.77	70.1	19.8	402	—	1ST RUN TO SCREEN #3, INITIAL PARAMETERS
0950	7.76	33.4	19.7	410	—	2ND RUN, REDUCING TURBIDITY
1009	7.95	23.2	19.8	417	—	3RD RUN, REDUCING TURBIDITY
1030	7.84	13.4	20.4	419	—	4TH RUN, REDUCING TURBIDITY
1055	7.80	26.7	20.7	421	—	5TH RUN, WILL RETURN LATER
1115	8.20	18.2	20.5	357	—	1ST RUN TO SCREEN #2, INITIAL PARAMETERS
1135	8.36	18.1	21.2	362	—	2ND RUN, REDUCING TURBIDITY
1200	8.34	27.1	21.3	363	—	WILL RETURN LATER
1220	7.74	3.82	21.0	373	—	1ST RUN TO SCREEN #1, INITIAL PARAMETERS
1240	—	—	—	—	—	COLLECT MW-984-075
1340	7.49	6.10	21.6	377	—	FINAL RUN TO SCREEN #1, FINAL PARAMETERS
1505	7.60	20.0	22.3	426	—	1ST RUN TO SCREEN #3 AFTER PURGING 2.1 GALS
1610	8.31	18.2	21.2	368	—	1ST RUN TO SCREEN #2 AFTER PURGING 0.5 GALS

Notes Sampling Procedures: ____

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPC
Project Number : 15720260
Date : 10/29/98
Site Engineer : J. BRENNAC; B. DIMENSIC
Well Number : MW-24
Equipment : DRT-15CE
YSI 3500
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
1140	7.91	4.80	21.2	417	—	1ST RUN TO SCREEN # 5; INITIAL PARAMETERS
1200	—	—	—	—	—	COLLECT MW-984-077
1225	7.80	7.94	21.1	433	—	3RD RUN TO SCREEN #5; FINAL PARAMETERS
1250	8.30	5.03	22.4	394	—	1ST RUN TO SCREEN #2, INITIAL PARAMETERS
1305	—	—	—	—	—	COLLECT MW-984-076
1330	8.32	15.6	22.6	384	—	3RD RUN TO SCREEN #2; FINAL PARAMETERS
1405	8.00	4.73	20.6	373	—	1ST RUN TO SCREEN # 5; INITIAL PARAMETERS
1415	—	—	—	—	—	COLLECT MW-984-079
1455	7.92	3.90	20.1	373	—	3RD RUN TO SCREEN #5; FINAL PARAMETERS
1525	8.30	4.91	20.2	358	—	1ST RUN TO SCREEN #4; INITIAL PARAMETERS
1545	—	—	—	—	—	COLLECT MW-984-078
1610	8.32	3.97	19.9	336	—	3RD RUN TO SCREEN #4; FINAL PARAMETERS

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/19-20/98 | 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: 75 degrees, Sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Blaney

Ambient Reading (Pressure/Temperature/Time) Start: 14.17/19.77/1018 | Finish: 14.37/19.63/1032

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	161.15			22.79	1021		231.86	868.48
			196.88						
			196.86						
			196.88						
				161.13					
4	558	119.79			21.63	1023		193.04	907.30
			172.52						
			172.50						
			172.54						
				119.81					
3	346	28.02			20.67	1025		123.51	976.83
			110.77						
			110.74						
			110.77						
				28.04					
2	252	14.50			20.43	1027		119.27	981.07
			71.86						
			71.84						
			71.84						
				14.48					
1	172	14.41			19.79	1029		110.42	989.92
			41.00						
			41.02						
			40.99						
				14.39					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/19-20/98 | Job No.: 1572

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

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

Weather: 75 degrees, Sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Blaney

Ambient Reading (Pressure/Temperature/Time) Start: 14.26/22.20/1439 | Finish: 14.26/19.93/1500

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	513	125.68			22.22	1446		185.14	897.70
			156.38						
			156.40						
			156.38						
				125.70					
4	392	73.10			22.29	1449		112.39	970.45
			135.46						
			135.49						
			135.46						
				73.10					
3	322	42.74			21.89	1451		103.71	979.13
			108.91						
			108.88						
			108.88						
				42.77					
2	240	14.32			21.16	1453		100.44	982.40
			74.74						
			74.77						
			74.77						
				14.27					
1	150	14.28			20.12	1455		86.49	996.35
			41.80						
			41.77						
			41.80						
				14.29					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/19-20/98 | 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: 75 degrees, Sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Blaney

Ambient Reading (Pressure/Temperature/Time) Start: 14.35/23.23/1611 | Finish: 14.30/18.64/1658

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	157.37			21.20	1642		227.02	912.28
			192.92						
			192.92						
			192.92						
				157.40					
4	524	107.86			21.45	1644		170.42	968.88
			167.60						
			167.63						
			167.58						
				107.84					
3	429	67.05			19.80	1650		161.22	978.08
			130.41						
			130.39						
			130.42						
				67.08					
2	259	14.34			19.19	1653		145.71	993.59
			63.46						
			63.42						
			63.43						
				14.31					
1	149	14.25			18.73	1655		115.50	1023.80
			28.84						
			28.87						
			28.83						
				14.26					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/19-20/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1102.14 | Range: 0 to 750 psia | Weather: 75 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner, T. Blaney

Ambient Reading (Pressure/Temperature/Time) Start: 14.23/20.95/1504 | Finish: 14.25/18.58/1610

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	548	174.76			21.02	1513		191.70	910.44
			168.70						
			168.67						
			168.72						
				174.78					
4	436	125.85			22.03	1555		133.65	968.49
			145.30						
			145.32						
			145.30						
				125.83					
3	323	76.82			20.64	1601		120.28	981.86
			102.11						
			102.14						
			102.11						
				76.80					
2	243	42.05			19.55	1603		116.58	985.56
			69.05						
			69.03						
			69.05						
				42.10					
1	140	14.28			18.76	1605		101.11	1001.03
			31.11						
			31.09						
			31.09						
				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: 10/19-20/98 | 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: 75 degrees, Sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Blaney

Ambient Reading (Pressure/Temperature/Time) Start: 14.32/24.54/1340 | Finish: 14.27/19.88/1357

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	151.58			21.87	1346		173.50	999.97
			173.18						
			173.16						
			173.18						
				151.61					
4	456	115.09			21.84	1348		172.57	1000.90
			137.15						
			137.17						
			137.17						
				115.05					
3	382	82.93			21.12	1350		172.58	1000.89
			105.07						
			105.10						
			105.07						
				82.91					
2	277	37.26			20.32	1352		172.36	1001.11
			59.67						
			59.65						
			59.65						
				37.23					
1	207	14.22			19.95	1354		171.59	1001.88
			29.64						
			29.62						
			29.67						
				14.29					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/19-20/98 | Job No.: 1572

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

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

Weather: 75 degrees, Sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Blaney

Ambient Reading (Pressure/Temperature/Time) Start: 14.14/17.71/0815 | Finish: 14.14/15.94/0830

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	171.45			18.92	820		296.87	894.34
			200.15						
			200.18						
			200.18						
				171.49					
4	582	109.19			18.57	822		287.43	903.78
			141.83						
			141.85						
			141.83						
				109.21					
3	468	59.89			17.54	824		229.68	961.53
			117.45						
			117.47						
			117.44						
				59.90					
2	370	17.68			16.38	826		216.68	974.53
			80.59						
			80.61						
			80.61						
				17.70					
1	250	14.29			16.07	828		200.42	990.79
			35.63						
			35.66						
			35.61						
				14.26					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/19-20/98 | Job No.: 1572

