REPORT

QUARTERLY GROUNDWATER MONITORING RESULTS, FEBRUARY-MARCH 1999

AT THE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
JET PROPULSION LABORATORY
4800 Oak Grove Drive
Pasadena, California 91109

Prepared by:

FOSTER WHEELER ENVIRONMENTAL CORPORATION
611 Anton Boulevard, Suite 800
Costa Mesa, California 92626

May, 1999

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF FIGURES

(Continued)

EXECUTIVE SUMMARY

Presented in this report are the results of the tenth quarterly groundwater sampling event (February-March 1999) 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 February 24 to March 23, 1999, 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 three wells. To date, an MCL has not been established for hexavalent chromium. Arsenic was detected in one well at a concentration below both state and Federal MCLs. Total chromium was infrequently detected at levels well below its MCL. Lead was detected in five wells 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 tenth groundwater sampling event completed as part of the 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 February 24 to March 23, 1999, 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 (February 19, 1999), and after (March 24, 1999) 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 both 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 February 24 to March 23, 1999. 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 February-March 1999 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 February-March 1999 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 ten long-term quarterly sampling events completed to date is provided in Table 3-4.

CCl_4 in excess of the state MCL (0.5 µg/L) was found in eight 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 met or exceeded the state and Federal MCL (5.0 µg/L) in six on-site wells, and one off-site well (Table 3-3, Figures 3-4, 3-5, and 3-6). The highest levels of TCE were found in on-site wells MW-7, MW-13 , MW-16 and off-site well MW-21 (Screen 1).

1,2-DCA was detected in two on-site wells (MW-13 and MW-16) in excess of its state MCL (0.5 µg/L) (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 February-March 1999 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 seven of the thirteen wells exceeded the Interim Action Level (18 µg/L). Perchlorate concentrations are contoured in Figures 3-11, 3-12 and 3-13 for aquifer Layers 1, 2 and 3, respectively. The highest ClO_4^- levels were observed on-site in wells MW-7, MW-13, MW-16, and MW-24 (Screen 2).

3.3 METALS RESULTS

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

Total As was detected in only one JPL groundwater sample at a concentration well below both state and Federal MCLs during the February-March 1999 event. Total Pb was detected at a level well below the state and Federal Action Level (0.015 mg/L) in five wells, MW-17, MW-18, MW-20 and MW-24. Total Cr was detected in four wells, MW-6, MW-13, MW-16 and MW-24 (Screen 3)] at concentrations below state and Federal drinking water standards (0.05 and 0.10 mg/L, respectively). Hexavalent chromium was detected in two on-site shallow wells MW-13

and MW-16; and one off-site well (MW-18). 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 ten 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 February-March 1999 sampling event and analyzed for 1,4-dioxane and NDMA to 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 February-March 1999 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).

Seventeen equipment blanks and twenty trip blanks were submitted for analysis during the February-March 1999 sampling event. Freon 113 was detected in five of the trip blanks and five of the equipment blanks. Freon was also detected in the associated method blanks and most of the associated groundwater samples. Most of these groundwater samples were from wells in which Freon 113 had not previously been detected. Because of this, and because Freon 113 was

detected in all laboratory method blanks with these samples, the presence of Freon 113 in the equipment blanks (and the groundwater samples) is attributed to laboratory contamination. This has been confirmed in the laboratory reports and via phone conversation with the laboratory.

Low levels of dichloromethane were also detected in two trip blanks and three equipment blanks. Dichloromethane is a common laboratory contaminant and has been detected in various QA/QC blanks in the past. Dichloromethane was not detected in associated groundwater samples, and therefore, cross contamination of samples is not indicated.

Chloroform was detected at very low levels (<2.6 μg/L) in one equipment blank, and 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 may be present in the decontamination water.

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 February-March 1999 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 February-March 1999 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 February-March 1999 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 February-March 1999 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 February-March 1999 sampling event are within the ideal range ($\pm$5 percent) for all wells. 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 February-March 1999 water-chemistry results fell within the ideal range (1.0 to 1.2) for 73 of the 75 sets of water chemistry analyses performed (Table 4-3). The ratio for the remaining four 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 February 19, 1999, and after sampling, on March 24, 1999, 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

EPA, 1991. Management of Investigation-Derived Wastes During Site Inspections: USEPA Office of Research and Development: EPA/540/G-91/009, May 1991, 35 pp.

EPA, 1992. Guide to Management of Investigation-Derived Wastes: USEPA Office of Solid Wastes and Emergency Response, Publication: 9345.3-03FS, April 1992.

Ebasco, 1993a. Field Sampling and Analysis Plan for Performing a Remedial Investigation at Operable Unit 1: On-Site Groundwater. NASA-Jet Propulsion Laboratory. December, 1993.

Ebasco, 1993b. Quality Assurance Program for Performing a Remedial Investigation for the NASA-Jet Propulsion Laboratory. December, 1993.

Ebasco, 1994. Field Sampling and Analysis Plan for Performing a Remedial Investigation at Operable Unit 3: Off-Site Groundwater. NASA-Jet Propulsion Laboratory. May, 1994.

Freeze, A. R., and Cherry, J. A., 1979. Groundwater. Prentice Hall, Englewood Cliffs, New Jersey, 604 pp.

Oppenheimer, J., and Eaton, D., 1986. Quality Control in Mineral Analysis, WQTC, Houston, Texas. Proceedings, pp. 15-34.

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

TABLE 1-1

SUMMARY OF WELL CONSTRUCTION DETAILS FOR JPL GROUNDWATER MONITORING WELLS

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

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1999

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-991-079	GW	X	X	X	X	X		
MW-3									
Screen 1	MW-991-078	GW	X	X	X	X	X		
Screen 2	MW-991-077	GW	X	X	X	X	X		
Screen 3	MW-991-076	GW	X	X	X	X	X		
Screen 4	MW-991-075	GW	X	X	X	X	X		
Screen 5	MW-991-074	GW	X	X	X	X	X		
MW-4									
Screen 1	MW-991-073	GW	X	X	X	X	X		
Screen 2	MW-991-072	GW	X	X	X	X	X	X	X
Screen 2	MW-991-071	DUP	X	X (no cations)	X		X		
Screen 3	MW-991-070	GW	X	X	X	X	X		
Screen 4	MW-991-069	GW	X	X	X	X	X		
Screen 5	MW-991-068	GW	X	X	X	X	X		
MW-5	MW-991-067	GW	X	X	X	X	X		
MW-6	MW-991-066	GW	X	X	X	X	X		
MW-7	MW-991-065	GW	X	X	X	X	X	X	X
MW-8	MW-991-064	GW	X	X	X	X	X		
MW-9	MW-991-063	GW	X	X	X	X	X		
MW-10	MW-991-062	GW	X	X	X	X	X		
MW-10	MW-991-061	DUP	X	X (no cations)	X		X		
MW-11									
Screen 1	MW-991-060	GW	X	X	X	X	X		
Screen 2	MW-991-059	GW	X	X	X	X	X		
Screen 3	MW-991-058	GW	X	X	X	X	X		
Screen 4	MW-991-057	GW	X	X	X	X	X		
Screen 5	MW-991-056	GW	X	X	X	X	X		

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1999

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-991-055	GW	X	X	X	X	X		
Screen 2	MW-991-054	GW	X	X	X	X	X		
Screen 2	MW-991-053	DUP	X	X (no cations)	X		X		
Screen 3	MW-991-052	GW	X	X	X	X	X		
Screen 4	MW-991-051	GW	X	X	X	X	X		
Screen 5	MW-991-050	GW	X	X	X	X	X		
MW-13	MW-991-049	GW	X	X	X	X	X	X	X
MW-13	MW-991-048	DUP	X	X (no cations)	X		X		
MW-14									
Screen 1	MW-991-047	GW	X	X	X	X	X		
Screen 2	MW-991-046	GW	X	X	X	X	X		
Screen 3	MW-991-045	GW	X	X	X	X	X		
Screen 4	MW-991-044	GW	X	X	X	X	X		
Screen 5	MW-991-043	GW	X	X	X	X	X		
MW-15	MW-991-042	GW	X	X	X	X	X		
MW-16	MW-991-041	GW	X	X	X	X	X	X	X
MW-17									
Screen 1	MW-991-040	GW	X	X	X	X	X		
Screen 2	MW-991-039	GW	X	X	X	X	X		
Screen 3	MW-991-038	GW	X	X	X	X	X	X	X
Screen 4	MW-991-037	GW	X	X	X	X	X		
Screen 5	MW-991-036	GW	X	X	X	X	X		
MW-18									
Screen 1	MW-991-035	GW	X	X	X	X	X		
Screen 2	MW-991-034	GW	X	X	X	X	X		
Screen 3	MW-991-033	GW	X	X	X	X	X		
Screen 4	MW-991-032	GW	X	X	X	X	X		
Screen 5	MW-991-031	GW	X	X	X	X	X		

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1999

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-991-030	GW	X	X	X	X	X		
Screen 2	MW-991-029	GW	X	X	X	X	X		
Screen 3	MW-991-028	GW	X	X	X	X	X		
Screen 4	MW-991-027	GW	X	X	X	X	X		
Screen 5	MW-991-026	GW	X	X	X	X	X		
MW-20									
Screen 1	MW-991-025	GW	X	X	X	X	X		
Screen 2	MW-991-024	GW	X	X	X	X	X		
Screen 3	MW-991-023	GW	X	X	X	X	X		
Screen 4	MW-991-022	GW	X	X	X	X	X		
Screen 5	MW-991-021	GW	X	X	X	X	X		
MW-21									
Screen 1	MW-991-020	GW	X	X	X	X	X		
Screen 2	MW-991-019	GW	X	X	X	X	X		
Screen 3	MW-991-018	GW	X	X	X	X	X		
Screen 4	MW-991-017	GW	X	X	X	X	X		
Screen 5	MW-991-016	GW	X	X	X	X	X		
MW-22									
Screen 1	MW-991-015	GW	X	X	X	X	X		
Screen 2	MW-991-014	GW	X	X	X	X	X		
Screen 3	MW-991-013	GW	X	X	X	X	X		
Screen 4	MW-991-012	GW	X	X	X	X	X		
Screen 5	MW-991-011	GW	X	X	X	X	X		
MW-23									
Screen 1	MW-991-010	GW	X	X	X	X	X		
Screen 2	MW-991-009	GW	X	X	X	X	X		
Screen 3	MW-991-008	GW	X	X	X	X	X		
Screen 4	MW-991-007	GW	X	X	X	X	X		
Screen 5	MW-991-006	GW	X	X	X	X	X		

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1999

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-991-005	GW	X	X	X	X	X	X	X
Screen 2	MW-991-004	GW	X	X	X	X	X		
Screen 3	MW-991-003	GW	X	X	X	X	X		
Screen 4	MW-991-002	GW	X	X	X	X	X		
Screen 5	MW-991-001	GW	X	X	X	X	X		

GW: Groundwater Sample
DUP: Duplicate Sample

TABLE 3-2

LOCATION OF WELL SCREENS IN AQUIFER LAYERS

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

TABLE 3-2

LOCATION OF WELL SCREENS IN AQUIFER LAYERS

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

TABLE 3-2

LOCATION OF WELL SCREENS IN AQUIFER LAYERS

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

TABLE 3-3

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1999

(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-991-079	--	--	--	--	--	--	--	--	--	--
MW-3											
Screen 1	MW-991-078	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-991-077	--	--	--	--	--	--	--	--	--	--
Screen 3	MW-991-076	**4.5**	1.3	--	--	--	--	0.9	42	--	--
Screen 4	MW-991-075	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-991-074	--	--	--	--	--	--	--	--	--	--
MW-4											
Screen 1	MW-991-073	--	--	--	--	--	--	0.8(B)	--	--	--
Screen 2	MW-991-072	**1.2**	4.1	0.6	0.5	--	--	--	2.5	--	38
Screen 2 (DUP)	MW-991-071	**1.5**	**5.0**	0.8	--	--	--	--	2.9	--	38
Screen 3	MW-991-070	--	--	--	--	--	--	0.7(B)	--	--	--
Screen 4	MW-991-069	--	--	--	--	--	--	0.6(B)	--	--	--
Screen 5	MW-991-068	--	--	--	--	--	--	0.6(B)	--	--	--
MW-5	MW-991-067	--	--	--	--	--	--	--	--	--	--
MW-6	MW-991-066	--	0.8	3.8	1.0	--	--	--	0.6	--	--
MW-7	MW-991-065	**49**	17	0.6	--	--	0.9	2.0	7.2	--	150
MW-8	MW-991-064	--	--	--	--	--	--	--	--	--	--
MW-9	MW-991-063	--	--	--	--	--	--	--	--	--	--
MW-10	MW-991-062	--	**5.7**	--	--	--	--	--	0.9	--	39
MW-10 (DUP)	MW-991-061	--	**5.6**	--	--	--	--	--	0.9	--	39

TABLE 3-3

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1999

(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-991-060	--	--	--	--	--	--	0.9(B)	--	--	--
Screen 2	MW-991-059	--	--	--	--	--	--	0.7(B)	1.1	--	--
Screen 3	MW-991-058	--	--	--	--	--	--	0.7(B)	--	--	--
Screen 4	MW-991-057	--	--	--	--	--	--	0.7(B)	--	--	--
Screen 5	MW-991-056	--	--	--	--	--	--	0.7(B)	--	--	--
MW-12											
Screen 1	MW-991-055	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-991-054	**1.3**	--	--	--	--	--	--	0.9	--	4.1
Screen 2 (*DUP*)	MW-991-053	**1.4**	--	--	--	--	--	--	1.0	--	4.6
Screen 3	MW-991-052	**23**	--	--	--	--	--	--	4.5	--	--
Screen 4	MW-991-051	**4.5**	--	--	--	--	--	--	1.2	--	7.0
Screen 5	MW-991-050	**1.3**	--	--	--	--	--	--	0.7	--	--
MW-13	MW-991-049	**9.4**	**28**	--	--	**0.7**	0.7	--	11	--	98
MW-13 (DUP)	MW-991-048	**8.4**	**29**	--	--	**0.6**	0.6	--	9.8	--	98
MW-14											
Screen 1	MW-991-047	--	--	0.8	1.2	--	--	0.6(B)	0.6	--	4.2
Screen 2	MW-991-046	--	0.9	1.6	0.7	--	--	0.6(B)	0.6	--	4.2
Screen 3	MW-991-045	--	--	0.5	--	--	--	0.6(B)	0.5	--	5.9
Screen 4	MW-991-044	--	--	--	--	--	--	0.6(B)	--	--	--
Screen 5	MW-991-043	--	--	--	--	--	--	0.6(B)	--	--	--
MW-15	MW-991-042	--	--	--	--	--	--	--	--	--	--
MW-16	MW-991-041	**67**	**20**	1.4	--	**1.1**	1.8	1.1	24	--	790

TABLE 3-3

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1999

(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-991-040	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-991-039	--	--	--	--	--	--	1.0(B)	3.9	--	--
Screen 3	MW-991-038	--	1.6	--	--	--	--	--	3.8	--	4.2
Screen 4	MW-991-037	--	3.8	--	--	--	--	1.0(B)	1.8	--	9.8
Screen 5	MW-991-036	--	4.9	--	--	--	--	--	2.1	--	6.4
MW-18											
Screen 1	MW-991-035	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-991-034	--	--	--	--	--	--	--	3.0	0.8 Bromodichloromethane	--
Screen 3	MW-991-033	--	1.0	0.5	--	--	--	--	3.5	--	--
Screen 4	MW-991-032	4.7	1.2	2.3	--	--	--	--	1.1	--	24
Screen 5	MW-991-031	--	--	--	--	--	--	--	--	--	--
MW-19											
Screen 1	MW-991-030	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-991-029	--	0.6	--	--	--	--	--	--	--	--
Screen 3	MW-991-028	--	--	1.5	--	--	--	--	--	--	--
Screen 4	MW-991-027	--	--	--	--	--	--	--	3.0	--	--
Screen 5	MW-991-026	--	--	1.3	--	--	--	--	--	--	--
MW-20											
Screen 1	MW-991-025	--	--	--	--	--	--	--	2.2	--	4.9
Screen 2	MW-991-024	--	--	--	--	--	--	--	4.2	--	--
Screen 3	MW-991-023	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-991-022	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-991-021	--	--	--	--	--	--	--	--	--	--

TABLE 3-3

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1999

(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-991-020	--	**20**	0.5	--	--	--	--	1.8	--	14
Screen 2	MW-991-019	--	--	0.8	--	--	--	--	--	--	--
Screen 3	MW-991-018	--	--	1.0	--	--	--	--	--	--	4.1
Screen 4	MW-991-017	--	--	3.8	--	--	--	--	--	0.7 cis-1,2-Dichloroethene	--
Screen 5	MW-991-016	--	0.5	**7.7**	--	--	--	--	0.7	1.4 cis-1,2-Dichloroethene	4.2
MW-22											
Screen 1	MW-991-015	--	0.6	3.6	1.0	--	--	1.3(B)	0.5	--	6.4
Screen 2	MW-991-014	--	0.6	--	--	--	--	1.4(B)	--	--	--
Screen 3	MW-991-013	--	--	--	--	--	--	1.3(B)	--	--	--
Screen 4	MW-991-012	--	--	--	--	--	--	1.3(B)	--	--	--
Screen 5	MW-991-011	--	--	--	--	--	--	1.3(B)	--	--	--
MW-23											
Screen 1	MW-991-010	**0.6**	**15**	1.1	--	--	1.4	--	1.9	0.6 1,2,3-Trichlorobenzene	8.4
Screen 2	MW-991-009	--	--	--	--	--	--	--	0.5	--	7.7
Screen 3	MW-991-008	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-991-007	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-991-006	--	--	--	--	--	--	--	--	--	--
MW-24											
Screen 1	MW-991-005	**1.0**	1.5	--	--	--	--	--	0.8	--	14
Screen 2	MW-991-004	**30(E)**	3.0	1.0	--	--	1.5	--	6.6	--	580
Screen 3	MW-991-003	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-991-002	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-991-001	--	--	--	--	--	--	--	--	--	--

TABLE 3-3

SUMMARY OF VOLATILE ORGANIC COMPOUNDS AND PERCHLORATE DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1999

(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
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, compound also detected in laboratory method blanks.
E: Estimated concentration; results exceed calibration range.