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

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

Weather: 75 degrees, Sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Blaney

Ambient Reading (Pressure/Temperature/Time) Start: 14.21/16.54/0840 | Finish: 14.19/17.39/0852

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	148.86			20.16	842		301.35	924.06
			180.08						
			180.06						
			180.09						
				148.88					
4	564	96.74			20.65	844		284.36	941.05
			135.41						
			135.43						
			135.43						
				96.69					
3	424	35.91			20.23	846		251.34	974.07
			89.04						
			89.06						
			89.04						
				35.94					
2	330	14.25			18.05	848		246.21	979.20
			50.50						
			50.55						
			50.52						
				14.28					
1	270	14.26			17.48	850		244.86	980.55
			25.09						
			25.12						
			25.09						
				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: 10/19-20/98 | Job No.: 1572

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

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

Weather: 75 degrees, Sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Blaney

Ambient Reading (Pressure/Temperature/Time) Start: 14.20/18.96/0942 | Finish: 14.27/19.04/0958

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	84.59			18.95	945		293.83	849.11
			102.76						
			102.71						
			102.76						
				84.61					
4	444	61.12			18.18	947		290.20	852.74
			80.90						
			80.92						
			80.90						
				61.14					
3	392	38.58			18.20	950		187.26	955.68
			103.02						
			102.97						
			102.98						
				38.54					
2	314	14.21			20.17	952		180.20	962.74
			72.23						
			72.25						
			72.23						
				14.22					
1	242	14.20			19.32	955		163.35	979.59
			48.32						
			48.35						
			48.32						
				14.21					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/19-20/98 | Job No.: 1572

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

Elevation of datum(ft msl): 1165.05 | Range: 0 to 750 psia | Weather: 75 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner, T. Blaney

Ambient Reading (Pressure/Temperature/Time) Start: 14.18/18.66/0905 | Finish: 14.16/18.42/0920

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	265.33			22.41	909		201.50	963.55
			316.95						
			316.98						
			316.98						
				265.32					
4	700	178.40			22.65	911		236.43	928.62
			215.12						
			215.14						
			215.12						
				178.38					
3	562	118.39			21.76	913		220.75	944.30
			162.10						
			162.08						
			162.12						
				118.40					
2	392	44.50			20.55	915		202.76	962.29
			96.20						
			96.22						
			96.20						
				44.49					
1	230	14.22			18.89	917		202.64	962.41
			26.04						
			26.01						
			26.04						
				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: 10/19-20/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1059.10 | Range: 0 to 750 psia | Weather: 75 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner, T. Blaney

Ambient Reading (Pressure/Temperature/Time) Start: 14.52/22.91/1305 | Finish: 14.27/19.39/1323

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	131.64			20.88	1312		64.26	994.84
			147.81						
			147.78						
			147.81						
				131.67					
4	310	104.68			20.59	1314		64.04	995.06
			121.03						
			121.01						
			121.01						
				104.68					
3	240	74.72			20.15	1316		62.72	996.38
			91.24						
			91.26						
			91.24						
				74.73					
2	161	40.41			19.62	1319		62.05	997.05
			57.28						
			57.31						
			57.28						
				40.39					
1	90	14.29			19.40	1321		62.38	996.72
			26.35						
			26.38						
			26.38						
				14.27					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/19-20/98 | 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: 75 degrees, Sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Blaney

Ambient Reading (Pressure/Temperature/Time) Start: 14.45/24.35/1740 | Finish: 14.53/20.52/1800

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	166.36			22.89	1746		213.94	963.04
			176.64						
			176.66						
			176.64						
				166.41					
4	467	113.87			22.56	1748		202.22	974.76
			129.28						
			129.25						
			129.28						
				113.90					
3	389	79.99			22.02	1750		183.86	993.12
			103.41						
			103.43						
			103.41						
				80.02					
2	329	53.93			21.29	1752		183.94	993.04
			77.38						
			77.36						
			77.38						
				53.93					
1	245	17.04			20.63	1754		181.03	995.95
			42.21						
			42.24						
			42.21						
				17.07					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/19-20/98 | Job No.: 1572

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

Elevation of datum(ft msl): 1108.84 | Range: 0 to 750 psia | Weather: 75 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner, T. Blaney

Ambient Reading (Pressure/Temperature/Time) Start: 14.30/23.89/1410 | Finish: 14.29/20.28/1431

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	185.71			22.11	1418		142.71	966.13
			187.38						
			187.38						
			187.40						
				185.72					
4	445	143.71			22.19	1420		141.14	967.70
			146.01						
			146.03						
			146.01						
3	319	89.18		143.68	21.35	1422		119.95	988.89
			100.57						
			100.58						
			100.60						
				89.16					
2	254	61.02			20.92	1427		119.22	989.62
			72.74						
			72.72						
			72.71						
				61.06					
1	174	26.37			20.46	1429		113.78	995.06
			40.41						
			40.38						
			40.41						
				26.41					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 10/19-20/98 | 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: 75 degrees, Sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Blaney

Ambient Reading (Pressure/Temperature/Time) Start: 14.28/20.70/1705 | Finish: 14.41/20.60/1730

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	187.55			22.21	1715		261.63	939.31
			194.82						
			194.87						
			194.84						
				187.54					
4	554	133.90			21.61	1718		241.85	959.09
			149.67						
			149.65						
			149.67						
				133.92					
3	435	82.29			22.00	1720		215.97	984.97
			109.30						
			109.28						
			109.30						
				82.29					
2	373	55.39			21.91	1722		212.55	988.39
			83.88						
			83.91						
			83.91						
				55.37					
1	279	14.62			21.03	1724		204.61	996.33
			46.60						
			46.58						
			46.60						
				14.60					

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: 11/20/98 | 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: 75 degrees, Sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner

Ambient Reading (Pressure/Temperature/Time) Start: 14.33/18.31/0945 | Finish: 14.29/21.59/1020

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	161.63			22.32	950		233.49	866.85
			196.19						
			196.14						
			196.17						
				161.70					
4	558	120.21			22.90	953		207.93	892.41
			166.07						
			166.09						
			166.04						
				120.23					
3	346	28.25			22.16	956		127.10	973.24
			109.20						
			109.18						
			109.23						
				28.28					
2	252	14.35			20.27	959		122.62	977.72
			70.42						
			70.40						
			70.37						
				14.36					
1	172	14.41			21.96	1010		114.02	986.32
			39.47						
			39.44						
			39.42						
				14.39					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 11/20/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1082.84 | Range: 0 to 750 psia | Weather: 75 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner

Ambient Reading (Pressure/Temperature/Time) Start: 14.34/21.67/1105 | Finish: 14.32/19.90/1121

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	125.71			22.00	1109		195.80	887.04
			151.83						
			151.85						
			151.83						
				125.70					
4	392	73.15			22.32	1112		115.60	967.24
			134.17						
			134.14						
			134.14						
				73.13					
3	322	42.71			21.89	1114		105.95	976.89
			108.00						
			107.98						
			107.98						
				42.74					
2	240	14.42			21.16	1116		102.83	980.01
			73.79						
			73.77						
			73.82						
				14.39					
1	150	14.41			20.62	1119		89.96	992.88
			40.36						
			40.33						
			40.38						
				14.38					

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: 11/20/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1139.30 | Range: 0 to 750 psia | Weather: 75 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner

Ambient Reading (Pressure/Temperature/Time) Start: 14.38/21.05/1200 | Finish: 14.25/18.20/1225

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	639	158.23			21.36	1204		234.34	904.96
			189.77						
			189.72						
			189.71						
				158.33					
4	524	108.84			21.10	1206		172.22	967.08
			166.72						
			166.99						
			166.72						
				108.81					
3	429	67.98			20.19	1210		163.41	975.89
			129.44						
			129.46						
			129.44						
				67.97					
2	259	14.44			19.30	1215		147.81	991.49
			62.51						
			62.53						
			62.51						
				14.47					
1	149	14.37			18.41	1218		115.66	1023.64
			28.77						
			28.79						
			28.75						
				14.37					

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: 11/20/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1102.14 | Range: 0 to 750 psia | Weather: 75 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner

Ambient Reading (Pressure/Temperature/Time) Start: 14.28/22.36/1030 | Finish: 14.33/17.85/1050

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	189.43			21.66	1037		200.85	901.29
			164.81						
			164.79						
			164.79						
				189.43					
4	436	140.77			21.15	1039		136.78	965.36
			144.02						
			144.02						
			144.01						
				140.74					
3	323	91.63			20.21	1041		122.53	979.61
			101.18						
			101.23						
			101.21						
				91.58					
2	243	56.83			19.30	1043		119.00	983.14
			68.05						
			68.05						
			68.08						
				56.80					
1	140	14.40			18.08	1045		105.42	996.72
			29.29						
			29.31						
			29.29						
				14.38					

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: 11/20/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1173.47 | Range: 0 to 750 psia | Weather: 75 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner

Ambient Reading (Pressure/Temperature/Time) Start: 14.33/22.70/1345 | Finish: 14.29/20.04/1359

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	151.21			22.03	1347		173.40	1000.07
			173.23						
			173.23						
			173.23						
				151.21					
4	456	114.63			21.39	1350		172.59	1000.88
			137.17						
			137.19						
			137.15						
				114.63					
3	382	82.42			20.82	1352		172.68	1000.79
			105.05						
			105.07						
			105.03						
				82.42					
2	277	36.79			20.61	1354		172.46	1001.01
			59.63						
			59.65						
			59.61						
				36.79					
1	207	14.34			20.55	1356		171.87	1001.60
			29.54						
			29.56						
			29.52						
				14.34					

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: 11/20/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1191.21 | Range: 0 to 750 psia | Weather: 75 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner

Ambient Reading (Pressure/Temperature/Time) Start: 14.31/18.92/0730 | Finish: 14.36/15.61/0748

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	172.04			16.28	737		298.58	892.63
			199.61						
			199.64						
			199.62						
				172.03					
4	582	109.55			17.68	739		288.60	902.61
			141.53						
			141.51						
			141.53						
				106.61					
3	468	59.92			16.86	741		230.67	960.54
			117.21						
			117.23						
			117.21						
				59.91					
2	370	17.26			16.24	743		218.67	972.54
			79.95						
			79.93						
			79.93						
				17.29					
1	250	14.41			15.79	745		205.64	985.57
			33.58						
			33.56						
			33.56						
				14.38					

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: 11/20/98 | Job No.: 1572

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

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

Weather: 75 degrees, Sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner

Ambient Reading (Pressure/Temperature/Time) Start: 14.38/16.16/0805 | Finish: 14.16/17.14/0825

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	148.66			20.67	811		300.56	924.85
			180.48						
			180.51						
			180.49						
				148.68					
4	564	96.57			20.83	813		284.85	940.56
			135.26						
			135.29						
			135.29						
				96.59					
3	424	35.72			19.40	815		253.45	971.96
			88.21						
			88.19						
			88.21						
				35.70					
2	330	14.35			17.61	817		249.68	975.73
			49.10						
			49.08						
			49.08						
				14.37					
1	270	14.26			17.34	819		248.79	976.62
			23.46						
			23.48						
			23.46						
				14.26					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 11/20/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1142.94 | Range: 0 to 750 psia | Weather: 75 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner

Ambient Reading (Pressure/Temperature/Time) Start: 14.48/17.39/0910 | Finish: 14.28/17.74/0930

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	84.65			17.89	917		298.83	844.11
			100.70						
			100.73						
			100.73						
				84.63					
4	444	61.19			17.85	919		295.06	847.88
			78.96						
			78.94						
			78.94						
				61.16					
3	392	38.63			17.89	921		188.38	954.56
			102.63						
			102.66						
			102.66						
				38.61					
2	314	14.43			18.04	923		180.87	962.07
			72.10						
			72.08						
			72.10						
				14.43					
1	242	14.40			17.88	925		165.61	977.33
			47.49						
			47.52						
			47.47						
				14.35					

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: 11/20/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1165.05 | Range: 0 to 750 psia | Weather: 75 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner

Ambient Reading (Pressure/Temperature/Time) Start: 14.28/17.50/0840 | Finish: 14.21/17.66/0859

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	264.90			21.45	845		202.06	962.99
			316.82						
			316.78						
			316.80						
				264.89					
4	700	177.91			22.39	848		231.30	933.75
			217.44						
			217.42						
			217.42						
				177.94					
3	562	117.96			21.50	850		217.00	948.05
			163.79						
			163.81						
			163.81						
				117.98					
2	392	44.10			19.54	853		202.39	962.66
			96.44						
			96.42						
			96.46						
				44.12					
1	230	14.33			17.92	855		201.55	963.50
			26.58						
			26.55						
			26.60						
				14.41					

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: 11/20/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1059.10 | Range: 0 to 750 psia | Weather: 75 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner

Ambient Reading (Pressure/Temperature/Time) Start: 14.36/23.46/1410 | Finish: 14.39/19.66/1420

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	136.47			22.06	1412		65.48	993.62
			147.28						
			147.28						
			147.20						
				136.47					
4	310	109.52			21.42	1414		65.41	993.69
			120.42						
			120.40						
			120.40						
				109.52					
3	240	79.49			20.28	1416		64.09	995.01
			90.63						
			90.63						
			90.63						
				79.49					
2	161	45.15			19.97	1417		63.48	995.62
			56.65						
			56.67						
			56.63						
				45.15					
1	90	14.34			19.69	1418		63.95	995.15
			25.67						
			25.64						
			25.69						
				14.34					

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: 11/20/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1176.98 | Range: 0 to 750 psia | Weather: 75 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner

Ambient Reading (Pressure/Temperature/Time) Start: 14.21/23.70/1307 | Finish: 14.29/20.44/1335

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	164.62			21.60	1315		214.47	962.51
			176.17						
			176.19						
			176.17						
				164.62					
4	467	112.01			22.54	1317		202.72	974.26
			128.81						
			128.83						
			128.80						
				112.01					
3	389	78.14			21.93	1321		184.27	992.71
			103.00						
			103.00						
			103.00						
				78.14					
2	329	52.14			21.45	1328		184.27	992.71
			76.99						
			76.99						
			76.99						
				52.14					
1	245	15.21			20.71	1332		182.53	994.45
			41.33						
			41.33						
			41.33						
				15.21					

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: 11/20/98 | Job No.: 1572

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

Elevation of datum(ft msl): 1108.84 | Range: 0 to 750 psia | Weather: 75 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner

Ambient Reading (Pressure/Temperature/Time) Start: 14.39/21.09/1135 | Finish: 14.36/20.22/1155