TABLE 3-4

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

(concentrations in µg/L)

Values above state and/or Federal MCLs or action levels are 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	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
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	--
	Feb/Mar 1999	**4.5**	1.3	--	--	--	--	0.9	42	--	--

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	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
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
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	0.8(B)	--	--	--
Screen 2	Aug/Sep 1996	5.5	19	--	--	0.9	0.7	--	6.7	3.2(B) Acetone	NA
	Oct/Nov 1996	5.3	15	--	--	0.6	0.8	--	5.4	1.8 Acetone	NA
	Feb/Mar 1997	7.9	19	--	--	0.8	0.8	--	7.8	--	NA
	Jun/Jul 1997	4.0	5.7	--	--	--	0.5	--	3.4	--	51
	Sep/Oct 1997	4.0	8.0	0.5	0.6	--	0.5	--	3.5	--	34
	Jan/Feb 1998	1.9	2.7	0.6	--	--	--	--	1.8	--	30
	Apr/May 1998	2.8	4.3	0.7	0.5	--	--	--	3.1	--	41

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
	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**
	Feb/Mar 1999	**1.2**	4.1	0.6	0.5	--	--	--	2.5	--	**38**
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	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	0.7[b]	--	--	--
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	--	3.9(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.6 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	0.6[b]	--	--	--
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	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	0.6[b]	--	--	--
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]	--

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
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--
	Feb/Mar 1999	--	0.8	3.8	1.0	--	--	--	0.6	--	--
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**
	Feb/Mar 1999	**49**	**17**	0.6	--	--	0.9	2.0	7.2	--	**150**
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	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--

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
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	**5.7**	--	--	--	--	--	0.9	--	**39**
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**	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	0.9[b]	--	--	--
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	--	--
	Feb/Mar 1999	--	--	--	--	--	--	0.7[b]	1.1	--	--
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	--	--

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
	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	--	--
	Feb/Mar 1999	--	--	--	--	--	--	0.7(b)	--	--	--
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	--	--
	Feb/Mar 1999	--	--	--	--	--	--	0.7(b)	--	--	--
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	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	0.7(b)	--	--	--
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	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
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

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
	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
	Feb/Mar 1999	1.3	--	--	--	--	--	--	0.9	--	4.1
Screen 3	Aug/Sep 1996	4.5	--	--	--	--	--	--	1.3	--	NA
	Oct/Nov 1996	3.8	--	--	--	--	--	--	1.3	1.6 Acetone	NA
	Feb/Mar 1997	6.4	--	--	--	--	--	--	1.4	1.3(B) Acetone	NA
	Jun/Jul 1997	20	--	--	--	--	--	--	1.6	--	5.7
	Sep/Oct 1997	14	--	--	--	--	--	--	1.7	--	6.2
	Jan/Feb 1998	23E	--	--	--	--	--	--	2.3	--	5.9
	Apr/May 1998	25	--	--	--	--	--	--	2.0	--	6.9
	Jul/Aug 1998	35	--	--	--	--	--	--	2.2	--	6.6
	Oct/Nov 1998	27	--	--	--	--	--	--	2.2	--	6.9
	Feb/Mar 1999	23	--	--	--	--	--	--	--	--	--
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
	Feb/Mar 1999	4.5	--	--	--	--	--	--	1.2	--	7.0
Screen 5	Aug/Sep 1996	3.4	--	--	--	--	--	--	0.7	--	NA
	Oct/Nov 1996	1.3	--	--	--	--	--	--	--	1.5 Acetone	NA
	Feb/Mar 1997	1.7	--	--	--	--	--	--	0.5	--	NA
	Jun/Jul 1997	1.9	--	--	--	--	--	--	0.5	--	4.1
	Sep/Oct 1997	1.3	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	1.3	--	--	--	--	--	--	--	--	--
	Apr/May 1998	1.7	--	--	--	--	--	--	0.6	--	--
	Jul/Aug 1998	2.1	--	--	--	--	--	--	0.6	--	--
	Oct/Nov 1998	2.0	--	--	--	--	--	--	0.6	--	--
	Feb/Mar 1999	1.3	--	--	--	--	--	--	0.7	--	--
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

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
	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**
	Feb/Mar 1999	**9.4**	**28**	--	--	0.7	0.7	11	--	--	**98**
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
	Feb/Mar 1999	--	--	0.8	1.2	--	--	0.6(b)	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
	Feb/Mar 1999	--	0.9	1.6	0.7	--	--	0.6(b)	0.6	--	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
	Feb/Mar 1999	--	--	0.5	--	--	--	0.6(b)	0.5	--	5.9

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	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	0.6(b)	--	--	--
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	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
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**

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
	Oct/Nov 1998	**51**	**18**	1.0	--	**1.5**	1.6	1.4	29	1.0 1,1,1-Trichloroethane 1.1 1,1,1-Trichloroethane 13 Carbon disulfide	**220**
	Feb/Mar 1999	**67**	**20**	1.4	--	**1.1**	1.8	1.1	24	--	**790**
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	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
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	--	--
	Feb/Mar 1999	--	--	--	--	--	--	1.0(b)	3.9	--	--
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
	Feb/Mar 1999	--	1.6	--	--	--	--	--	3.8	--	4.2
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

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
	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
	Feb/Mar 1999	--	3.8	--	--	--	--	1.0(b)	1.8	--	9.8
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
	Feb/Mar 1999	--	4.9	--	--	--	--	--	2.1	--	6.4
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	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	3.0	0.8 Bromodichloromethane	--
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	--	--

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
	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	--	--
	Feb/Mar 1999	--	1.0	0.5	--	--	--	--	3.5	--	--
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**
	Feb/Mar 1999	**4.7**	1.2	2.3	--	--	--	--	1.1	--	**24**
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	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--

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
	Jan/Feb 1998	--	0.6	0.9	--	--	--	--	--	--	--
	Apr/May 1998	--	0.9	1.2	--	--	--	--	--	--	--
	Jul/Aug 1998	--	0.6	0.7	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	0.6	--	--	--	--	--	--	--	--
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
	Feb/Mar 1999	--	--	1.5	--	--	--	--	--	--	--
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	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	3.0	--	--
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	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	1.3	--	--	--	--	--	--	--
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*									

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
	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
	Feb/Mar 1999	--	--	--	--	--	--	--	2.2	--	4.9
Screen 2	Aug/Sep 1996	--	--	--	--	--	--	--	7.7	4.0(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	4.4	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	3.2	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	3.3	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	5.7	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	2.7	--	--
	Apr/May 1998	--	--	--	--	--	--	--	2.7	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	4.2	0.5 Dichlorobromomethane	--
	Oct/Nov 1998	--	--	--	--	--	--	--	3.6	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	4.2	--	--
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	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
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**
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--

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
	Apr/May 1998	--	--	--	--	--	--	--	--	--	**21**
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	8.2
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
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
	Feb/Mar 1999	--	**20**	0.5	--	--	--	--	1.8	--	14
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	--	--
	Feb/Mar 1999	--	--	0.8	--	--	--	--	--	--	4.1
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	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	1.0	--	--	--	--	--	--	4.1
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	--	--	--	--	--	--	--

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
	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	--
	Feb/Mar 1999	--	--	**3.8**	--	--	--	--	--	0.7 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
	Feb/Mar 1999	--	0.5	**7.7**	--	--	--	--	0.7	1.4 cis-1,2-Dichloroethene	4.2
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
	Feb/Mar 1999	--	0.6	3.6	1.0	--	--	1.3(b)	0.5	--	6.4
Screen 2	Sep/Oct 1997	--	--	--	--	--	--	--	--	0.8 Dichloromethane	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	4.9
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	0.6	--	--	--	--	1.4(b)	--	--	--
Screen 3	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	15
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	1.3(b)	--	--	--
Screen 4	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	1.3(b)	--	--	--

TABLE 3-4

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

(concentrations in µg/L)

Values above state and/or Federal MCLs or action levels are 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	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	1.3(b)	--	--	--
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**
	Feb/Mar 1999	**0.6**	**15**	1.1	--	--	1.4	--	1.9	0.06 1,2,3-Trichlorobenzene	8.4
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
	Feb/Mar 1999	--	--	--	--	--	--	--	0.5	--	7.7
Screen 3	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	1.7 Dichloromethane(b)	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
Screen 4	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	2.3 Dichloromethane(b)	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
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
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--

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-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
	Feb/Mar 1999	**1.0**	1.5	--	--	--	--	--	0.8	--	14
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**
	Feb/Mar 1999	**30E**	3.0	1.0	--	--	1.5	--	6.6	--	**580**
Screen 3	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
Screen 4	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--
Screen 5	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
	Jul/Aug 1998	--	--	--	--	--	--	--	--	--	--
	Oct/Nov 1998	--	--	--	--	--	--	--	--	--	--
	Feb/Mar 1999	--	--	--	--	--	--	--	--	--	--

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
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] 100 Bromodichloromethane[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, FEBRUARY-MARCH 1999

(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-991-079	--	--	--	--	1.99
MW-3						
Screen 1	MW-991-078	--	--	--	--	4.73
Screen 2	MW-991-077	--	--	--	--	2.15
Screen 3	MW-991-076	--	--	--	--	3.18
Screen 4	MW-991-075	--	--	--	--	3.53
Screen 5	MW-991-074	--	--	--	--	4.43
MW-4						
Screen 1	MW-991-073	--	--	--	--	0.98
Screen 2	MW-991-072	--	--	--	--	6.10
Screen 2 (DUP)	MW-991-071	--	--	--	--	6.10
Screen 3	MW-991-070	--	--	--	--	2.92
Screen 4	MW-991-069	--	--	--	--	3.33
Screen 5	MW-991-068	--	--	--	--	2.39
MW-5	MW-991-067	--	--	--	--	7.95
MW-6	MW-991-066	--	--	0.017	--	2.71
MW-7	MW-991-065	--	--	--	--	4.30
MW-8	MW-991-064	--	--	--	--	1.49
MW-9	MW-991-063	--	--	--	--	2.75
MW-10	MW-991-062	--	--	0.012	--	3.34
MW-10 DUP	MW-991-061	--	--	0.014	--	3.34
MW-11						
Screen 1	MW-991-060	--	--	--	--	1.64
Screen 2	MW-991-059	--	--	--	--	12.8
Screen 3	MW-991-058	--	--	--	--	2.63
Screen 4	MW-991-057	--	--	--	--	1.42
Screen 5	MW-991-056	--	--	--	--	4.13
MW-12						
Screen 1	MW-991-055	--	--	--	--	7.53
Screen 2	MW-991-054	--	--	--	--	2.45
Screen 2 (DUP)	MW-991-053	--	--	--	--	2.45
Screen 3	MW-991-052	--	--	--	--	4.62
Screen 4	MW-991-051	--	--	--	--	3.08
Screen 5	MW-991-050	--	--	--	--	5.03

TABLE 3-5

RESULTS OF METALS ANALYSIS OF GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1999

(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-991-049	--	--	0.027	0.018	1.0
MW-13 DUP	MW-991-048	--	--	0.030	0.019	1.0
MW-14						
Screen 1	MW-991-047	--	--	--	--	4.83
Screen 2	MW-991-046	--	--	--	--	4.72
Screen 3	MW-991-045	--	--	--	--	0.65
Screen 4	MW-991-044	--	--	--	--	2.08
Screen 5	MW-991-043	--	--	--	--	4.22
MW-15	MW-991-042	--	--	--	--	0.62
MW-16	MW-991-041	--	--	0.013	0.006	1.01
MW-17						
Screen 1	MW-991-040	--	--	--	--	1.54
Screen 2	MW-991-039	--	--	--	--	1.08
Screen 3	MW-991-038	--	--	--	--	6.28
Screen 4	MW-991-037	--	--	--	--	4.78
Screen 5	MW-991-036	--	0.007	--	--	12.4
MW-18						
Screen 1	MW-991-035	--	--	--	--	0.67
Screen 2	MW-991-034	--	0.005	--	--	2.71
Screen 3	MW-991-033	--	--	--	0.007	1.19
Screen 4	MW-991-032	--	--	--	--	2.67
Screen 5	MW-991-031	--	--	--	--	1.98
MW-19						
Screen 1	MW-991-030	--	--	--	--	4.99
Screen 2	MW-991-029	--	--	--	--	3.94
Screen 3	MW-991-028	--	--	--	--	4.11
Screen 4	MW-991-027	--	--	--	--	4.38
Screen 5	MW-991-026	--	--	--	--	4.37
MW-20						
Screen 1	MW-991-025	--	--	--	--	0.51
Screen 2	MW-991-024	--	--	--	--	0.79
Screen 3	MW-991-023	--	0.010	--	--	0.10
Screen 4	MW-991-022	--	--	--	--	0.83
Screen 5	MW-991-021	--	--	--	--	1.02

TABLE 3-5

RESULTS OF METALS ANALYSIS OF GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1999

(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-991-020	--	--	--	--	0.27
Screen 2	MW-991-019	--	--	--	--	0.04
Screen 3	MW-991-018	--	--	--	--	4.16
Screen 4	MW-991-017	--	--	--	--	13.1
Screen 5	MW-991-016	--	--	--	--	4.29
MW-22						
Screen 1	MW-991-015	--	--	--	--	20.1
Screen 2	MW-991-014	--	--	--	--	8.10
Screen 3	MW-991-013	--	--	--	--	5.19
Screen 4	MW-991-012	--	--	--	--	5.13
Screen 5	MW-991-011	--	--	--	--	2.63
MW-23						
Screen 1	MW-991-010	--	--	--	--	4.24
Screen 2	MW-991-009	--	--	--	--	2.53
Screen 3	MW-991-008	--	--	--	--	4.31
Screen 4	MW-991-007	--	--	--	--	5.07
Screen 5	MW-991-006	--	--	--	--	3.19
MW-24						
Screen 1	MW-991-005	--	--	--	--	7.63
Screen 2	MW-991-004	--	--	--	--	4.17
Screen 3	MW-991-003	0.006	--	0.001	--	34.8
Screen 4	MW-991-002	--	0.003	--	--	6.10
Screen 5	MW-991-001	--	--	--	--	5.70
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 3-5

RESULTS OF METALS ANALYSIS OF GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1999

(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-991-020	--	--	--	--	0.27
Screen 2	MW-991-019	--	--	--	--	0.04
Screen 3	MW-991-018	--	--	--	--	4.16
Screen 4	MW-991-017	--	--	--	--	13.1
Screen 5	MW-991-016	--	--	--	--	4.29
MW-22						
Screen 1	MW-991-015	--	--	--	--	20.1
Screen 2	MW-991-014	--	--	--	--	8.10
Screen 3	MW-991-013	--	--	--	--	5.19
Screen 4	MW-991-012	--	--	--	--	5.13
Screen 5	MW-991-011	--	--	--	--	2.63
MW-23						
Screen 1	MW-991-010	--	--	--	--	4.24
Screen 2	MW-991-009	--	--	--	--	2.53
Screen 3	MW-991-008	--	--	--	--	4.31
Screen 4	MW-991-007	--	--	--	--	5.07
Screen 5	MW-991-006	--	--	--	--	3.19
MW-24						
Screen 1	MW-991-005	--	--	--	--	7.63
Screen 2	MW-991-004	--	--	--	--	4.17
Screen 3	MW-991-003	0.006	--	0.001	--	34.8
Screen 4	MW-991-002	--	0.003	--	--	6.10
Screen 5	MW-991-001	--	--	--	--	5.70
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
	Feb/Mar 1999	--	--	--	--	1.9
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
	Feb/Mar 1999	--	--	--	--	4.7
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
	Feb/Mar 1999	--	--	--	--	2.1
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
	Feb/Mar 1999	--	--	--	--	3.2
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