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	188.72			21.58	1141		145.07	963.77
			186.42						
			186.44						
			186.47						
				188.79					
4	445	146.76			21.71	1144		144.67	964.17
			144.56						
			144.58						
			144.56						
				146.69					
3	319	92.19			21.49	1147		121.64	987.20
			99.91						
			99.94						
			99.94						
				92.17					
2	254	63.97			21.05	1151		121.09	987.75
			72.01						
			71.98						
			71.98						
				63.95					
1	174	29.39			20.59	1153		115.96	992.88
			39.53						
			39.55						
			39.53						
				29.42					

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: 11/20/98 | Job No.: 1572

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

Elevation of atum(ft msl): 1200.94 | Range: 0 to 750 psia | Weather: 75 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner

Ambient Reading (Pressure/Temperature/Time) Start: 14.27/19.50/1230 | Finish: 14.22/21.51/1250

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	678	185.53			21.33	1234		266.50	934.44
			192.63						
			192.60						
			192.66						
				185.53					
4	554	131.65			21.95	1236		242.84	958.10
			149.13						
			149.11						
			149.16						
				131.67					
3	435	80.00			21.92	1238		217.25	983.69
			108.64						
			108.66						
			108.62						
				79.99					
2	373	53.07			21.85	1240		214.17	986.77
			83.10						
			83.07						
			83.12						
				53.06					
1	279	14.39				1241		207.65	993.29
			45.16						
			45.18						
			45.18						
				14.41					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 172 Date: 11/3/98

Well Name: MW-3 Sampling Zone No.: 1 Starting Time: 1320 Finishing Time: 1415

Technicians: J. BRENNERS, B DOMESNIL

Water Level Inside MP Casing (Beginning of Session) 14.51 (PS.A) (End of Session) 14.52 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	✓	✓	✓	✓	✓	✓	14.51	✓	1325	1330	✓	14.50	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 3.76
2	✓	✓	✓	✓	✓	✓	14.52	✓	1343	1348	✓	14.51	1.0	2ND RUN; COLLECT MW-984-002; 2 VOA'S, METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	14.52	✓	1404	1408	✓	14.52	1.0	3RD RUN; HEX. CR, PERCHLORATE; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 40.26 PS.A

Total Volume: 3.0 L[F2]

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 252 Date: 11/3/98

Well Name: MW-3 Sampling Zone No.: 2 Starting Time: 1225 Finishing Time: 1315.

Technicians J. BRENNER, B. DUMESNIL

Water Level Inside MP Casing (Beginning of Session) 14.50 (PSIA) (End of Session) 14.50 PSIA

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	14.50	✓	1235	1230	✓	14.52	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 4.35
2	✓	✓	✓	✓	✓	✓	14.52	✓	1252	1255	✓	14.51	1.0	2ND RUN, COLLECT FW-989-003 2 VOAS METALS ANIONS, HEX Cr.
3	✓	✓	✓	✓	✓	✓	14.54	✓	1307	1309	✓	14.50	0.5	3RD RUN; PERCHLORATE; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 70.86 PSIA

Total Volume: 2.5 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 346 Date: 11/3/98

Well Name: MW-3 Sampling Zone No.: 3 Starting Time: 1120 Finishing Time: 1220

Technicians J. BRENNAN, B. DOMESNIC

Water Level Inside MP Casing (Beginning of Session) 29.80 (PSIA) (End of Session) 28.88 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	✓	✓	✓	✓	✓	✓	29.80	✓	1132	1134	✓	29.81	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 3.34
2	✓	✓	✓	✓	✓	✓	29.91	✓	1155	1158	✓	29.80	1.0	2ND RUN; COLLECT MW-9841-004; 2 VOAS, METALS, ANIONS, HEX.C.
3	✓	✓	✓	✓	✓	✓	29.75	✓	1215	1217	✓	29.83	0.5	3RD RUN; DUPLICATE; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS OUTSIDE MP CASING = 109.67 PSIA

Total Volume: 2.5 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 555 Date: 11/8/95

Well Name: MW-3 Sampling Zone No.: 4 Starting Time: 1010 Finishing Time: 1115

Technicians J. BRENNER, B. DOMBROWSKI

Water Level Inside MP Casing (Beginning of Session) 121.92 PSIA (End of Session) 121.89 PSIG

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	✓	✓	✓	✓	✓	✓	121.92	✓	1014	1016	✓	121.87	1.0	1ST RUN, INITIAL PARAMETERS; NTU'S = 1.27
2	✓	✓	✓	✓	✓	✓	121.87	✓	1039	1041	✓	122.01	1.0	2ND RUN, COLLECT MW-994-005 6 VOAS, METALS, ANIONS (1/2)
3	✓	✓	✓	✓	✓	✓	121.97	✓	1107	1109	✓	121.89	1.0	3RD RUN, 1/2 ANIONS, HEX. Cr, Cl04, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 166.24 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-3 Depth: 653 Date: 11/3/95

Well Name: MW-3 Sampling Zone No.: 5 Starting Time: 0830 Finishing Time: 1005

Technicians J. BRENNER, B. DUMESNIL

Water Level Inside MP Casing (Beginning of Session) 163.30 (PSIA) (End of Session) 162.18 (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	✓	✓	✓	✓	✓	✓	163.30	✓	0849	0851	✓	163.31	1.0	1ST RUN, INITIALS PARAMETERS; NTUS = 4.18
2	✓	✓	✓	✓	✓	✓	163.25	✓	0916	0918	✓	163.30	1.0	2ND; COLLECT MW-SE9-006; 2 VOAS, METALS, ANIONS, HEX. Cr
3	✓	✓	✓	✓	✓	✓	162.15	✓	0944	0946	✓	162.18	0.5	3RD; CLO4; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 196.02 PSIA

Total Volume: 2.5 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 150 Date: 10/30/98

Well Name: MW-4 Sampling Zone No.: 1 Starting Time: 1210 Finishing Time: 1300

Technicians J. BRENNER, B. DIMENSIL

Water Level Inside MP Casing (Beginning of Session) 14.32 (PSIA) (End of Session) 14.35 (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	✓	✓	✓	✓	✓	✓	14.32	✓	1216	1220	✓	14.30	1.0	1ST RUN; INITIAL PARAMETERS NTU'S = 2.72
2	✓	✓	✓	✓	✓	✓	14.35	✓	1234	1239	✓	14.33	1.0	2ND RUN; COLLECT MW-9184-007; 2 VOAS METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	14.40	✓	1251	1255	✓	14.35	0.5	3RD RUN; HEX. Cr, DUP, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 41.29 PSIA

Total Volume: 2.5

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 240 Date: 10/27/95

Well Name: MW-4 Sampling Zone No.: 2 Starting Time: 1110 Finishing Time: 1250

Technicians: J. BRENNER, B. DUMENIL

Water Level Inside MP Casing (Beginning of Session) 14.51 (PS.A) (End of Session) 14.64 (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	✓	✓	✓	✓	✓	✓	14.51	✓	1117	1121	✓	14.60	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 3.39
2	✓	✓	✓	✓	✓	✓	14.62	✓	1137	1140	✓	14.68	1.0	2ND, COLLECT MW-954-009; MW-954-006; 4 VOAS, 4-DIOXANE
3	✓	✓	✓	✓	✓	✓	14.59	✓	1156	1200	✓	14.63	1.0	3RD RUN; NOMA (3/4)
4	✓	✓	✓	✓	✓	✓	14.53	✓	1212	1215	✓	14.62	1.0	4TH RUN; (1/4) NOMA, 2 METALS, ~~4 CYANIDES~~
5	✓	✓	✓	✓	✓	✓	14.60	✓	1229	1233	✓	14.64	1.0	5TH RUN; ANIONS; 4 HEX CR; KClO4; ~~FINAL PARAMETERS~~
6	✓	✓	✓	✓	✓	✓	14.62	✓	1246	1249	✓	14.64	0.5	6TH RUN; KClO4; FINAL PARAMETERS
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 74.25 PSIA

Total Volume: 5.5L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 322 Date: 10/30/98

Well Name: MW-4 Sampling Zone No.: 3 Starting Time: 1105 Finishing Time: 1200

Technicians J. BRAINER, B. DUMENSIL

Water Level Inside MP Casing (Beginning of Session) 44.67 (PS.A) (End of Session) 44.62 (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	✓	✓	✓	✓	✓	✓	44.67	✓	1113	1116	✓	44.65	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 1.24
2	✓	✓	✓	✓	✓	✓	44.64	✓	1133	1136	✓	44.65	1.0	2ND RUN; COLLECT MW-4[illegible]010 6 VOAS, METALS, ANIONS (1/4) 010 MS DUPLICATE
3	✓	✓	✓	✓	✓	✓	44.62	✓	1154	1157	✓	44.62	1.0	3RD RUN; 3/4 ANIONS, HEX CR., C104; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 108.10 PS.A

Total Volume: 3.0 L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 392 Date: 10/30/98

Well Name: MW-4 Sampling Zone No.: 4 Starting Time: 1000 Finishing Time: 1100

Technicians: J. Brenner, B. Dimensic

Water Level Inside MP Casing (Beginning of Session) 75.16 (PSIA) (End of Session) 74.11 (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	✓	✓	✓	✓	✓	✓	75.16	✓	1009	1011	✓	75.13	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 2.70
2	✓	✓	✓	✓	✓	✓	75.11	✓	1033	1035	✓	75.16	1.0	2ND RUN, COLLECT MW 9884-011 2VOAS METALS ANIONS HEX C-
3	✓	✓	✓	✓	✓	✓	74.13	✓	1052	1054	✓	74.11	0.5	3RD RUN; PERCHLORATE; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 134.19 PSIA

Total Volume: 2.5 ℓ

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 513 Date: 10/30/95

Well Name: MW-4 Sampling Zone No.: 5 Starting Time: 0840 Finishing Time: 0955

Technicians J. BRENNER, B. DOMANSKI

Water Level Inside MP Casing (Beginning of Session) 127.95 (PSIA) (End of Session) 127.86 (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	✓	✓	✓	✓	✓	✓	127.95	✓	0851	0853	✓	127.98	1.0	1ST RUN; INITIAL PARAMETERS, NTU'S = 2.94
2	✓	✓	✓	✓	✓	✓	127.86	✓	0915	0918	✓	127.81	1.0	2ND RUN; COLLECT MW-9694-012; 2 VOAS METALS, ANIONS, HEX. C.
3	✓	✓	✓	✓	✓	✓	127.83	✓	0942	0945	✓	127.86	1.0	3RD RUN, PERCHLORATE; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 151.33 PSIA

Total Volume: 3.0 [F2]

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 149 Date: 10/27/98

Well Name: MW-11 Sampling Zone No.: 1 Starting Time: 1425 Finishing Time: 1525

Technicians J. BRENNER, B DIMENSIL

Water Level Inside MP Casing (Beginning of Session) 14.42 (PSIA) (End of Session) 14.41 (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	✓	✓	✓	✓	✓	✓	14.42	✓	1431	1435	✓	14.39	1.0	1ST RUN, INITIAL PARAMETERS; NTUS = 1.39
2	✓	✓	✓	✓	✓	✓	14.40	✓	1450	1457	✓	14.38	1.0	2ND RUN; COLLECT MW-954-0220 2VOAS, METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	14.42	✓	1513	1518	✓	14.41	1.0	3RD RUN; HEX. Cr, ClO4; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 29.02 PSIA

Total Volume: 3.0L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 259 Date: 10/27/98

Well Name: MW-11 Sampling Zone No.: 2 Starting Time: 1320 Finishing Time: 1420

Technicians: J. BRENNER, B DUMENSIL

Water Level Inside MP Casing (Beginning of Session) 14.59 (PSIA) (End of Session) 14.57 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.59	✓	1330	1333	✓	14.52	1.0	1ST RUN; INITIAL PARAMETERS; NTUS = 3.71
2	✓	✓	✓	✓	✓	✓	14.53	✓	1347	1350	✓	14.51	1.0	2ND RUN; COLLECT MW-984-21, MW-984-021MS, MW-984MSD
~~3~~	—	—	—	—	—	—	—	—	—	—	—	—	—	6 VOAS, METALS, 1/4 ANIONS
~~4~~ 3	✓	✓	✓	✓	✓	✓	14.56	✓	1408	1411	✓	14.57	1.0	3RD RUN; 3/4 ANIONS; HEX. Cr., ClO_4. FINAL PARAMETERS
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: PRESS. OUTSIDE MP CASING = 63.19 PSIA

Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling

Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 429 Date: 11/19/98

Well Name: MW-11 Sampling Zone No.: 3 Starting Time: 1055 Finishing Time: 1210

Technicians: J. BRENNER; M. SCHNEIDER

Water Level Inside MP Casing (Beginning of Session): 69.87 (PSIA) (End of Session): 69.81 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	69.87	✓	1110	1112	✓	69.89	1.0	1ST RUN; INITIAL PARAMETERS NTUS = 4.47
2	✓	✓	✓	✓	✓	✓	69.84	✓	1132	1134	✓	69.89	1.0	2ND RUN; COLLECT MW-984-022; 2 VOAS, METALS, ANIONS, HEX. Cr
3	✓	✓	✓	✓	✓	✓	69.84	✓	1154	1156	✓	69.81	1.0	3RD RUN; ClO_4; FINAL PARAMETERS; [illegible] 1.13
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 129.51 PSIA

Total Volume: 3.0 ℓ

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 524 Date: 11/19/98

Well Name: MW-11 Sampling Zone No.: 4 Starting Time: 0935 Finishing Time: 1050

Technicians: J. BRENNER, M. SCHNEIDER

Water Level Inside MP Casing (Beginning of Session) 109.57 (PSIA) (End of Session) 108.57 (PSIA)

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	109.57	✓	0944	0946	✓	109.64	1.0	1ST RUN, INITIAL PARAMETERS, NTUS = 4.52
2	✓	✓	✓	✓	✓	✓	109.56	✓	1006	1008	✓	109.62	1.0	2ND RUN, COLLECT MW 7641-073 ZVOAS, METALS, ANIONS, HEX. CR
3	✓	✓	✓	✓	✓	✓	109.59	✓	1031	1034	✓	109.57	0.5	3RD RUN, C104, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS OUTSIDE MP CASING = 166.73 PSIA

Total Volume: 2.5 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 639 Date: 11/19/98

Well Name: MW-11 Sampling Zone No.: 5 Starting Time: 0810 Finishing Time: 0930

Technicians J. BRENNER, M. SCHNEIDER

Water Level Inside MP Casing (Beginning of Session) 159.30 (TS.A) (End of Session) 158.16 (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	✓	✓	✓	✓	✓	✓	159.30	✓	0824	0826	✓	159.28	1.0	1ST RUN, INITIAL PARAMETERS NTUS = 1.42
2	✓	✓	✓	✓	✓	✓	159.24	✓	0849	0851	✓	159.21	1.0	2ND RUN, COLLECT MW-9951-024, 2 VOAS, METALS, ANIONS, HEXCR
3	✓	✓	✓	✓	✓	✓	158.18	✓	0916	0918	✓	158.16	0.5	3RD RUN; C104; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS OUTSIDE MP CASING = 190.49 TS.A