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)
	Apr/May 1998	--	--	--	--	3.6
	Jul/Aug 1998	--	--	--	--	3.1
	Oct/Nov 1998	--	--	--	--	1.3
	Feb/Mar 1999	--	--	--	--	3.5
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
	Feb/Mar 1999	--	--	--	--	4.4
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
	Feb/Mar 1999	--	--	--	--	1.0
Screen 2	Aug/Sep 1996	--	--	0.023	--	3.8
	Oct/Nov 1996	--	--	0.014	--	4.2
	Feb/Mar 1997	--	--	0.011	--	4.5
	Jun/Jul 1997	--	--	0.013	--	2.7
	Sep/Oct 1997	--	--	0.012	--	3.5
	Jan/Feb 1998	--	--	--	--	4.8
	Apr/May 1998	--	--	--	--	1.8
	Jul/Aug 1998	--	--	0.011	--	4.9
	Oct/Nov 1998	--	--	0.010	--	3.4
	Feb/Mar 1999	--	--	--	--	6.1
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
	Feb/Mar 1999	--	--	--	--	2.9

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)
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
	Feb/Mar 1999	--	--	--	--	3.3
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
	Feb/Mar 1999	--	--	--	--	2.4
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
	Feb/Mar 1999	--	--	--	--	7.9
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
	Feb/Mar 1999	--	--	0.017	--	2.7
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

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)
	Jul/Aug 1998	--	--	--	--	4.7
	Oct/Nov 1998	--	--	--	--	1.2
	Feb/Mar 1999	--	--	--	--	4.3
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
	Feb/Mar 1999	--	--	--	--	1.5
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
	Feb/Mar 1999	--	--	--	--	2.8
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
	Feb/Mar 1999	--	--	0.014	--	3.3
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
	Feb/Mar 1999	--	--	--	--	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)
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
	Feb/Mar 1999	--	--	--	--	12.8
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
	Feb/Mar 1999	--	--	--	--	2.6
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
	Feb/Mar 1999	--	--	--	--	1.4
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
	Feb/Mar 1999	--	--	--	--	4.1
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

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)
	Apr/May 1998	--	--	0.010	--	4.8
	Jul/Aug 1998	--	--	--	--	5.0
	Oct/Nov 1998	--	--	--	--	7.4
	Feb/Mar 1999	--	--	--	--	7.5
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
	Feb/Mar 1999	--	--	--	--	2.5
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
	Feb/Mar 1999	--	--	--	--	4.6
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
	Feb/Mar 1999	--	--	--	--	3.1
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
	Feb/Mar 1999	--	--	--	--	5.0
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

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)
	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
	Feb/Mar 1999	--	--	0.030	0.019	1.0
MW-14						
Screen 1	Aug/Sep 1996	--	--	--	--	3.3
	Oct/Nov 1996	--	--	--	--	4.5
	Feb/Mar 1997	--	--	--	--	4.3
	Jun/Jul 1997	--	--	--	--	2.2
	Sep/Oct 1997	--	--	--	--	3.9
	Jan/Feb 1998	--	0.004	--	--	5.0
	Apr/May 1998	--	--	0.011	--	3.1
	Jul/Aug 1998	--	--	--	--	3.8
	Oct/Nov 1998	--	--	--	--	4.2
	Feb/Mar 1999	--	--	--	--	4.8
Screen 2	Aug/Sep 1996	--	--	--	--	4.4
	Oct/Nov 1996	--	--	--	--	3.8
	Feb/Mar 1997	--	--	--	--	4.8
	Jun/Jul 1997	--	--	--	--	5.0
	Sep/Oct 1997	--	--	--	--	3.2
	Jan/Feb 1998	--	0.003	--	--	4.8
	Apr/May 1998	--	--	--	--	4.9
	Jul/Aug 1998	--	--	--	--	4.8
	Oct/Nov 1998	--	--	--	--	4.3
	Feb/Mar 1999	--	--	--	--	4.7
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
	Feb/Mar 1999	--	--	--	--	0.7
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

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)
	Oct/Nov 1998	--	--	--	--	2.3
	Feb/Mar 1999	--	--	--	--	2.1
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
	Feb/Mar 1999	--	--	--	--	4.2
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
	Feb/Mar 1999	--	--	--	--	0.6
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
	Feb/Mar 1999	--	--	0.013	0.007	1.0
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
	Feb/Mar 1999	--	--	--	--	1.5

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 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
	Feb/Mar 1999	--	--	--	--	1.1
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
	Feb/Mar 1999	--	--	--	--	6.3
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
	Feb/Mar 1999	--	--	--	--	4.8
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
	Feb/Mar 1999	--	0.0074	--	--	12.4
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*				

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)
	Apr/May 1998	--	--	--	--	0.1
	Jul/Aug 1998	--	--	--	--	3.8
	Oct/Nov 1998	--	--	--	--	2.3
	Feb/Mar 1999	--	--	--	--	0.7
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
	Feb/Mar 1999	--	0.005	--	--	2.7
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
	Feb/Mar 1999	--	--	--	0.007	1.2
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
	Feb/Mar 1999	--	--	--	--	2.7
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
	Feb/Mar 1999	--	--	--	--	2.0

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-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
	Feb/Mar 1999	--	--	--	--	5.0
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
	Feb/Mar 1999	--	--	--	--	3.9
Screen 3	Aug/Sep 1996	--	--	NA	NA	3.0
	Oct/Nov 1996	--	--	--	--	5.0
	Feb/Mar 1997	--	--	--	--	4.9
	Jun/Jul 1997	--	--	--	--	4.9
	Sep/Oct 1997	--	--	--	--	2.0
	Jan/Feb 1998	--	--	--	--	4.1
	Apr/May 1998	--	--	--	--	2.4
	Jul/Aug 1998	--	--	--	--	3.9
	Oct/Nov 1998	--	--	--	--	3.4
	Feb/Mar 1999	--	--	--	--	4.1
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
	Feb/Mar 1999	--	--	--	--	4.4
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

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)
	Apr/May 1998	--	--	--	--	4.6
	Jul/Aug 1998	--	0.010	--	--	4.8
	Oct/Nov 1998	--	--	--	--	2.5
	Feb/Mar 1999	--	--	--	--	4.4
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
	Feb/Mar 1999	--	--	--	--	0.5
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
	Feb/Mar 1999	--	--	--	--	0.8
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
	Feb/Mar 1999	--	0.009	--	--	0.1
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
	Feb/Mar 1999	--	--	--	--	0.8

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)
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
	Feb/Mar 1999	--	--	--	--	1.0
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
	Feb/Mar 1999	--	--	--	--	0.3
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
	Feb/Mar 1999	--	--	--	--	0.04
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
	Feb/Mar 1999	--	--	--	--	4.2
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

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)
	Apr/May 1998	--	--	--	--	4.6
	Jul/Aug 1998	--	--	--	--	2.4
	Oct/Nov 1998	--	--	--	--	4.4
	Feb/Mar 1999	--	--	--	--	13.1
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
	Feb/Mar 1999	--	--	--	--	4.3
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
	Feb/Mar 1999	--	--	--	--	20.1
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
	Feb/Mar 1999	--	--	--	--	8.1
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
	Feb/Mar 1999	--	--	--	--	5.2
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
	Feb/Mar 1999	--	--	--	--	5.1
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
	Feb/Mar 1999	--	--	--	--	2.6

TABLE 3-6

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

(concentrations in mg/L)

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

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
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
	Feb/Mar 1999	--	--	--	--	4.2
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
	Feb/Mar 1999	--	--	--	--	2.5
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
	Feb/Mar 1999	--	--	--	--	4.3
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
	Feb/Mar 1999	--	--	--	--	5.1
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
	Feb/Mar 1999	--	--	--	--	3.2
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
	Feb/Mar 1999	--	--	--	--	7.6
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
	Feb/Mar 1999	--	--	--	--	4.2
Screen 3	Sep/Oct 1997	--	--	--	--	4.6
	Jan/Feb 1998	0.006	--	--	--	4.7
	Apr/May 1998	--	--	--	--	4.9
	Jul/Aug 1998	--	--	--	--	4.9

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)
	Oct/Nov 1998	--	--	--	--	7.8
	Feb/Mar 1999	0.006	--	0.0013	--	34.8
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
	Feb/Mar 1999	--	0.003	--	--	6.1
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
	Feb/Mar 1999	--	--	--	--	5.7
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 FROM GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY - MARCH 1999

(concentrations in mg/L)

Well	ANIONS					CATIONS					Measured	Measured
Number	CL	CO_3	HCO_3	NO_3-N	SO_4	Na	Mg	K	Ca	Fe	Alkalinity	pH
MW-1	10	0.53	205	0.98	29	22.3	13.9	2.80	43.7	--	168	7.6
MW-3												
Screen 1	7	0.59	182	0.56	23	17.3	12.9	2.41	37.6	1.10	149	7.7
Screen 2	11	1.16	225	0.79	41	20.5	19.4	2.7	47.8	0.44	185	7.9
Screen 3	22	2.95	181	--	39	41.5	14	3.01	26	0.13	149	8.4
Screen 4	12	2.99	183	0.21	15	46	8.7	1.96	18.6	0.54	151	8.4
Screen 5	10	23.7	145	--	3.7	67.4	--	--	2.53	1.10	127	9.4
MW-4												
Screen 1	9.8	0.24	183	0.87	24	19.3	12.9	2.42	39.6	0.36	150	7.3
Screen 2	65	0.26	202	7.5	81	27.3	27.7	2.37	80	0.62	166	7.3
Screen 3	24	2.69	165	1.4	9.9	33.7	12.8	1.93	23.6	0.22	136	8.4
Screen 4	16	1.91	185	4.6	7.5	39.7	10.7	1.79	27.5	0.72	152	8.2
Screen 5	8.4	1.62	198	1.2	17	35	9.37	1.8	34.2	0.23	163	8.1
MW-5	8.4	0.13	161	1.2	21	13.4	11.6	2.57	37.5	0.59	132	7.1
MW-6	110	0.17	267	10	160	30.9	43.6	2.32	133	0.13	219	7.0
MW-7	19	0.36	176	5.1	44	18.1	17.3	2.50	52.4	0.35	144	7.5
MW-8	8.6	0.20	156	0.77	23	13.4	11.9	2.17	36.7	0.10	128	7.3
MW-9	21	0.43	211	0.94	52	20.0	17.8	3.04	56.9	--	173	7.5
MW-10	46	0.14	218	9.2	84	18.6	27.3	2.66	82.5	0.11	179	7.0
MW-11												
Screen 1	16	1.21	235	0.5	39	24.7	19	3.12	50.9	0.12	193	7.9
Screen 2	14	1.57	192	0.12	33	22.4	16.9	2.91	40.2	0.75	158	8.1
Screen 3	12	2.5	193	--	22	25.5	13.3	2.14	37.5	0.27	159	8.3
Screen 4	10	2.78	170	--	11	24.9	11.9	2.23	25.8	0.21	140	8.4
Screen 5	11	2.0	154	--	18	47.2	2.18	1.1	21.5	0.6	127	8.3
MW-12												
Screen 1	10	0.28	173	0.92	26	18.9	14.4	2.73	34.5	0.89	142	7.4
Screen 2	15	0.75	230	2.0	43	24.2	17.8	3.02	55	0.24	189	7.7
Screen 3	19	1.6	195	0.21	39	25.1	15.6	2.79	43.4	0.54	160	8.1
Screen 4	15	1.17	226	1.4	32	22.9	14.3	2.19	56.2	0.18	186	7.9
Screen 5	14	1.68	205	1.0	19	34.6	10.7	1.92	38	0.17	169	8.1
MW-13	21	0.20	193	8.3	50	24.5	19	2.45	56.2	--	158	7.2

TABLE 4-1

SUMMARY OF WATER-CHEMISTRY RESULTS FROM GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY - MARCH 1999

(concentrations in mg/L)

Well	ANIONS					CATIONS					Measured	Measured
Number	CL	CO_3	HCO_3	NO_3-N	SO_4	Na	Mg	K	Ca	Fe	Alkalinity	pH
MW-14												
Screen 1	120	0.23	276	18.6	190	46.2	48.6	2.78	144	0.73	226	7.1
Screen 2	110	0.80	310	15.7	170	34.7	52.3	2.67	139	0.33	254	7.6
Screen 3	90	1.03	251	14.9	120	38.9	42.8	2.91	98.3	--	206	7.8
Screen 4	37	1.16	224	11	26	28.4	19	2.08	53.4	0.21	184	7.9
Screen 5	79	5.21	160	0.11	15	33.6	12.3	2.19	15.2	0.5	133	8.7
MW-15	20	0.34	206	2.2	49	20.4	17.7	2.94	55.2	--	169	7.4
MW-16	20	0.25	155	17	40	23.3	19.9	2.29	51.6	0.26	127	7.4
MW-17												
Screen 1	7.4	0.05	174	0.33	25	13.2	13	1.99	40.9	0.16	143	7.3
Screen 2	6.9	.036	177	1.0	28	13.6	13.8	2.08	41.2	0.30	150	7.5
Screen 3	9.0	1.24	191	1.0	30	18.6	16.4	1.85	40.1	1.2	157	8.0
Screen 4	11	1.03	200	1.6	35	27.2	12.5	1.46	45.6	0.76	164	7.9
Screen 5	11	1.31	201	1.7	34	27.4	12.4	1.53	43.9	1.6	165	8.0
MW-18												
Screen 1	5.5	0.37	178	0.78	28	13.1	12.8	2.15	41.0	--	146	7.5
Screen 2	12	0.55	213	1.3	41	18.3	16.2	2.48	50.0	0.13	175	7.6
Screen 3	13	1.58	243	1.0	40	20.3	17.4	2.68	57.8	--	200	8.0
Screen 4	11	2.91	178	0.84	26	32	11.2	1.38	29.4	0.17	147	8.4
Screen 5	12	1.81	176	0.31	5.5	49.3	2.17	1.52	13.3	0.17	145	8.2
MW-19												
Screen 1	4.4	0.38	145	0.29	18	11.4	10.5	2.03	31.5	5.7	119	7.6
Screen 2	25	0.13	202	4.8	52	15.5	21.1	1.74	58.3	0.91	166	7.0
Screen 3	95	1.0	308	9.9	110	31.3	40.1	2.79	115	1.5	253	7.7
Screen 4	17	4.55	176	2.2	36	25	18	1.93	33.4	0.52	146	8.6
Screen 5	73	1.34	206	4.3	71	32.2	30.1	2.48	60.6	0.29	169	8.0
MW-20												
Screen 1	49	0.52	200	12	130	21.2	4	3.24	93	--	164	7.6
Screen 2	14	1.17	180	2.7	34	14.8	17.5	2.04	43	--	148	8.0
Screen 3	41	6.12	188	1.2	29	62.8	14	2.24	16.9	--	156	8.7
Screen 4	11	4.19	162	--	22	60.3	2.89	--	10.3	--	134	8.6
Screen 5	8.6	6.85	167	--	24	56.9	3.47	1.57	13.4	--	139	8.8

TABLE 4-1

SUMMARY OF WATER-CHEMISTRY RESULTS FROM GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY - MARCH 1999

(concentrations in mg/L)

Well	ANIONS					CATIONS					Measured	Measured
Number	CL	CO_3	HCO_3	NO_3-N	SO_4	Na	Mg	K	Ca	Fe	Alkalinity	pH
MW-21												
Screen 1	75	0.11	204	15	100	29.1	31.3	1.92	94.5	--	167	6.9
Screen 2	130	0.41	313	7.8	150	48.6	42.8	2.75	128	0.15	257	7.3
Screen 3	95	0.64	312	10	94	38.4	36.6	2.88	115	0.123	256	7.5
Screen 4	50	0.39	237	8.8	47	26.9	24.1	2.22	75.9	0.3	194	7.4
Screen 5	65	1.06	259	10	81	32.5	30.6	2.61	91.9	1.6	213	7.8
MW-22												
Screen 1	120	0.29	277	12	170	31.5	48	2.6	138	1.9	227	7.2
Screen 2	59	0.71	219	9.4	59	30.6	26.5	2.26	72.4	0.62	180	7.7
Screen 3	30	1.2	184	9.0	21	31.8	14.3	1.8	45.4	0.47	151	8.0
Screen 4	12	0.87	168	4.9	6.9	25.7	9.78	1.51	33.2	1.06	138	7.9
Screen 5	7.7	10.4	127	--	48	72	--	--	4.89	.034	108	9.1
MW-23												
Screen 1	100	0.17	254	14	140	32.7	41.4	2.57	118	1.03	208	7.0
Screen 2	110	0.31	238	15	150	33.3	40.4	2.54	117	0.54	195	7.3
Screen 3	29	0.73	177	10	17	27.3	15.3	1.75	47	0.55	145	7.8
Screen 4	13	0.87	168	6.0	6.0	26.1	10.6	1.66	32.2	0.29	138	7.9
Screen 5	24	57.4	222	--	32	110	1.13	2.58	6.24	0.13	201	9.6
MW-24												
Screen 1	9.4	0.96	186	1.3	32	16.3	16.5	2.43	41.7	0.95	153	7.9
Screen 2	27	3.21	156	2.8	14	38.8	10.9	2.58	24.6	1.1	129	8.5
Screen 3	26	0.81	197	2.0	17	37.8	12.2	1.90	36.2	5.2	162	7.8
Screen 4	12	7.09	173	2.8	7.1	41.2	9.987	2.10	18.0	0.53	144	8.8
Screen 5	8.9	1.10	213	1.2	21	38.2	1.71	1.71	36.1	0.75	175	7.9
Detection Limit	1	0.001	0.001	0.1	2	1	1	1	1	0.1	2	

TABLE 4-2

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

Well/Screen Number	Water Type[1]
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
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
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

Note: Water type denoted by more than one number (i.e., 1/2) represent blends of the listed basic types, with the more dominant type listed first.