Total Volume: 2.5ℓ

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 140 ft Date: 11/9/98

Well Name: MW-12 Sampling Zone No.: 1 Starting Time: 1120 Finishing Time: 1520

Technicians B. Dumesnil, J. Brenner

Water Level Inside MP Casing (Beginning of Session) 14.53 (PSIA) (End of Session) 14.53 (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	✓	✓	✓	✓	✓	✓	14.53	✓	1125	1127	✓	14.52	1.0	1st Run Initial Parameters NTUs = 672
2	✓	✓	✓	✓	✓	✓	14.52	✓	1145	1150	✓	14.55	1.0	2nd Run More Parameters Attempting to Reduce turbidity
3							14.54							
4	✓	✓	✓	✓	✓	✓	15.35	✓	1415	1420	✓	14.53	1.0	4th Run After Purging approx 6 gals NTUs = 11.2
5	✓	✓	✓	✓	✓	✓	14.53	✓	1435	1440	✓	14.56	1.0	2nd Run COLLECT MW-984-025 VOCs, Metals, Anions
6	✓	✓	✓	✓	✓	✓	14.52	✓	1503	1510	✓	14.53	1.0	3rd Run Final Parameters Hex Cr, ClO_4
7														
8														
9														
10														
11														
12														

Comments: PRESS OUTSIDE MP CASING = 29.96 PSIA

Total Volume: 5.0 L [F-2]

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 243 Date: 11/5/98

Well Name: MW-12 Sampling Zone No.: 2 Starting Time: 1445 Finishing Time: 1530

Technicians J. BRENNER, B. DOMESNIL

Water Level Inside MP Casing (Beginning of Session) 43.46 (PSIA) (End of Session) 43.44 (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	✓	✓	✓	✓	✓	✓	43.46	✓	1451	1456	✓	43.45	1.0	1ST RUN, INITIAL PARAMETERS NM's = 4.86
2	✓	✓	✓	✓	✓	✓	43.43	✓	1503	1507	✓	43.44	1.0	QUEST MW-901-026 & 027 (DUP) 4 VOAS, 2 METALS, 1/2 ANIONS
3	✓	✓	✓	✓	✓	✓	43.45	✓	1517	1521	✓	43.44	1.0	3RD 12 VOA'S, 1/2 ANIONS, 2 HEX. Cr, 2 Cl04 FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 68.56 (PSIA)

Total Volume: 3.0L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 323 Date: 11/5/96

Well Name: MW-12 Sampling Zone No.: 3 Starting Time: 1535 Finishing Time: 1615

Technicians B Domesnil, J Brenner

Water Level Inside MP Casing (Beginning of Session) 78.21 (BSIM) (End of Session) 77.62 (BSIA)

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	✓	✓	✓	✓	✓	✓	78.21	✓	1540	1542	✓	78.80	1.0	1ST RUN, Initial Parameters NTUs = 4.16
2	✓	✓	✓	✓	✓	✓	78.79	✓	1550	1555	✓	78.67	1.0	2nd RUN COLLECT MW-484-020 VOCs, Metal, Anions
3	✓	✓	✓	✓	✓	✓	76.99	✓	1605	1607	✓	77.62	0.5	3RD RUN, Final Parameters Hex Cr, Cl$_4$
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS OUTSIDE MP CASING = 101.56 PSIA

Total Volume: 2.5 L[F2]

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 430 ft Date: 11/9/98

Well Name: MW-12 Sampling Zone No.: 4 Starting Time: 0900 Finishing Time: 1115

Technicians B. Dumesnil, J. Brenner

Water Level Inside MP Casing (Beginning of Session) 111.68 (PS.A) (End of Session) 111.51 (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	✓	✓	✓	✓	✓	✓	111.68	✓	1010	1013	✓	111.71	1.0	1st Run to get Initial Parameters NTUs = 4.24
2	✓	✓	✓	✓	✓	✓	111.68	✓	1035	1037	✓	111.84	1.0	2nd Run to Collect 984-029 VOCs Metals Anions
3	✓	✓	✓	✓	✓	✓	111.49	✓	1057	1103	✓	111.51	0.5	3rd Run final Parameters Hex Cr, ClO4
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS OUTSIDE MP CASING = 14402 PSIA

Total Volume: 2.5 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 548 ft Date: 11/9/98

Well Name: MW-12 Sampling Zone No.: 5 Starting Time: 0825 Finishing Time: 1000

Technicians B. Dumeshil J. Brenner

Water Level Inside MP Casing (Beginning of Session) 160.48 (FS.A) (End of Session) 160.46 (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	✓	✓	✓	✓	✓	✓	160.48	✓	0845	0847	✓	160.48	1.0	1ST RUN INITIAL PARAMETERS NTUS = 1.28
2	✓	✓	✓	✓	✓	✓	160.49	✓	0910	0913	✓	160.46	1.0	2nd Run COLLECT MW-98A-080 VOC, Metals, Anions, HS, MOD
3	✓	✓	✓	✓	✓	✓	160.42	✓	0936	0940	✓	160.46	1.0	3rd Run Final parameters Hex Cr, ClO_4
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS OUTSIDE MP CASING = 164.36 PSIA

Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 207 Date: 11/10/95

Well Name: MW-14 Sampling Zone No.: 1 Starting Time: 1340 Finishing Time: 1430

Technicians J. BRENNER, B. DUMENIL

Water Level Inside MP Casing (Beginning of Session) 14.58 (PSIA) (End of Session) 14.61 (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	✓	✓	✓	✓	✓	✓	14.50	✓	1345	1350	✓	14.57	1.0	1ST RUN, INITIAL PARAMETERS NTUS = 4.19
2	✓	✓	✓	✓	✓	✓	14.56	✓	1404	1409	✓	14.56	1.0	2ND RUN, COLLECT MW-9754-033, 2 VOAS METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	14.55	✓	1424	1429	✓	14.61	1.0	3RD RUN, HEAVY CLOG, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 29.86 PSIA

Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 277 Date: 11/10/98

Well Name: MW-14 Sampling Zone No.: 2 Starting Time: 1240 Finishing Time: 1330

Technicians J. BRENNER; B. DUMESNIL

Water Level Inside MP Casing (Beginning of Session) 39.26 (PSIA) (End of Session) 38.09 (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	✓	✓	✓	✓	✓	✓	39.26	✓	1245	1249	✓	39.29	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 4.27
2	✓	✓	✓	✓	✓	✓	39.19	✓	1307	1310	✓	39.19	1.0	2ND RUN; COLLECT MW-954-032 VOAS, METALS, ANIONS, HEX. C.
3	✓	✓	✓	✓	✓	✓	38.07	✓	1326	1329	✓	38.09	0.5	3RD RUN; C104, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 59.89 PSIA

Total Volume: 2.5 F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 382 Date: 11/10/98

Well Name: MW-14 Sampling Zone No.: 3 Starting Time: 1130 Finishing Time: 1285

Technicians: J. BRENNER, B. DUMESNIL

Water Level Inside MP Casing (Beginning of Session) 84.90 (PS.A) (End of Session) 83.83 (PS.A)

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	✓	✓	✓	✓	✓	✓	84.88	✓	1139	1142	✓	84.81	1.0	1ST RUN; INITIAL PARAMETERS NTUS = 0.84
2	✓	✓	✓	✓	✓	✓	84.74	✓	1200	1204	✓	84.76	1.0	2ND RUN; COLLECT MW-984-035 SVOA'S, METALS, ANIONS, HEX CR
3	✓	✓	✓	✓	✓	✓	83.81	✓	1220	1222	✓	83.83	0.5	3RD RUN; CLEAN FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 105.21 PS.A

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: 456 Date: 11/10/98

Well Name: MW-14 Sampling Zone No.: 4 Starting Time: 1000 Finishing Time: 1110

Technicians: J. BRENNER, B. DOMESNIL

Water Level Inside MP Casing (Beginning of Session) 117.19 (PS,A) (End of Session) 117.17

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	117.19	✓	1012	1015	✓	117.20	1.0	1ST RUN, INITIAL PARAMETERS NTUS = 2.26
2	✓	✓	✓	✓	✓	✓	117.17	✓	1034	1037	✓	117.17	1.0	2ND RUN, COLLECT MW-#14-036 -036MS-036MSD, 6VOAS, METALS
3	✓	✓	✓	✓	✓	✓	117.15	✓	1100	1103	✓	117.17	1.0	3RD RUN, ANIONS, HEX. Cr, ClO4 FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 137.32 PS,A

Total Volume: 30L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 540 Date: 11/10/99

Well Name: MW-14 Sampling Zone No.: 5 Starting Time: 0840 Finishing Time: 0955

Technicians: J. BRUNER, B. DUMESNIL

Water Level Inside MP Casing (Beginning of Session) 153.98 (PS.A) (End of Session) 152.79 (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	✓	✓	✓	✓	✓	✓	153.98	✓	0851	0854	✓	153.97	1.0	1ST RUN, INITIAL PARAMETERS NTUs = 4.45
2	✓	✓	✓	✓	✓	✓	153.90	✓	0917	0921	✓	153.88	1.0	2ND RUN, COLLECT MW-9599-037, 2 VOAs, METALS, ANIONS, HEX.C
3	✓	✓	✓	✓	✓	✓	152.80	✓	0944	0946	✓	152.79	0.5	3RD, C104, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 173.53 PSIA

Total Volume: 2.5 L

F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 250 Date: 11/4/98

Well Name: MW-17 Sampling Zone No.: 1 Starting Time: 1315 Finishing Time: 1425

Technicians J. BIZZARRO; B. DUMESNIL

Water Level Inside MP Casing (Beginning of Session) 14.48 (PS.A) (End of Session) 14.43 (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	✓	✓	✓	✓	✓	✓	14.48	✓	1322	1327	✓	14.49	1.0	1ST RUN; INITIAL PARAMETERS; NTUS = 0-46
2	✓	✓	✓	✓	✓	✓	14.43	✓	1343	1348	✓	14.46	1.0	2ND RUN; COLLECT MW-964-040; 2 VOAS, METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	14.53	✓	1412	1416	✓	14.43	1.0	3RD RUN; HEX CR, ALK; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 34.45 PS.A

Total Volume: 3.0L

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling

Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 370 Date: 11/4/98

Well Name: MW-17 Sampling Zone No.: 2 Starting Time: 1150 Finishing Time: 1305

Technicians J. BRENNER, B. DUMESNIL

Water Level Inside MP Casing (Beginning of Session) 19.51 (PSIA) (End of Session) 19.49 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	✓	✓	✓	✓	✓	✓	19.51	✓	1155	1201	✓	19.53	1.0	1ST RUN TO SCREEN # 2 INITIAL PARAMETERS; NTU'S = 1.66
2	✓	✓	✓	✓	✓	✓	19.49	✓	1227	1231	✓	19.50	1.0	2ND RUN; COLLECT MW-954-04; 6 VOAS METALS (MS/MSD) 04MS 04MSD
3	✓	✓	✓	✓	✓	✓	19.36	✓	1256	1300	✓	19.49	1.0	3RD RUN; ANIONS HEX. Cr., ClO4 FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 80.05 PSIA

Total Volume: 3.0 ℓ

F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 468 Date: 10/27/98

Well Name: MW17 Sampling Zone No.: 3 Starting Time: 0835 Finishing Time: 1030

Technicians: J. BRENNAN, B. DEMENSIL

Water Level Inside MP Casing (Beginning of Session) 62.31 (PS.A) (End of Session) 62.15 (PS.A)

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	✓	✓	✓	✓	✓	✓	62.31	✓	0843	0847	✓	62.33	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 4.40
2	✓	✓	✓	✓	✓	✓	62.25	✓	0907	0910	✓	62.25	1.0	2ND RUN; COLLECT MW-954-042, VOAS; 1,4-DIOXANE
3	✓	✓	✓	✓	✓	✓	62.24	✓	0933	0937	✓	62.26	1.0	3RD RUN; NDMA (3/4)
4	✓	✓	✓	✓	✓	✓	62.26	✓	0957	1000	✓	62.26	1.0	4TH RUN; NDMA (1/4), METALS, ANIONS
5	✓	✓	✓	✓	✓	✓	62.16	✓	1020	1023	✓	62.15	1.0	5TH RUN, HEX. CR., PERCHLORATE; FINAL PARAMETERS
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 117.01 PSIA

Total Volume: 5.0L

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 562 Date: 11/4/98

Well Name: MW-17 Sampling Zone No.: 4 Starting Time: 1025 Finishing Time: 1145

Technicians J. BRENNER, B. DOMESNIL

Water Level Inside MP Casing (Beginning of Session) 111.62 (PS.A) (End of Session) 110.55 PS.A

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 (Sample)	Valve Open Time	Valve Closed Time	Deactivate (Sample)	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	111.62	✓	1037	1039	✓	111.64	1.0	1ST RUN; INITIAL PARAMETERS. NTUS = 1.89
2	✓	✓	✓	✓	✓	✓	111.60	✓	1109	1111	✓	111.60	1.0	2ND RUN; COLLECT MW-9854-043; 2 VOAS, METALS, ANION, HEX. CR.
3	✓	✓	✓	✓	✓	✓	110.57	✓	1143	1136	✓	110.55	0.5	3RD RUN; C104; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = ~~40~~ 40.41 PS.A

Total Volume: 2.5

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 726 Date: 11/4/98

Well Name: MW-17 Sampling Zone No.: 5 Starting Time: 0840 Finishing Time: 1020

Technicians J. BRENNER, B. DUMESNIL

Water Level Inside MP Casing (Beginning of Session) 174.34 (PSIA) (End of Session) 174.27 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	174.34	✓	0853	0855	✓	174.35	1.0	1ST RUN TO SCREEN #5, INITIAL PARAMETERS; NTU's = 5.07
2	✓	✓	✓	✓	✓	✓	174.33	✓	0924	0928	✓	174.32	1.0	2ND RUN; COLLECT MW-5S4-044 2 VOAS, METALS, ANIONS, HEX Cr
3	✓	✓	✓	✓	✓	✓	174.25	✓	0958	1002	✓	174.27	1.0	3RD RUN; CN04, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 198.67 PSIA

Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPC Location: MW-18 Depth: 270 Date: 10/22/02