D:\JPL\991\991-4tbl

TABLE 4-3

SUMMARY OF QUALITY CONTROL ANALYSIS OF WATER-CHEMISTRY DATA FROM GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1999

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

Well Number	Total Anion	Total Cations	Total Ions	Charge Balance Error[1]	Measured TDS	Calculated TDS	Measured TDS/ Calculated TDS[2]
MW-1	4.32	4.29	8.61	0.3	260	224	1.2
MW-3							
Screen 1	3.70	3.76	7.46	0.8	200	192	1.0
Screen 2	4.92	4.95	9.87	0.3	290	255	1.1
Screen 3	4.41	4.33	8.74	0.9	240	238	1.0
Screen 4	3.69	3.70	7.39	0.1	220	196	1.1
Screen 5	2.90	3.06	5.96	2.7	210	180	1.2
MW-4							
Screen 1	3.84	3.94	7.78	1.3	210	199	1.1
Screen 2	7.38	7.53	14.91	1.0	410	391	1.0
Screen 3	3.70	3.75	7.45	0.7	210	191	1.1
Screen 4	3.98	4.03	8.01	0.6	230	201	1.1
Screen 5	3.94	4.06	8.00	1.5	240	206	1.2
MW-5	3.40	3.48	6.88	1.2	200	176	1.1
MW-6	11.50	11.60	23.10	0.4	680	621	1.1
MW-7	4.70	4.98	9.68	2.9	270	246	1.1
MW-8	3.34	3.43	6.77	1.3	200	174	1.2
MW-9	5.20	5.26	10.46	0.6	320	276	1.2
MW-10	7.28	7.25	14.53	0.2	400	378	1.1
MW-11							
Screen 1	5.16	5.26	10.42	1.0	300	270	1.1
Screen 2	4.25	4.45	8.70	2.3	270	226	1.2
Screen 3	3.98	4.13	8.11	1.8	230	210	1.1
Screen 4	3.31	3.41	6.72	1.5	190	172	1.1
Screen 5	3.23	3.33	6.56	1.5	180	179	1.0
MW-12							
Screen 1	3.73	3.80	7.53	0.9	210	194	1.1
Screen 2	5.24	5.34	10.58	0.9	290	274	1.1
Screen 3	4.56	4.62	9.18	0.7	260	243	1.1
Screen 4	4.92	5.04	9.96	1.2	280	256	1.1
Screen 5	4.56	4.33	8.89	2.6	240	222	1.1
MW-13	5.39	5.5	10.89	1.01	300	277	1.1

TABLE 4-3

SUMMARY OF QUALITY CONTROL ANALYSIS OF WATER-CHEMISTRY DATA FROM GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1999

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

Well Number	Total Anion	Total Cations	Total Ions	Charge Balance Error[1]	Measured TDS	Calculated TDS	Measured TDS/ Calculated TDS[2]
MW-14							
Screen 1	13.20	13.30	26.50	0.4	710	707	1.0
Screen 2	12.80	12.80	25.60	0.0	700	678	1.0
Screen 3	10.20	10.20	20.40	0.0	540	532	1.0
Screen 4	5.27	5.52	10.79	2.3	330	288	1.1
Screen 5	3.20	3.29	6.49	1.4	180	242	0.7
MW-15	5.12	5.18	10.30	0.6	330	269	1.2
MW-16	5.15	5.29	10.44	1.3	290	251	1.2
MW-17							
Screen 1	3.61	3.74	7.35	1.8	220	188	1.2
Screen 2	3.75	3.84	7.59	1.2	220	194	1.1
Screen 3	4.09	4.21	8.30	1.4	210	213	1.0
Screen 4	4.43	4.53	8.96	1.1	250	234	1.1
Screen 5	4.44	4.45	8.89	0.1	250	234	1.1
MW-18							
Screen 1	3.71	3.73	7.44	0.3	240	191	1.3
Screen 2	4.79	4.69	9.48	1.1	290	247	1.2
Screen 3	5.27	5.27	10.54	0.0	320	273	1.2
Screen 4	3.85	3.82	7.67	0.4	220	202	1.1
Screen 5	3.38	3.27	6.65	1.7	210	173	1.2
MW-19							
Screen 1	2.90	2.99	5.89	1.5	170	155	1.1
Screen 2	5.45	5.37	10.82	0.7	300	279	1.1
Screen 3	10.70	10.50	21.20	0.9	620	558	1.1
Screen 4	4.31	4.29	8.60	0.2	250	225	1.1
Screen 5	7.23	6.97	14.20	1.8	400	377	1.1
MW-20							
Screen 1	8.23	8.07	16.30	1.0	420	411	1.0
Screen 2	4.26	4.29	8.55	0.4	240	218	1.1
Screen 3	4.97	4.78	9.75	1.9	300	266	1.1
Screen 4	3.45	3.37	6.82	1.2	200	190	1.1
Screen 5	3.52	3.47	6.99	0.7	210	197	1.1

TABLE 4-3

SUMMARY OF QUALITY CONTROL ANALYSIS OF WATER-CHEMISTRY DATA FROM GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1999

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

Well Number	Total Anion	Total Cations	Total Ions	Charge Balance Error[1]	Measured TDS	Calculated TDS	Measured TDS/ Calculated TDS[2]
MW-21							
Screen 1	8.61	8.62	17.23	0.1	500	447	1.1
Screen 2	12.50	12.10	24.60	1.6	730	664	1.1
Screen 3	10.50	10.50	21.00	0.0	610	546	1.1
Screen 4	6.90	7.00	13.90	0.7	410	352	1.2
Screen 5	8.50	8.59	17.09	0.5	500	444	1.1
MW-22							
Screen 1	12.30	12.30	24.60	0.0	670	660	1.0
Screen 2	7.16	7.19	14.35	0.2	440	368	1.2
Screen 3	4.95	4.88	9.83	0.7	310	245	1.3
Screen 4	3.59	3.62	7.21	0.4	200	179	1.1
Screen 5	3.38	3.45	6.83	1.0	230	205	1.1
MW-23							
Screen 1	10.90	10.80	21.70	0.5	570	575	1.0
Screen 2	11.20	10.70	21.90	2.3	600	586	1.0
Screen 3	4.80	4.84	9.64	0.4	270	236	1.1
Screen 4	3.68	3.66	7.34	0.3	200	179	1.1
Screen 5	5.36	5.25	10.61	1.0	300	343	0.9
MW-24							
Screen 1	4.08	4.21	8.29	1.6	220	213	1.0
Screen 2	3.83	3.88	7.71	0.6	210	202	1.0
Screen 3	4.47	4.51	8.98	0.4	240	236	1.0
Screen 4	3.57	3.57	7.14	0.0	200	186	1.1
Screen 5	4.27	4.24	8.51	0.4	230	215	1.1

1 Expressed in percent: ideal error range between 0 and 5 percent. Values between 5 and 10 percent considered acceptable for intended use.

2 Ideal values range between 0.8 and 1.2.

TABLE 5-1

GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS

February 19, 1999

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-1		2/19/99	23.26	1116.69	1093.43
MW-3	1 (top)	2/19/99	100.09	1100.34	1000.25
	2	2/19/99	106.04	1100.34	994.30
	3	2/19/99	104.27	1100.34	996.07
	4	2/19/99	116.58	1100.34	983.76
	5	2/19/99	124.74	1100.34	975.60
MW-4	1 (top)	2/19/99	79.88	1082.84	1002.96
	2	2/19/99	87.16	1082.84	995.68
	3	2/19/99	87.34	1082.84	995.50
	4	2/19/99	88.74	1082.84	994.10
	5	2/19/99	98.07	1082.84	984.77
MW-5		2/19/99	71.11	1071.62	1000.51
MW-6		2/19/99	181.86	1188.54	1006.68
MW-7		2/19/99	NA	1212.90	NA
MW-8		2/19/99	137.72	1139.55	1001.83
MW-9		2/19/99	19.87	1106.06	1086.19
MW-10		2/19/99	89.46	1087.73	998.27
MW-11	1 (top)	2/19/99	113.46	1139.30	1025.84
	2	2/19/99	136.70	1139.30	1002.60
	3	2/19/99	142.70	1139.30	996.60
	4	2/19/99	146.86	1139.30	992.44
	5	2/19/99	156.94	1139.30	982.36
MW-12	1 (top)	2/19/99	91.24	1102.14	1010.90
	2	2/19/99	104.25	1102.14	997.89
	3	2/19/99	105.27	1102.14	996.87
	4	2/19/99	107.38	1102.14	994.76
	5	2/19/99	115.81	1102.14	986.33
MW-13		2/19/99	184.21	1183.49	999.28

TABLE 5-1

GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS

February 19, 1999

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-14	1 (top)	2/19/99	164.58	1173.47	1008.89
	2	2/19/99	164.10	1173.47	1009.37
	3	2/19/99	163.39	1173.47	1010.08
	4	2/19/99	163.22	1173.47	1010.25
	5	2/19/99	163.04	1173.47	1010.43
MW-15		2/19/99	30.50	1120.68	1090.18
MW-16		2/19/99	NA	1236.29	NA
MW-17	1 (top)	2/19/99	200.50	1191.21	990.71
	2	2/19/99	203.43	1191.21	987.78
	3	2/19/99	208.28	1191.21	982.93
	4	2/19/99	210.44	1191.21	980.77
	5	2/19/99	218.16	1191.21	973.05
MW-18	1 (top)	2/19/99	241.89	1225.41	983.52
	2	2/19/99	241.06	1225.41	984.35
	3	2/19/99	238.44	1225.41	986.97
	4	2/19/99	246.66	1225.41	978.75
	5	2/19/99	260.67	1225.41	964.74
MW-19	1 (top)	2/19/99	158.37	1142.94	984.57
	2	2/19/99	157.89	1142.94	985.05
	3	2/19/99	156.96	1142.94	985.98
	4	2/19/99	160.73	1142.94	982.21
	5	2/19/99	160.85	1142.94	982.09
MW-20	1 (top)	2/19/99	193.79	1165.05	971.26
	2	2/19/99	191.87	1165.05	973.18
	3	2/19/99	192.15	1165.05	972.90
	4	2/19/99	214.14	1165.05	950.91
	5	2/19/99	194.91	1165.05	970.14

TABLE 5-1

GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS

February 19, 1999

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-21	1 (top)	2/19/99	59.20	1059.10	999.90
	2	2/19/99	56.44	1059.10	1002.66
	3	2/19/99	56.00	1059.10	1003.10
	4	2/19/99	56.84	1059.10	1002.26
	5	2/19/99	56.76	1059.10	1002.34
MW-22	1 (top)	2/19/99	176.50	1176.98	1000.48
	2	2/19/99	172.56	1176.98	1004.42
	3	2/19/99	172.33	1176.98	1004.65
	4	2/19/99	176.28	1176.98	1000.70
	5	2/19/99	179.51	1176.98	997.47
MW-23	1 (top)	2/19/99	109.76	1108.84	999.08
	2	2/19/99	108.66	1108.84	1000.18
	3	2/19/99	108.41	1108.84	1000.43
	4	2/19/99	112.50	1108.84	996.34
	5	2/19/99	113.63	1108.84	995.21
MW-24	1 (top)	2/19/99	201.30	1200.94	999.64
	2	2/19/99	201.72	1200.94	999.22
	3	2/19/99	201.68	1200.94	999.26
	4	2/19/99	205.68	1200.94	995.26
	5	2/19/99	209.60	1200.94	991.34

TABLE 5-2

GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS

March 24, 1999

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-1		3/24/99	23.87	1116.69	1092.82
MW-3	1 (top)	3/24/99	97.14	1100.34	1003.20
	2	3/24/99	101.48	1100.34	998.86
	3	3/24/99	101.70	1100.34	998.64
	4	3/24/99	108.38	1100.34	991.96
	5	3/24/99	113.18	1100.34	987.16
MW-4	1 (top)	3/24/99	77.14	1082.84	1005.70
	2	3/24/99	82.70	1082.84	1000.14
	3	3/24/99	82.75	1082.84	1000.09
	4	3/24/99	83.48	1082.84	999.36
	5	3/24/99	90.40	1082.84	992.44
MW-5		3/24/99	68.08	1071.62	1003.54
MW-6		3/24/99	178.05	1188.54	1010.49
MW-7		3/24/99	NA	1212.90	NA
MW-8		3/24/99	133.78	1139.55	1005.77
MW-9		3/24/99	19.97	1106.06	1086.09
MW-10		3/24/99	85.38	1087.73	1002.35
MW-11	1 (top)	3/24/99	110.66	1139.30	1028.64
	2	3/24/99	131.74	1139.30	1007.56
	3	3/24/99	136.65	1139.30	1002.65
	4	3/24/99	138.21	1139.30	1001.09
	5	3/24/99	148.60	1139.30	990.70
MW-12	1 (top)	3/24/99	90.62	1102.14	1011.52
	2	3/24/99	100.16	1102.14	1001.98
	3	3/24/99	100.93	1102.14	1001.21
	4	3/24/99	102.02	1102.14	1000.12
	5	3/24/99	108.35	1102.14	993.79
MW-13		3/24/99	179.50	1183.49	1003.99

TABLE 5-2

GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS

March 24, 1999

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-14	1 (top)	3/24/99	160.59	1173.47	1012.88
	2	3/24/99	160.21	1173.47	1013.26
	3	3/24/99	159.58	1173.47	1013.89
	4	3/24/99	159.49	1173.47	1013.98
	5	3/24/99	159.33	1173.47	1014.14
MW-15		3/24/99	30.10	1120.68	1090.58
MW-16		3/24/99	232.75	1236.29	1003.54
MW-17	1 (top)	3/24/99	194.91	1191.21	996.30
	2	3/24/99	198.40	1191.21	992.81
	3	3/24/99	202.12	1191.21	989.09
	4	3/24/99	202.15	1191.21	989.06
	5	3/24/99	207.08	1191.21	984.13
MW-18	1 (top)	3/24/99	235.69	1225.41	989.72
	2	3/24/99	235.14	1225.41	990.27
	3	3/24/99	232.95	1225.41	992.46
	4	3/24/99	238.00	1225.41	987.41
	5	3/24/99	248.13	1225.41	977.28
MW-19	1 (top)	3/24/99	154.36	1142.94	988.58
	2	3/24/99	153.35	1142.94	989.59
	3	3/24/99	152.16	1142.94	990.78
	4	3/24/99	153.32	1142.94	989.62
	5	3/24/99	153.36	1142.94	989.58
MW-20	1 (top)	3/24/99	189.48	1165.05	975.57
	2	3/24/99	187.61	1165.05	977.44
	3	3/24/99	186.78	1165.05	978.27
	4	3/24/99	199.58	1165.05	965.47
	5	3/24/99	190.08	1165.05	974.97

TABLE 5-2

GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS

March 24, 1999

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-21	1 (top)	3/24/99	55.73	1059.10	1003.37
	2	3/24/99	53.13	1059.10	1005.97
	3	3/24/99	52.69	1059.10	1006.41
	4	3/24/99	53.45	1059.10	1005.65
	5	3/24/99	53.52	1059.10	1005.58
MW-22	1 (top)	3/24/99	171.79	1176.98	1005.19
	2	3/24/99	168.53	1176.98	1008.45
	3	3/24/99	168.32	1176.98	1008.66
	4	3/24/99	171.34	1176.98	1005.64
	5	3/24/99	174.04	1176.98	1002.94
MW-23	1 (top)	3/24/99	104.92	1108.84	1003.92
	2	3/24/99	104.00	1108.84	1004.84
	3	3/24/99	103.79	1108.84	1005.05
	4	3/24/99	106.71	1108.84	1002.13
	5	3/24/99	107.35	1108.84	1001.49
MW-24	1 (top)	3/24/99	196.44	1200.94	1004.50
	2	3/24/99	197.48	1200.94	1003.46
	3	3/24/99	197.40	1200.94	1003.54
	4	3/24/99	200.11	1200.94	1000.83
	5	3/24/99	203.12	1200.94	997.82

FIGURES

JPLF1-1.DWG

Jet Propulsion Laboratory

MW-1
MW-7
MW-16
MW-11
MW-15
MW-9
MW-24
MW-6
MW-22
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

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.

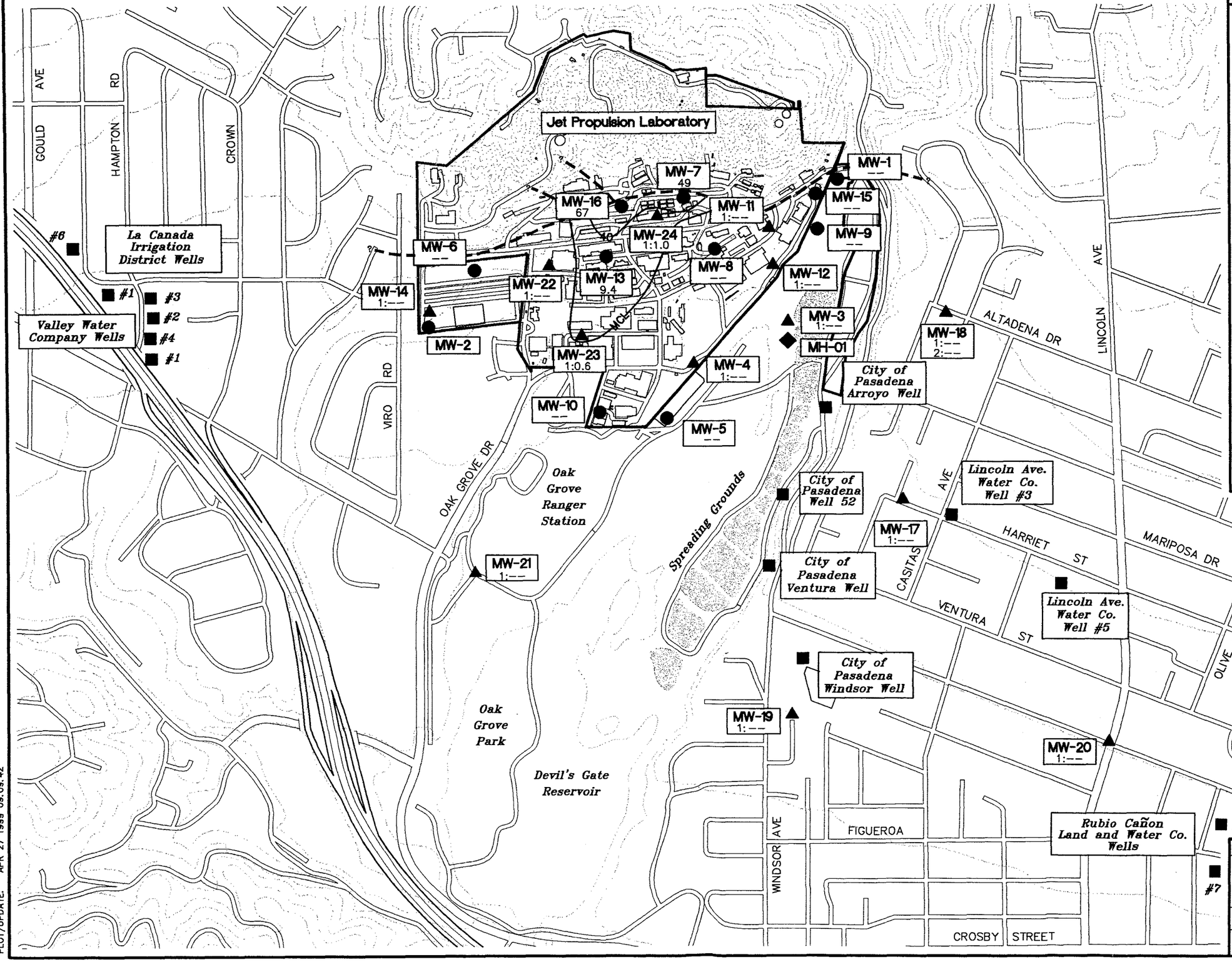
FIGURE 1-1

LOCATIONS OF JPL GROUNDWATER MONITORING WELLS AND NEARBY MUNICIPAL PRODUCTION WELLS

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

9-25-98



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 (0.5µ g/L)

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

800 400 0 800

SCALE IN FEET

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

FIGURE 3-1

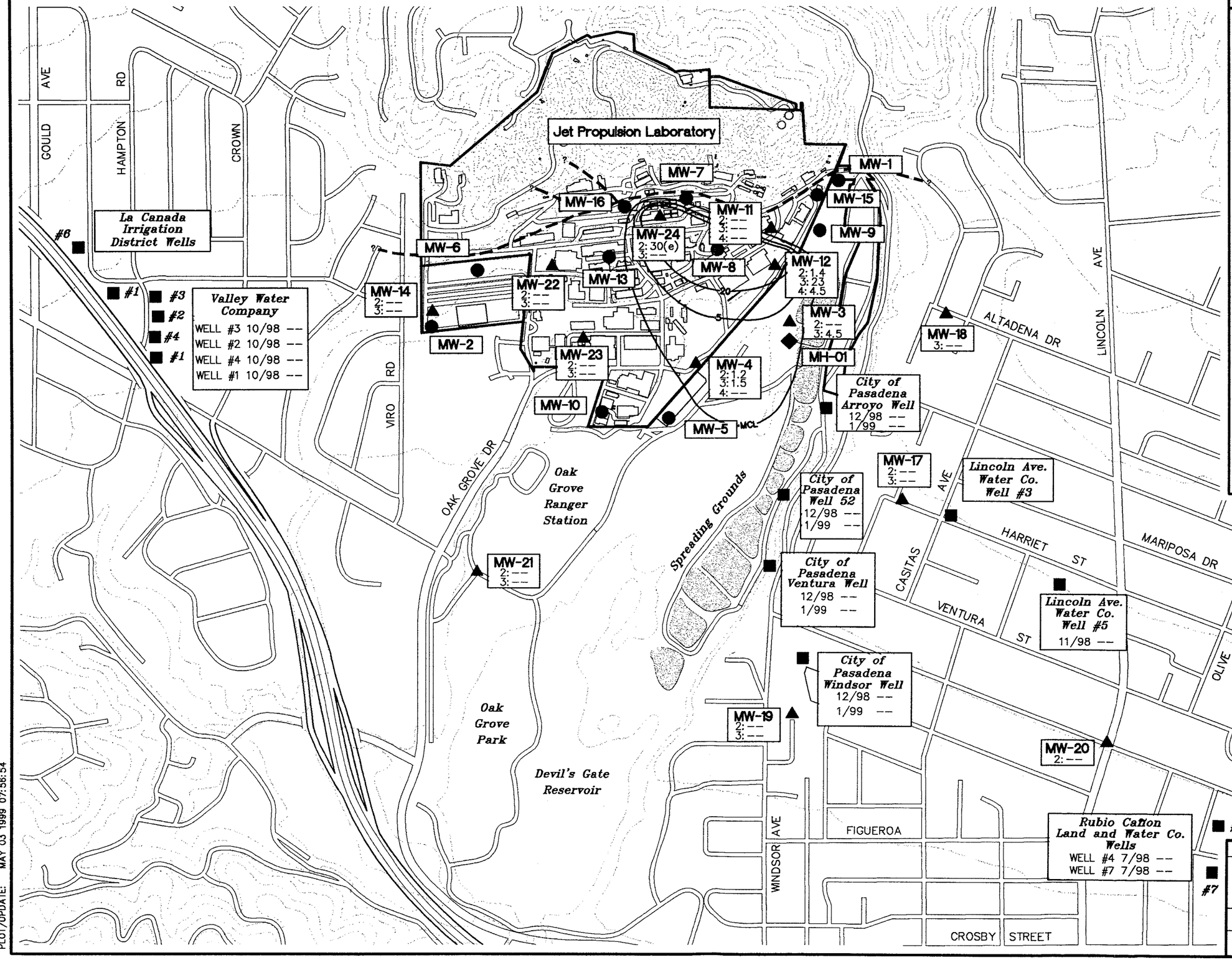
CONTOURS OF CARBON TETRACHLORIDE CONCENTRATIONS IN AQUIFER LAYER 1

FEBRUARY-MARCH 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I: \1572-JPL\DWG\OU1-OU3\QUARTER\991\FIG3-1.DWG
PLOT/UPDATE: APR 27 1999 09:09:42



Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi—Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- 1: Screen Number for Wells in this Aquifier Layer
- -- Not Detected
- Detection Limit 0.5 µg/L
- JPL Thrust Fault
- JPL Property Line
- 10 Concentration Contour (µg/L)
- MCL Maximum Contaminant Level (0.5 µg/L)

NOTES:

1. Where constituents were detected in multiple screens, the higher concentration has been contoured.
2. Values for production wells based on most recent data available.

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

FEBRUARY—MARCH 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I:\1572-JPL\DWG\OU1-OU3\QUARTER\991\FIG3-2.DWG
PLOT/UPDATE: MAY 03 1999 07:56:54

Jet Propulsion Laboratory

MW-1 --
MW-2
MW-3 1:--
MW-4 1:--
MW-5 --
MW-6 0.8
MW-7 17
MW-8 --
MW-9 --
MW-10 5.7
MW-11 1:--
MW-12 1:--
MW-13 29
MW-14 --
MW-15 --
MW-16 20
MW-17 1:--
MW-18 1:-- 2:--
MW-19 1:--
MW-20 1:--
MW-21 1:20
MW-22 1:0.6
MW-23 1:15
MW-24 1:1.5
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

20
MCL
0.5
?

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

City of Pasadena Well 52
City of Pasadena Ventura Well
City of Pasadena Windsor Well

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

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

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 (5.0 µg/L)

NOTES:

1. Where constituents were detected in multiple screens, the higher concentration has been contoured.
2. Values for production wells based on most recent data available.

N

800 400 0 800
SCALE IN FEET

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

FIGURE 3-4

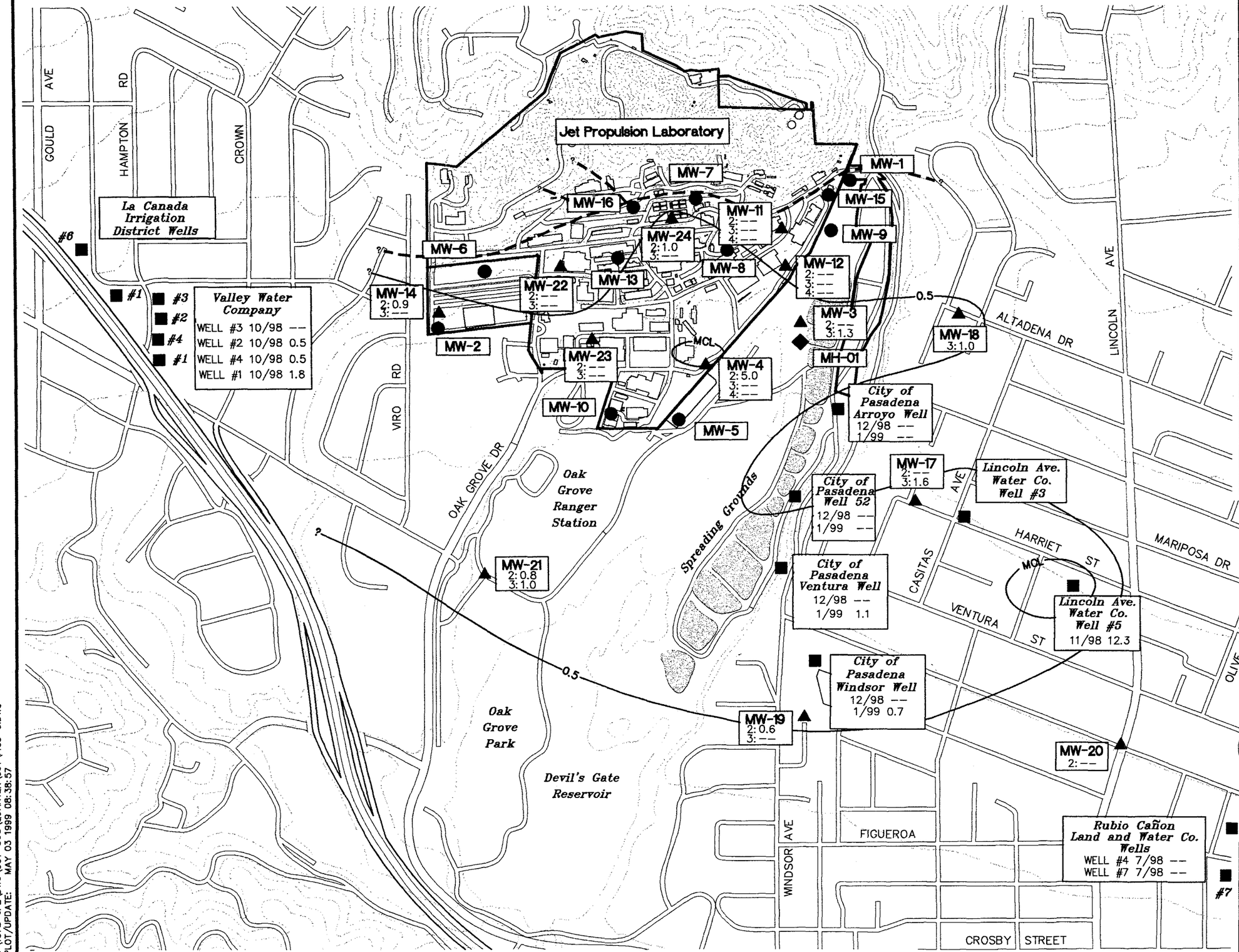
CONTOURS OF TRICHLOROETHENE CONCENTRATIONS IN AQUIFER LAYER 1

FEBRUARY-MARCH 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I:\1572-JPL\DWG\OU1-OU3\QUARTER\991\FIG3-4.DWG
PLOT/UPDATE: MAY 04 1999 08:25:37



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)

NOTES:

1. Where constituents were detected in multiple screens, the higher concentration has been contoured.
2. Values for production wells based on most recent data available.

N

800 400 0 800

SCALE IN FEET

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

FIGURE 3-5

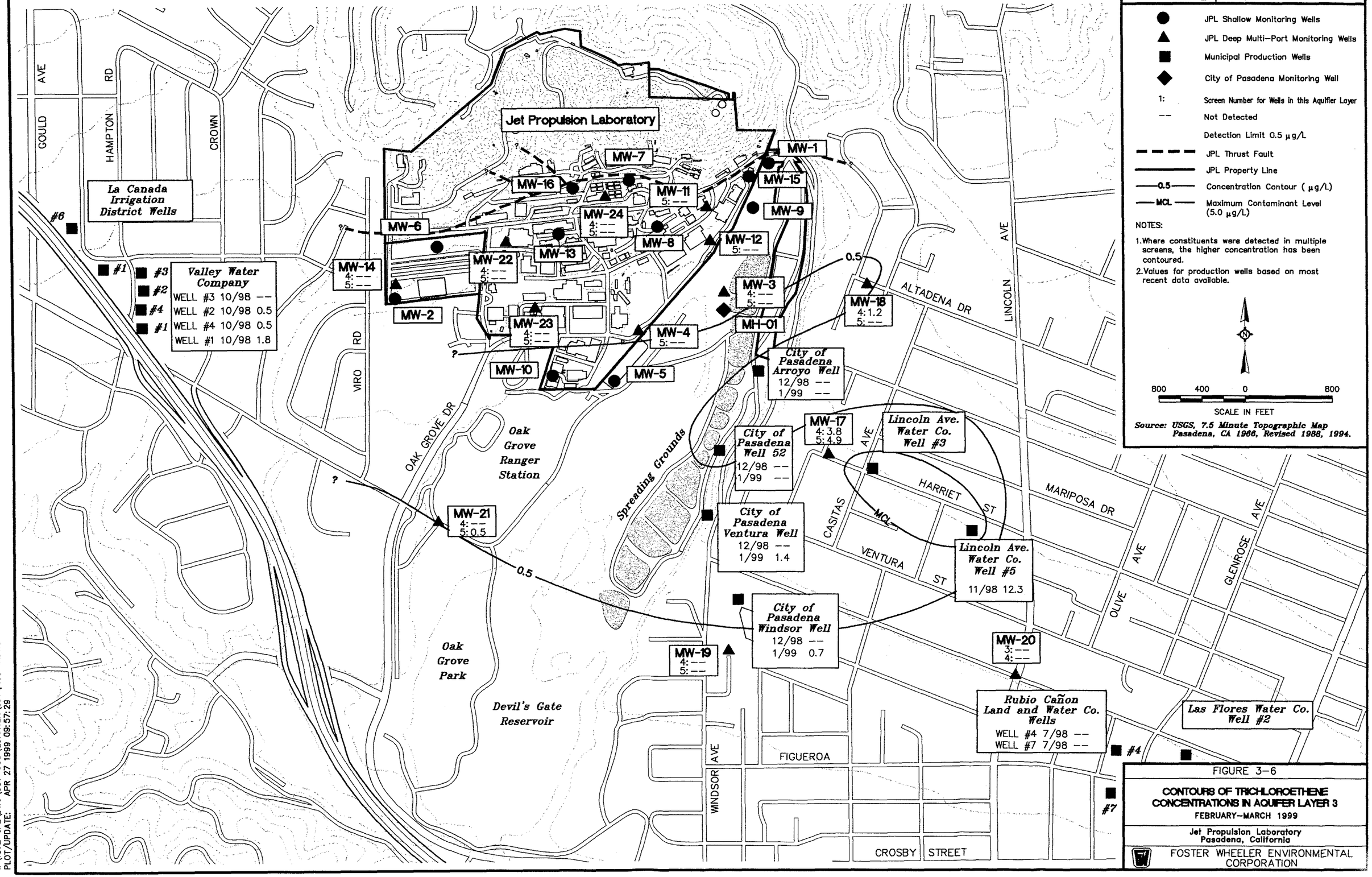
CONTOURS OF TRICHLOROETHENE CONCENTRATIONS IN AQUIFER LAYER 2

FEBRUARY–MARCH 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I:\1572-JPL\DWG\OU1-OU3\QUARTER\991\FIG3-5.DWG
PLOT/UPDATE: MAY 03 1999 08:38:57



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)

NOTES:

1. Where constituents were detected in multiple screens, the higher concentration has been contoured.
2. Values for production wells based on most recent data available.