Well Name: MW-18 Sampling Zone No.: 1 Starting Time: 1440 Finishing Time: 1545

Technicians J. BRENNER, B. DOMENSIC

Water Level Inside MP Casing (Beginning of Session) 14.07 PSIA (End of Session) 14.16 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	✓	✓	✓	✓	✓	✓	14.07	✓	1444	1449	✓	14.18	1.0	1ST RUN; INITIAL PARAMETERS; NTUS = 2.29
2	✓	✓	✓	✓	✓	✓	14.21	✓	1505	1510	✓	14.12	1.0	2ND RUN; COLLECT MW-9 @ 1445 2 VOA; METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	14.29	✓	1525	1532	✓	14.16	1.0	3RD RUN; HEX. CR., PERCHL.; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

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Comments: PRESS. OUTSIDE MP CASING = 24.69 PSIA

Total Volume: 3.0

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-18 Depth: 330 Date: 10/22/98

Well Name: MW-18 Sampling Zone No.: 2 Starting Time: 1330 Finishing Time: 1425

Technicians J. BRENNER, B. DUMENSIL

Water Level Inside MP Casing (Beginning of Session) 14.28 PSIA (End of Session) 14.20 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	✓	✓	✓	✓	✓	✓	14.29	✓	1335	1339	✓	14.26	1.0	1ST RUN: INITIAL PARAMETERS; NTU'S = 1.94
2	✓	✓	✓	✓	✓	✓	14.29	✓	1355	1359	✓	14.24	1.0	2ND RUN, COLLECT MW-984-046; MW-984-046MS; MW-984-046MSD
3	–	–	–	–	–	–	–	–	–	–	–	–	–	6 VOAS, METALS, ANIONS
4	✓	✓	✓	✓	✓	✓	14.14	✓	1419	1423	✓	14.20	1.0	3RD RUN, HEX. CR.; PERCHLORATE; FINAL PARAMETERS
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. INSIDE MP CASING = 50.36 PSIA

Total Volume: 3.0

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-18 Depth: 424 Date: 10/22/98

Well Name: MW-18 Sampling Zone No.: 3 Starting Time: 1220 Finishing Time: 1320

Technicians: J. BRENNER, B. DUMENSIL

Water Level Inside MP Casing (Beginning of Session) 37.90 PSIA (End of Session) 36.80 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	✓	✓	✓	✓	✓	✓	37.90	✓	1230	1235	✓	37.92	1.0	1ST RUN, INITIAL PARAMETERS NNS = 1.74
2	✓	✓	✓	✓	✓	✓	37.84	✓	1253	1256	✓	37.85	1.0	2ND RUN, COLLECT MW-18I-(47), 2 VOAS, METALS, ANIONS, HEX. C.
3	✓	✓	✓	✓	✓	✓	36.83	✓	1315	1317	✓	36.80	0.5	3RD RUN, FORMALDATE, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 88.92 PSIA

Total Volume: 2.5L F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-19 Depth: 564 Date: 10/22/98

Well Name: MW-18 Sampling Zone No.: 4 Starting Time: 1100 Finishing Time: 1210

Technicians: J. BRENNAN, B. DJMENSIL

Water Level Inside MP Casing (Beginning of Session) 98.86 PSIA (End of Session) 97.79 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	✓	✓	✓	✓	✓	✓	98.86	✓	1109	1112	✓	98.89	1.0	1ST RUN, INITIAL PARAMETERS, NTU'S = 4.61
2	✓	✓	✓	✓	✓	✓	98.84	✓	1135	1139	✓	98.89	1.0	2ND RUN, 2 VOAS, METALS, ANIONS, HEX. Cr
3	✓	✓	✓	✓	✓	✓	97.76	✓	1201	1203	✓	97.79	0.5	3RD RUN, PERCHLORATE, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 135.14 PSIA

Total Volume: 2.5L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-18 Depth: 684 Date: 10/22/95

Well Name: MW-18 Sampling Zone No.: 5 Starting Time: 0920 Finishing Time: 1055

Technicians: J. BRENNER, B. DUMANSKI

Water Level Inside MP Casing (Beginning of Session) ~~152.05~~ 151.14 (PSIA) (End of Session) 150.07 (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	✓	✓	✓	✓	✓	✓	~~151.14~~ ~~152.05~~	✓	0930	0942	✓	151.16	1.0	1ST RUN; INITIAL PARAMETERS; MTWS = 2.75
2	✓	✓	✓	✓	✓	✓	151.05	✓	1010	1012	✓	151.07	1.0	2ND RUN; COLLECT MW-18-049; 2 VOAS, METALS, ANIONS, HEXC
3	✓	✓	✓	✓	✓	✓	150.04	✓	1042	1043	✓	150.09	0.5	3RD RUN; PURGE/LOCATE; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS OUTSIDE MP CASING = 179.89 PSIA

Total Volume: 2.5L

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL   Location: MW-19   Depth: 242   Date: 10/23/98

Well Name: MW-19   Sampling Zone No.: 1   Starting Time: 1415   Finishing Time: 1510

Technicians: J. BRENNER, B. DUMENSIL

Water Level Inside MP Casing (Beginning of Session): 14.26 (PSIA)   (End of Session): 14.13 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	✓	✓	✓	✓	✓	✓	14.26	✓	1420	1425	✓	14.25	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 12.5
2	✓	✓	✓	✓	✓	✓	14.13	✓	1437	1441	✓	14.16	1.0	2ND RUN; ATTEMPTING TO REDUCE TURBIDITY; NTU'S = 3.69 / COLLECT MW-9... 2 VOA -05, ...
3	✓	✓	✓	✓	✓	✓	14.06	✓	1457	1501	✓	14.13	1.0	3RD RUN; ANIONS, HEX. CR., PERCH, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 48.03 PSIA

Total Volume: 3.0 L

F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-19 Depth: 314 Date: 10/23/98

Well Name: MW-19 Sampling Zone No.: 2 Starting Time: 1315 Finishing Time: 1410

Technicians J. BRENNER, B. DJMANSIL

Water Level Inside MP Casing (Beginning of Session) 14.16 PS.A (End of Session) 14.30 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	✓	✓	✓	✓	✓	✓	14.16	✓	1323	1326	✓	14.18	1.0	1ST RUN, INITIAL PARAMETERS NTU'S = 478
2	✓	✓	✓	✓	✓	✓	14.15	✓	1340	1342	✓	14.22	1.0	2ND RUN, COLLECT MW-954-051, ZVOAS, METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	14.32	✓	1402	1404	✓	14.30	1.0	3RD RUN, HEX. CR. PERCHLORATE, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: PRESS. OUTSIDE MP CASING = 71.88 PS.A

Total Volume: 30L

Continue

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-19 Depth: 392 Date: 10/23/98

Well Name: MW-19 Sampling Zone No.: 3 Starting Time: 1210 Finishing Time: 1310

Technicians J. BRENNER, B. DUMENSIL

Water Level Inside MP Casing (Beginning of Session) 40.47 PSIA (End of Session) 40.34 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	40.47	✓	1219	1222	✓	40.48	1.0	1ST RUN, INITIAL PARAMETERS; MTU'S = 3.40
2	✓	✓	✓	✓	✓	✓	40.51	✓	1239	1241	✓	40.53	1.0	2ND RUN; COLLECT MW-924-052, MW-924-053AS MW-924-053AD; 6 VOAS 500ml METALS
3	✓	✓	✓	✓	✓	✓	40.36	✓	1301	1304	✓	40.34	1.0	3RD RUN; ANIONS, HEX. Cr, PERCHLORATE; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 102.65 PSIA

Total Volume: 3.0L

F-2