N

800 400 0 800

SCALE IN FEET

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

FIGURE 3-6

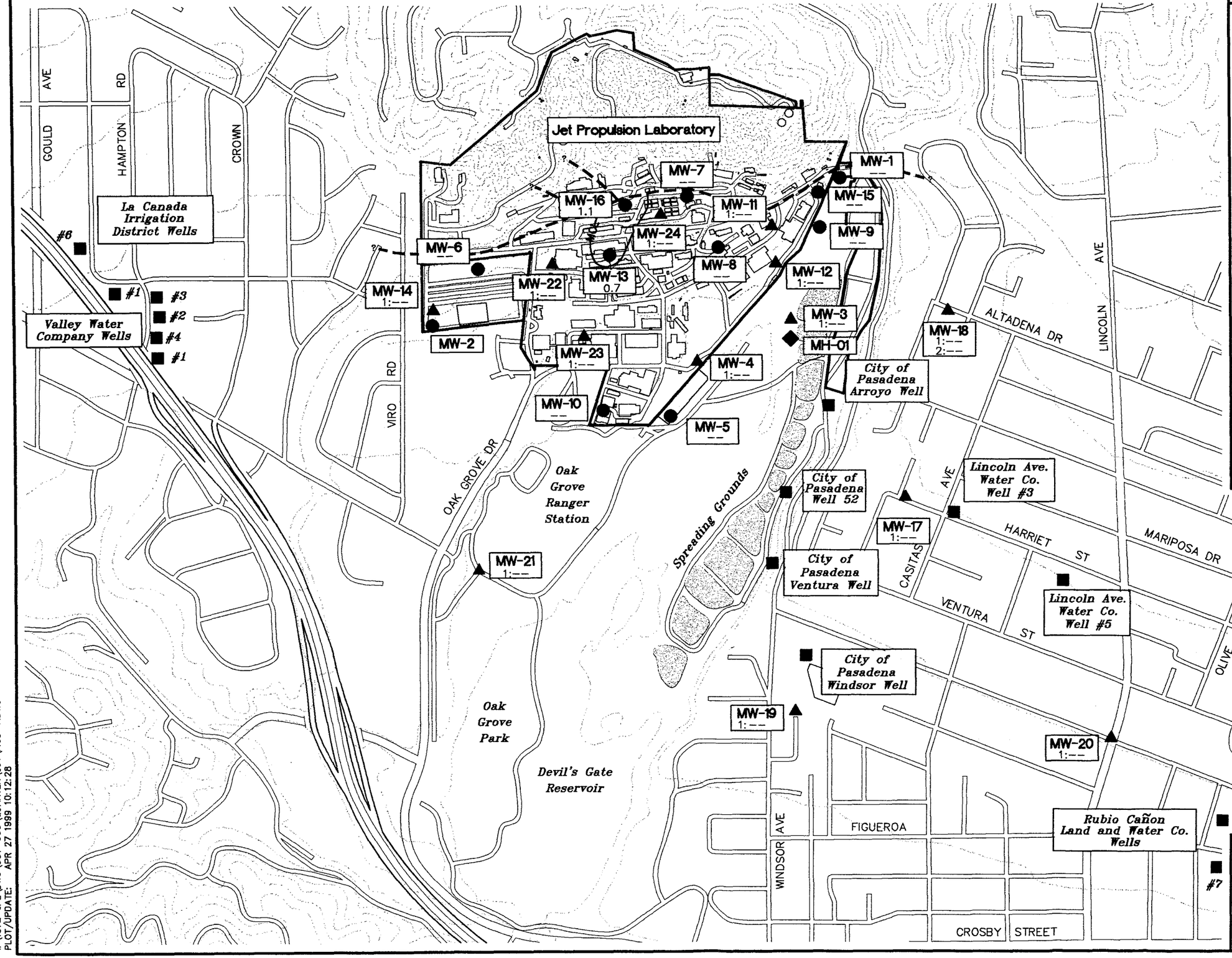
CONTOURS OF TRICHLOROETHENE CONCENTRATIONS IN AQUIFER LAYER 3

FEBRUARY-MARCH 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I: \1572-JPL\DWG\OU1-OU3\QUARTER\991\FIG3-6.DWG
PLOT/UPDATE: APR 27 1999 09:57:29



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 (0.5µ 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

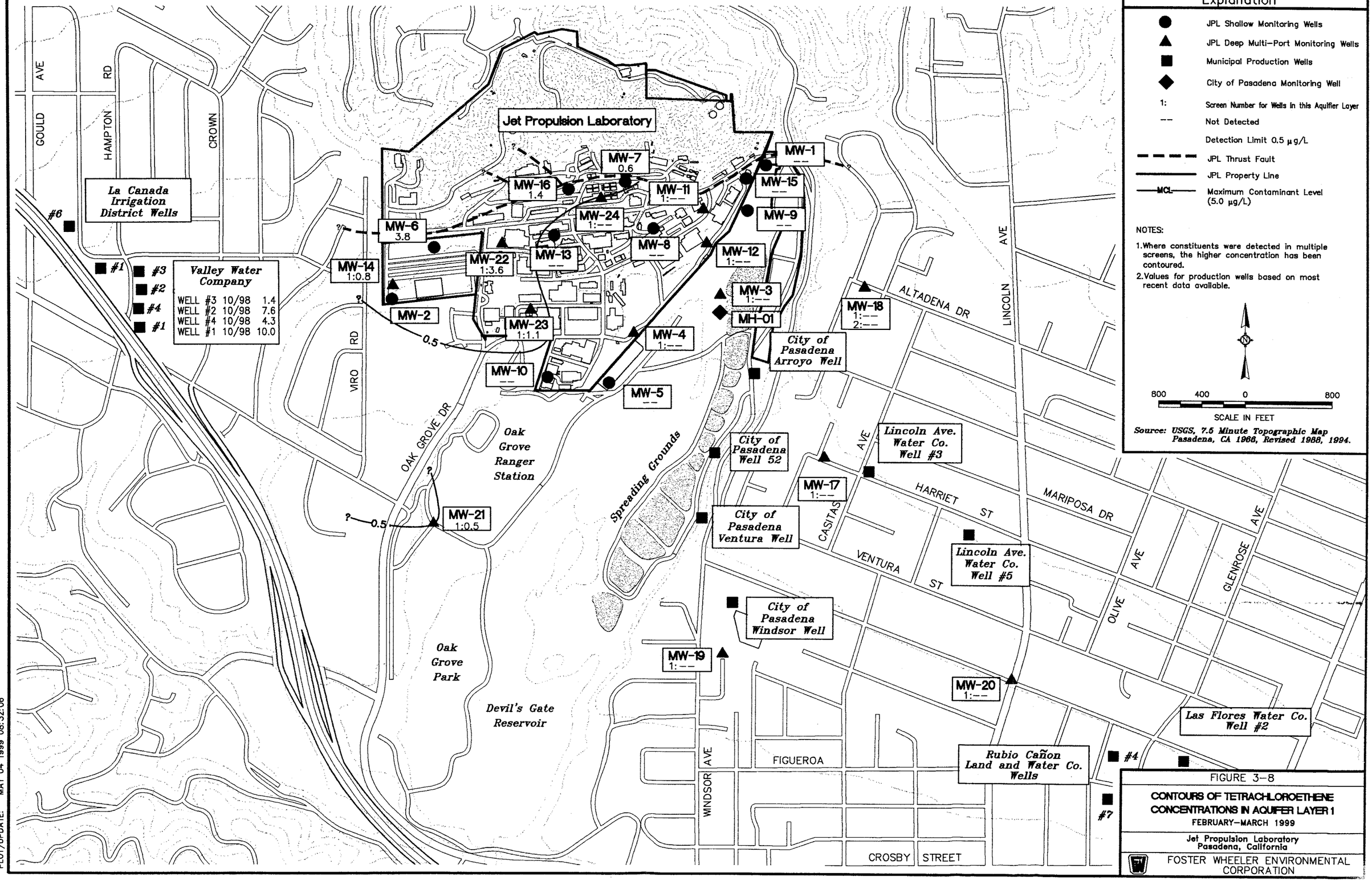
CONTOURS OF 1,2-DICHLOROETHANE CONCENTRATIONS IN AQUIFER LAYER 1

FEBRUARY–MARCH 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I:\1572-JPL\DWG\OU1-OU3\QUARTER\991\FIG3-7.DWG
PLOT/UPDATE: APR 27 1999 10:12:28



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 (5.0 µg/L)

NOTES:

1. Where constituents were detected in multiple screens, the higher concentration has been contoured.
2. Values for production wells based on most recent data available.

800 400 0 800

SCALE IN FEET

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

FIGURE 3-8

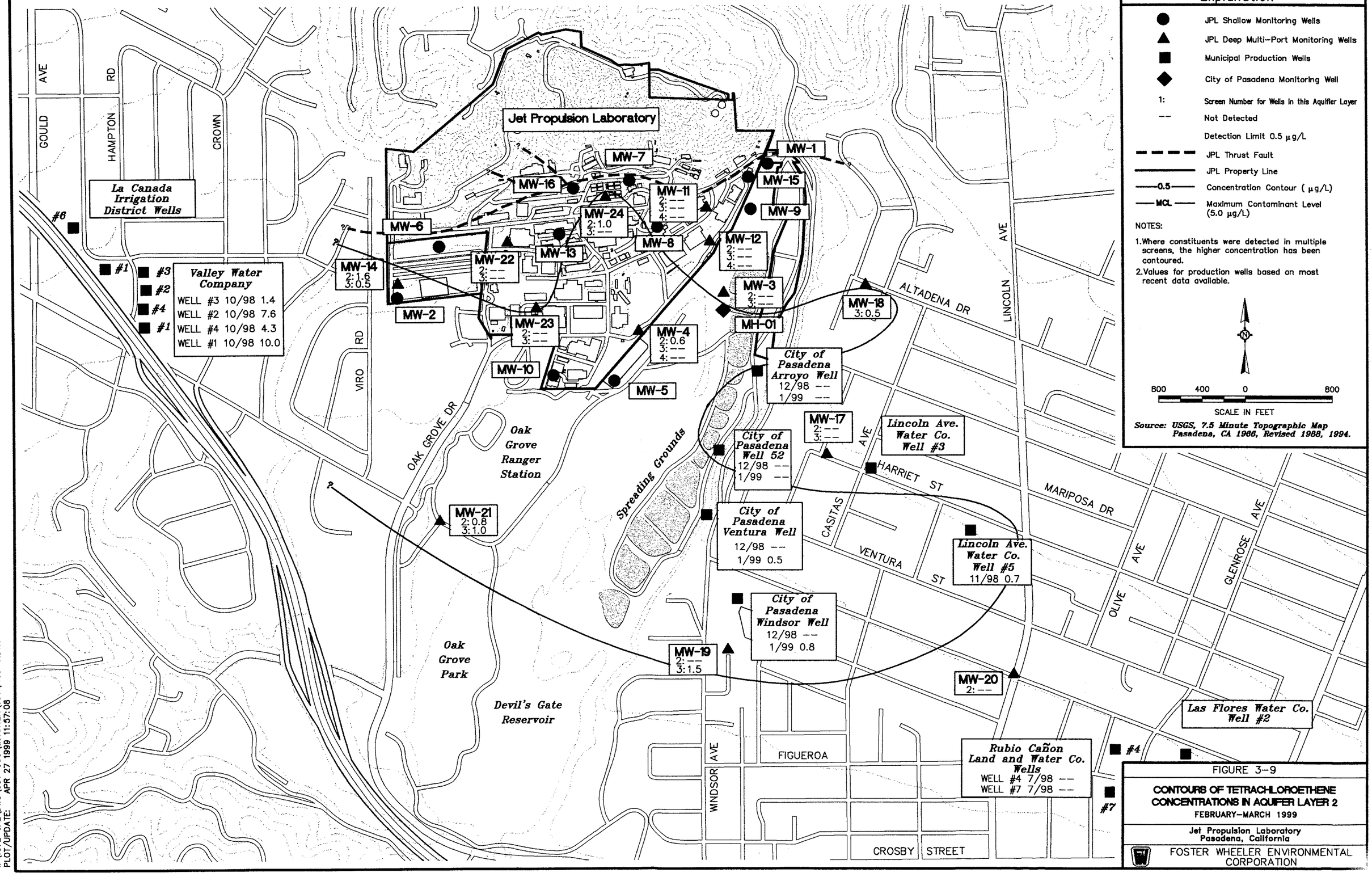
CONTOURS OF TETRACHLOROETHENE CONCENTRATIONS IN AQUIFER LAYER 1

FEBRUARY-MARCH 1999

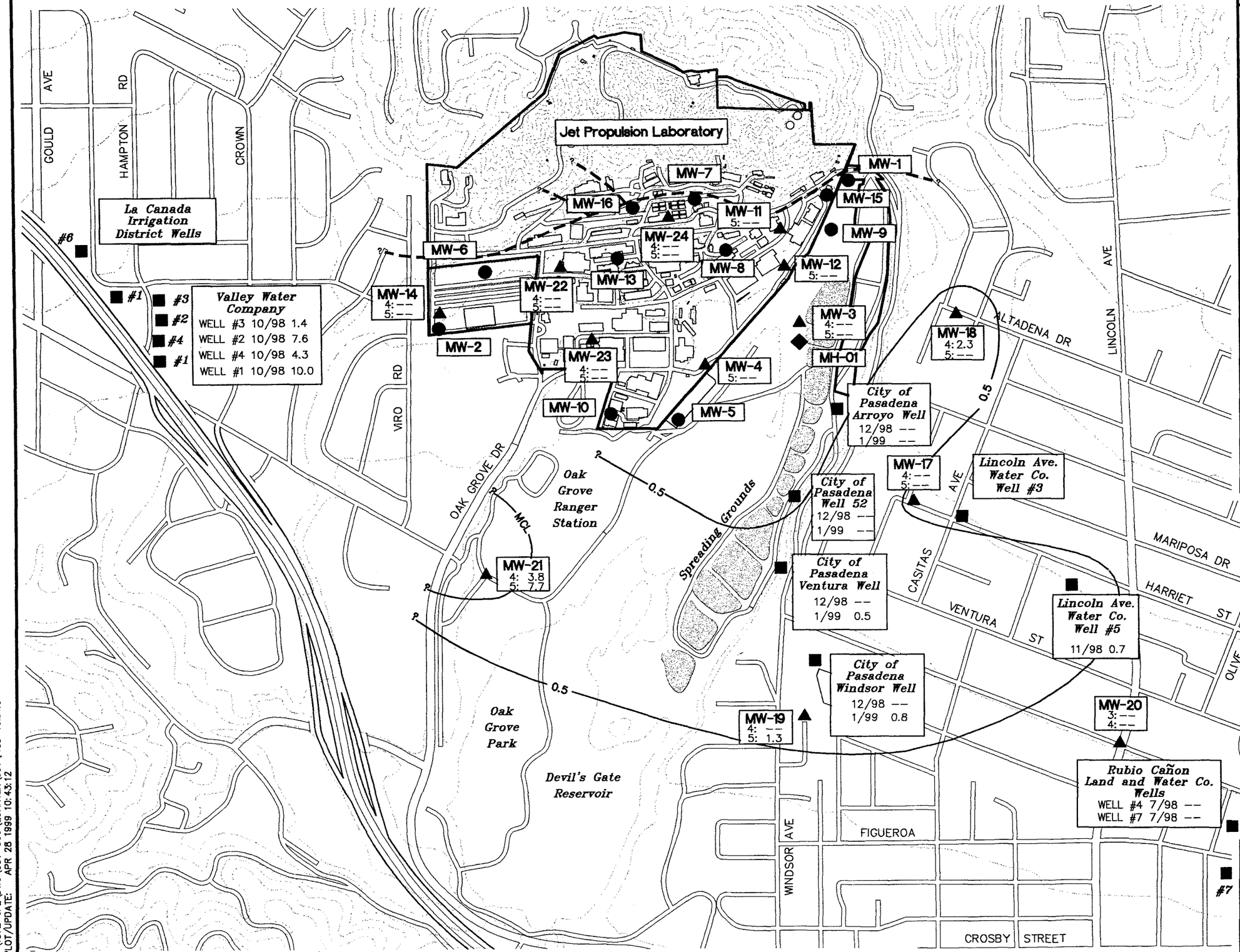
Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I: \1572-JPL\DWG\OU1-OU3\QUARTER\991\FIG3-8.DWG
PLOT/UPDATE: MAY 04 1999 08:32:06



I:\1572-JPL\DWG\OU1-OU3\QUARTER\991\FIG3-9.DWG
PLOT/UPDATE: APR 27 1999 11:57:08



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)

NOTES:

1. Where constituents were detected in multiple screens, the higher concentration has been contoured.
2. Values for production wells based on most recent data available.

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

FEBRUARY-MARCH 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I:\1572-JPL\DWG\OU1-OU3\QUARTER\991\FIG3-10.DWG
PLOT/UPDATE: APR 28 1999 10:43:12

Jet Propulsion Laboratory

MW-7 150
MW-16 790
MW-11 1:--
MW-1 --
MW-15 --
MW-9 --
MW-24 1:14
MW-6 --
MW-8 --
MW-12 1:--
MW-22 1:6.4
MW-13 98
MW-14 1:4.2
MW-2
MW-3 1:--
MH-01
MW-18 1:-- 2:--
MW-23 1:8.4
MW-4 1:--
MW-10 39
MW-5 --
MW-21 1:14
MW-17 1:--
MW-19 1:--
MW-20 1:4.9

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

4.0 100 IAL

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

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-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)

NOTES:

1. Where constituents were detected in multiple screens, the higher concentration has been contoured.
2. Values for production wells based on most recent data available.

N

800 400 0 800

SCALE IN FEET

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

FIGURE 3-11

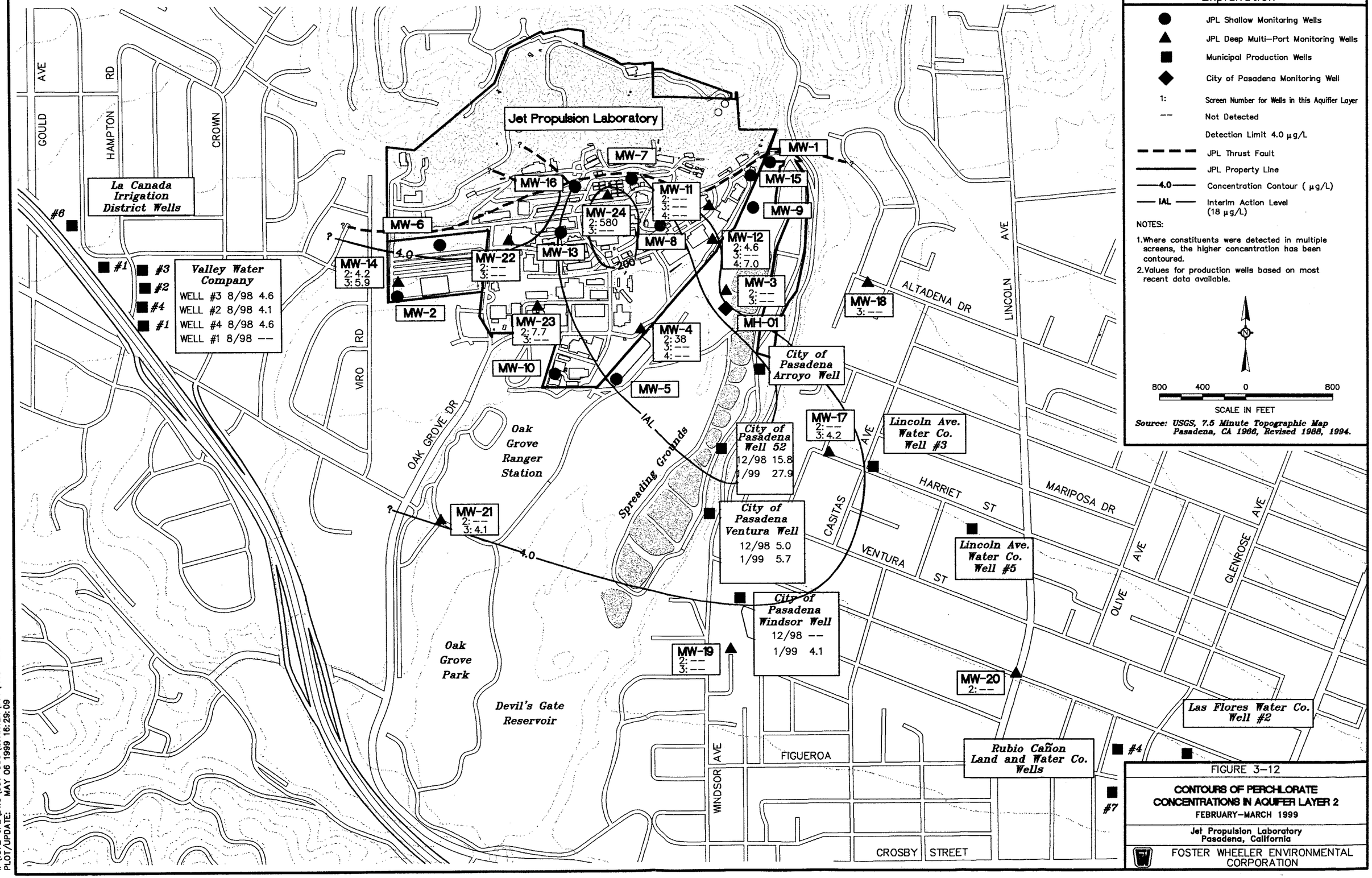
CONTOURS OF PERCHLORATE CONCENTRATIONS IN AQUIFER LAYER 1

FEBRUARY-MARCH 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I:\1572-JPL\DWG\OU1-OU3\QUARTER\991\FIG3-11.DWG
PLOT/UPDATE: MAY 06 1999 12:58:37



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)

NOTES:

1. Where constituents were detected in multiple screens, the higher concentration has been contoured.
2. Values for production wells based on most recent data available.

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

FEBRUARY–MARCH 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I:\1572-JPL\DWG\OU1-OU3\QUARTER\991\FIG3-12.DWG
PLOT/UPDATE: MAY 06 1999 16:29:09

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: 9.8
5: 6.4
MW-18
4: 24
5: --
MW-19
4: --
5: --
MW-20
3: --
4: --
MW-21
4: --
5: 4.2
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	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
12/98 15.0
1/99 27.9

City of Pasadena Ventura Well
12/98 5.0
1/99 5.7

City of Pasadena Windsor Well
12/98 --
1/99 4.1

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

IAL
4.0

Oak Grove Ranger Station

Oak Grove Park

Devil's Gate Reservoir

Spreading Grounds

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

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- 1: Screen Number for Wells in this Aquifier Layer
- -- Not Detected
- Detection Limit 4.0 µg/L
- JPL Thrust Fault
- JPL Property Line
- 4.0 Concentration Contour (µg/L)
- IAL Interim Action Level (18 µg/L)

NOTES:

1. Where constituents were detected in multiple screens, the higher concentration has been contoured.
2. Values for production wells based on most recent data available.

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

FEBRUARY-MARCH 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I:\1572-JPL\DWG\OU1-OU3\QUARTER\991\FIG3-13.DWG
PLOT/UPDATE: MAY 05 1999 16:10:28

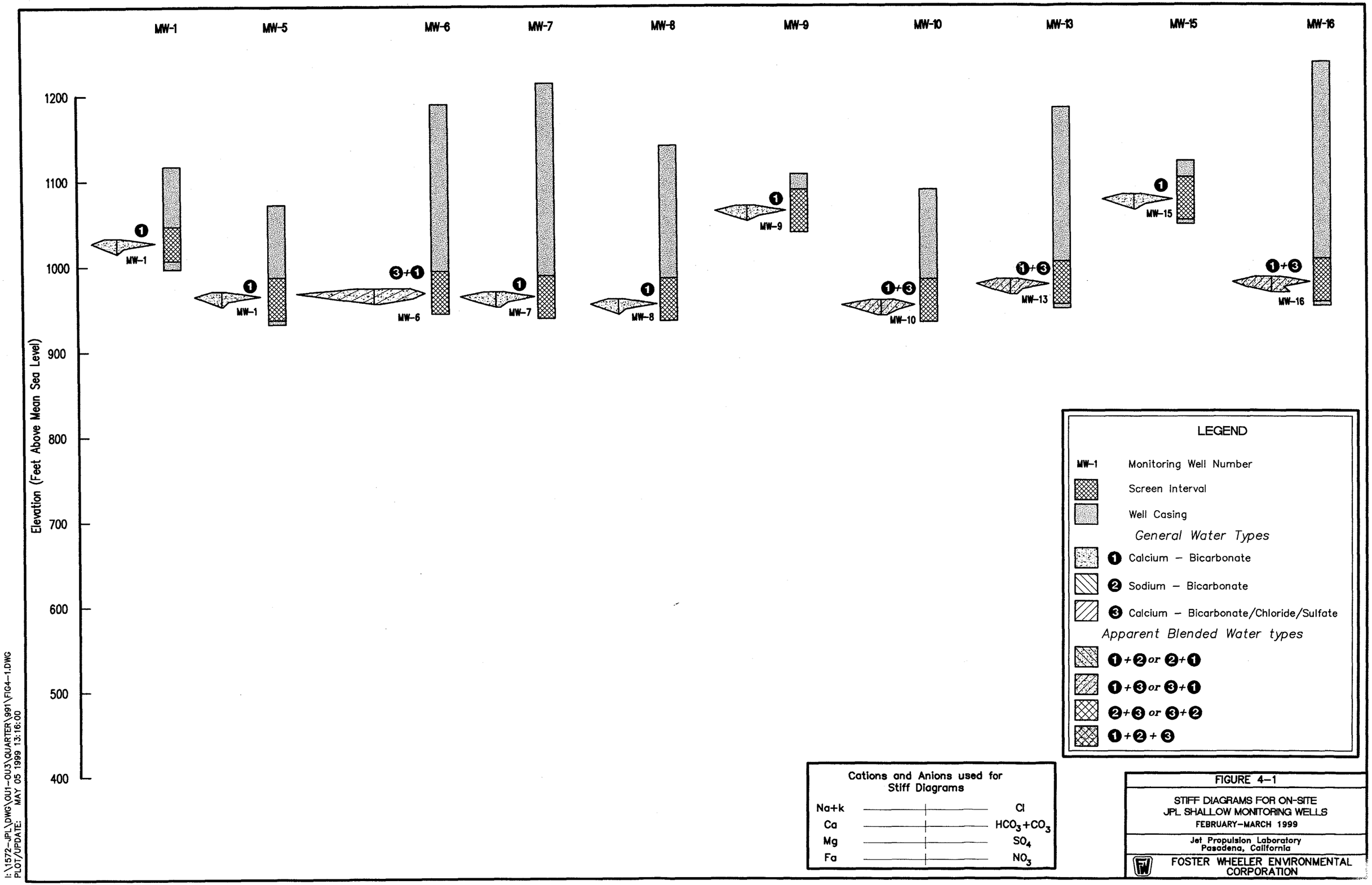


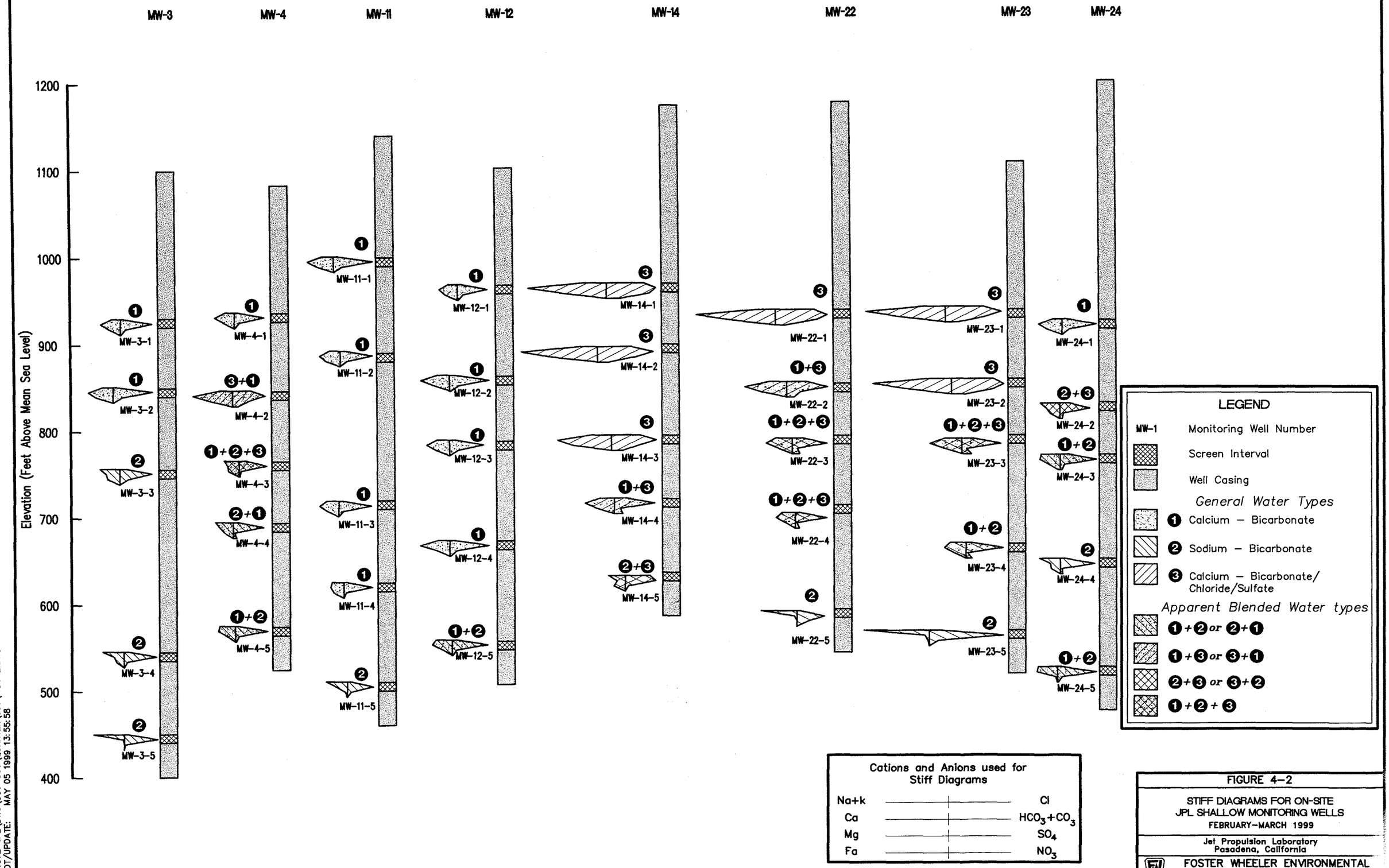
FIGURE 4–1

STIFF DIAGRAMS FOR ON-SITE JPL SHALLOW MONITORING WELLS
FEBRUARY–MARCH 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I:\1572-JPL\DWG\OU1-OU3\QUARTER\991\FIG4-1.DWG
PLOT/UPDATE: MAY 05 1999 13:16:00



Cations and Anions used for Stiff Diagrams

Na+k	Cl
Ca	HCO_3+CO_3
Mg	SO_4
Fa	NO_3

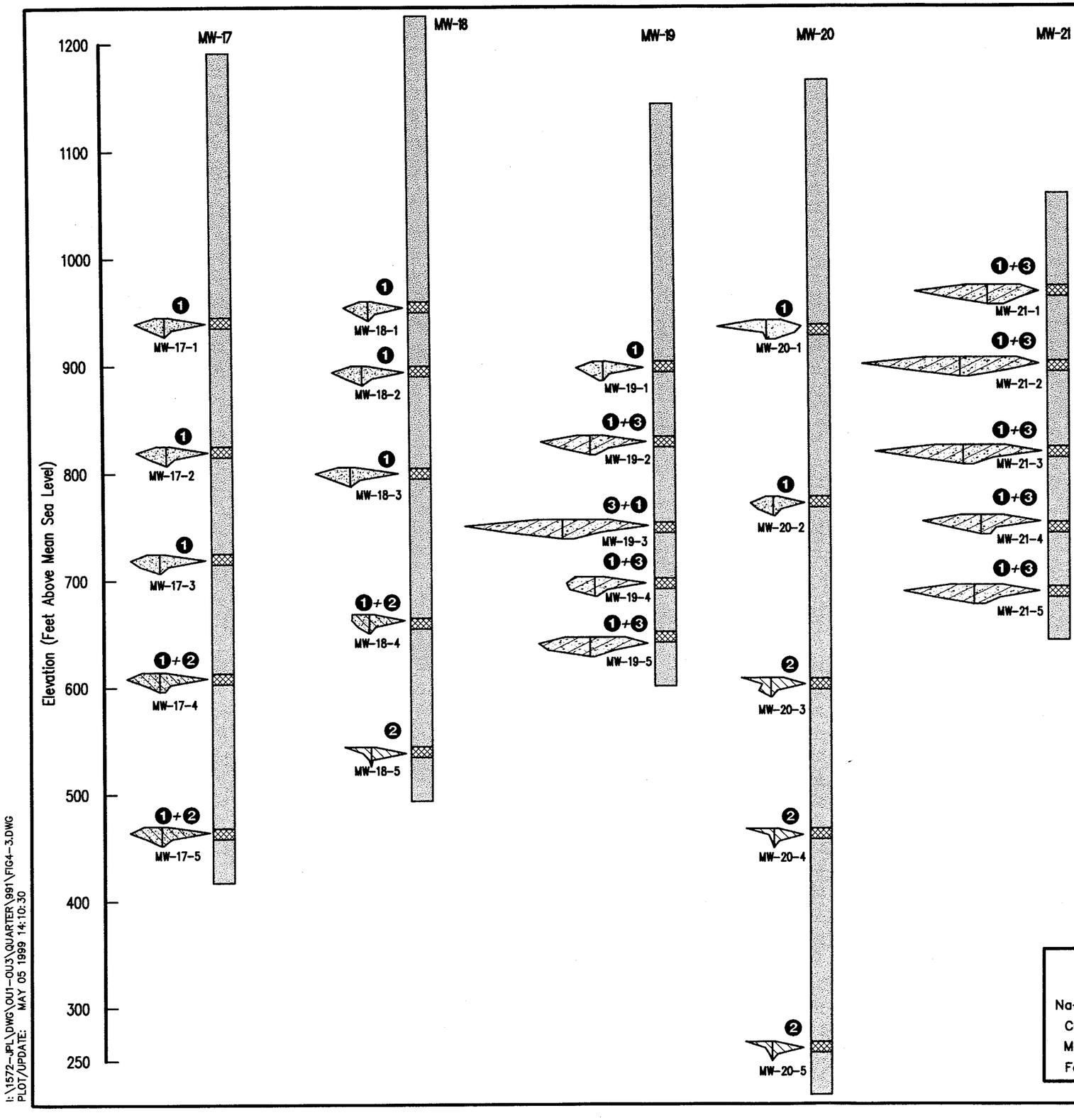
FIGURE 4–2

STIFF DIAGRAMS FOR ON-SITE
JPL SHALLOW MONITORING WELLS
FEBRUARY–MARCH 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I:\1572-JPL\DWG\OU1-OU3\QUARTER\991\FIG4-2.DWG
PLOT/UPDATE: MAY 05 1999 13:55:58



LEGEND

MW-1 Monitoring Well Number

Screen Interval

Well Casing

General Water Types

1 Calcium – Bicarbonate

2 Sodium – Bicarbonate

3 Calcium – Bicarbonate/Chloride/Sulfate

Apparent Blended Water types

1+2 *or* 2+1

1+3 *or* 3+1

2+3 *or* 3+2

1+2+3

Cations and Anions used for Stiff Diagrams

Na+k	Cl
Ca	HCO_3+CO_3
Mg	SO_4
Fa	NO_3

FIGURE 4–3

STIFF DIAGRAMS FOR ON-SITE JPL SHALLOW MONITORING WELLS

FEBRUARY–MARCH 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I:\1572-JPL\DWG\OU1-OU3\QUARTER\991\FIG4-3.DWG
PLOT/UPDATE: MAY 05 1999 14:10:30

Explanation

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

Note: Contours Represent Feet Above Mean Sea Level

N

800 400 0 800

SCALE IN FEET

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

Jet Propulsion Laboratory

MW-1 1093.43
MW-2
MW-3 1000.25
MW-4 1002.96
MW-5 1000.51
MW-6 1006.68
MW-7 -
MW-8 1001.83
MW-9 1086.19
MW-10 998.27
MW-11 1025.84
MW-12 1010.90
MW-13 999.28
MW-14 1008.89
MW-15 1090.16
MW-16 -
MW-17 990.71
MW-18 983.52
MW-19 984.57
MW-20 971.26
MW-21 999.90
MW-22 1000.48
MW-23 999.08
MW-24 999.64
MH-01

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

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

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

FIGURE 5-1

WATER-TABLE ELEVATION CONTOUR MAP

February 19, 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I:\1572-JPL\DWG\OU1-OU3\QUARTER\984\FIG5-1.DWG
PLOT/UPDATE: MAY 03 1999 09:59:07

Jet Propulsion Laboratory

MW-1 1092.82
MW-2 1012.88
MW-3 1003.20
MW-4 1005.70
MW-5 1003.54
MW-6 1010.49
MW-7 -
MW-8 1005.77
MW-9 1086.09
MW-10 1002.35
MW-11 1028.64
MW-12 1011.52
MW-13 1003.99
MW-14 1012.88
MW-15 1090.58
MW-16 1003.54
MW-17 996.30
MW-18 969.72
MW-19 968.58
MW-20 975.57
MW-21 1003.37
MW-22 1005.19
MW-23 1003.92
MW-24 1004.50
MH-01

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

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

Explanation

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

Note: Contours Represent Feet Above Mean Sea Level

N

800 400 0 800
SCALE IN FEET

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

FIGURE 5–2

WATER-TABLE ELEVATION CONTOUR MAP

March 24, 1999

Jet Propulsion Laboratory
Pasadena, California

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I:\1572-JPL\DWG\OU1-OU3\QUARTER\984\FIG5-2.DWG
PLOT/UPDATE: MAY 03 1999 10:39:42

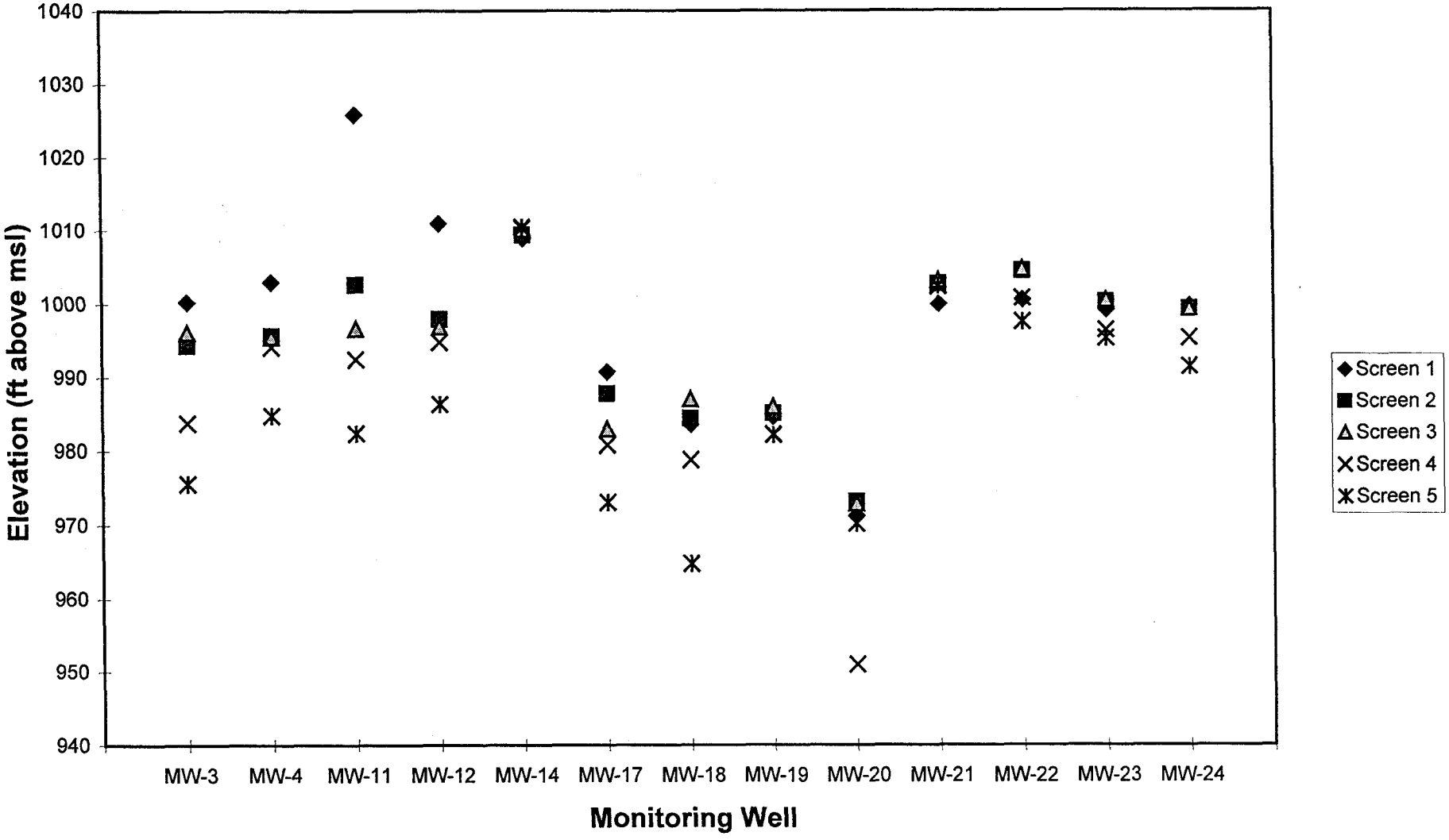


Figure 5-3

HYDRAULIC HEAD ELEVATIONS

FROM DEEP (MP) WELLS

February 19,1999

Jet Propulsion Laboratory

Pasadena, California

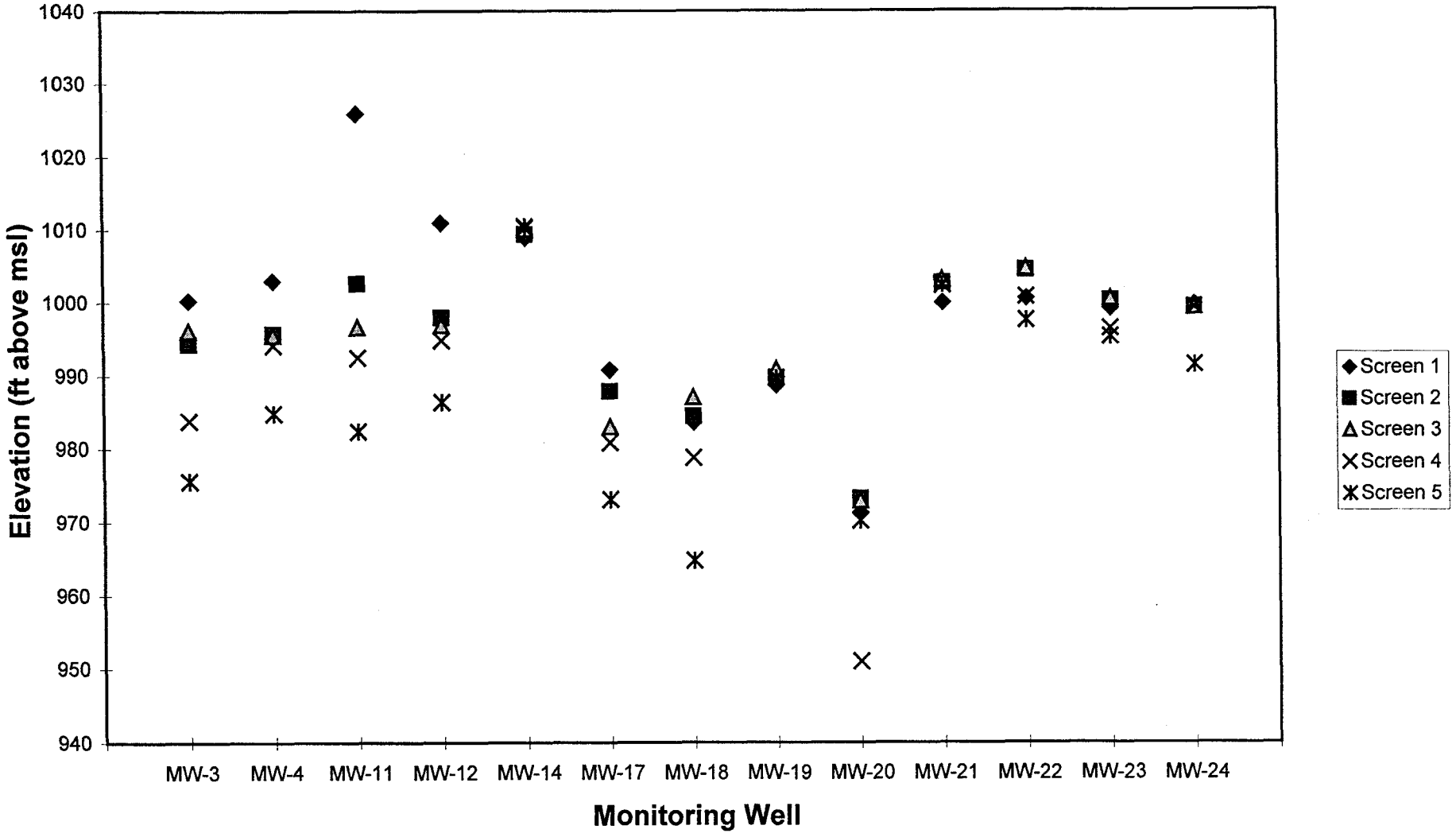


Figure 5-4

HYDRAULIC HEAD ELEVATIONS

FROM DEEP (MP) WELLS

March 24,1999

Jet Propulsion Laboratory

Pasadena, California

APPENDIX A

WELL DEVELOPMENT/WELL SAMPLING LOG FORMS FOR SHALLOW WELLS

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0268
Date : 3/23/99
Site Engineer : J. BRENNER, T. TURPIN - KEASLER, M. LOSI
Well Number : MW-1
Equipment : 2" GRUNDFOS PUMP, DRT-15CE, YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	23.86	TOP OF 4" CASING	23.86
Depth to Sediment (ft)	119.20	TOP OF 4" CASING	119.20
Thickness of Sediment (ft)	0.80		0.80

Depth of Well (ft): 120
Diameter of Casing (ft): 0.333
Water Column Height (ft): 95.34
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 62.06
Casing Volumes Purged: 0.81
Total Volume Purged (gals): 50

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1000	—	—	—	—	2.0	PUMP ON, CONTROL BOX SET AT 155 Hz
1005	7.08	1.99	14.4	341	2.0	WATER CLEAR
1010	7.93	2.60	14.4	336	2.0	WATER CLEAR
1015	7.89	3.05	14.8	332	2.0	WATER CLEAR
1020	7.75	3.29	15.2	341	2.0	WATER CLEAR
1022	7.57	1.99	15.3	343	2.0	READY TO SAMPLE
1025	—	—	—	—	0.02	REDUCE FLOW, CLOSE MW-991-0679
1026	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET AT 30' BTOC

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0268
Date : 3/22/99
Site Engineer : J. BRENNER, T. TURPIN-KAISER
Well Number : MW-5
Equipment : 2" GRUNDFOS PUMP, YSI 3500 DET-ISE
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	68.59	TOP OF 4" CASING	68.59
Depth to Sediment (ft)	133.76	TOP OF 4" CASING	133.76
Thickness of Sediment (ft)	6.24		6.24

Depth of Well (ft): 140.0
Diameter of Casing (ft): 0.333
Water Column Height (ft): 65.17
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 42.4
Casing Volumes Purged: 1.6
Total Volume Purged (gals): 68

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1405	—	—	—	—	1.7	PUMP ON; CONTROL BOX SET @ 21 Hz
1410	7.63	11.18	17.4	326	1.7	WATER CLEAR
1415	8.11	6.36	17.6	305	1.7	WATER CLEAR
1420	7.86	6.96	17.5	303	1.7	WATER CLEAR
1425	7.67	7.63	17.0	299	1.7	WATER CLEAR
1430	7.63	7.91	17.4	294	1.7	WATER CLEAR
1435	7.48	7.05	17.6	294	1.7	WATER CLEAR
1440	7.47	7.95	17.7	293	1.7	READY TO SAMPLE
1445	—	—	—	—	0.02	FLOW REDUCED; COLLECT MW-991-067
1447	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET AT 75' BTOC

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0269
Date : 3/22/99
Site Engineer : J. BRENNAN, T. TURPIN-KAISER
Well Number : MW-6
Equipment : 2" GRUNDFOS PUMP, DRT-ISCO, YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	178.50	TOP OF 4" CASING	178.50
Depth to Sediment (ft)	238.80	TOP OF 4" CASING	238.80
Thickness of Sediment (ft)	6.2		6.2

Depth of Well (ft) 245.0
Diameter of Casing (ft) 0.333
Water Column Height (ft) 60.3
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 39.25
Casing Volumes Purged 2.06
Total Volume Purged (gals) 81

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0950	—	—	—	—	1.8	PUMP ON, CONTROL BOX SET AT 340 Hz
0955	7.01	33.5	19.4	1067	1.8	WATER SL. CLOUDY
1000	6.95	24.2	20.7	984	1.8	WATER SL. CLOUDY
1005	6.77	18.4	20.5	1042	1.8	WATER SL. CLOUDY
1010	6.73	10.4	20.6	1053	1.8	WATER CLEARING
1015	6.70	6.2	20.6	1044	1.8	WATER CLEAR
1020	6.76	5.42	20.5	1022	1.8	WATER CLEAR
1025	6.78	3.26	20.5	995	1.8	WATER CLEAR
1030	6.79	3.30	20.6	1019	1.8	WATER CLEAR
1032	6.78	2.71	20.5	1025	1.8	WATER CLEAR, READY
1035	—	—	—	—	0.02	REDUCE FLOW, COLLECT MW-991-0066
1036	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET AT 185' BTOC

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0268
Date : 3/19/99
Site Engineer : J. BRENNER, I. MAYES
Well Number : MW-7
Equipment : 2" GRUNDFOS PUMP, DIP-ISCE, YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	210.75	TOP OF 4" CASING	210.75
Depth to Sediment (ft)	268.47	TOP OF 4" CASING	268.47
Thickness of Sediment (ft)	1.53		1.53

Depth of Well (ft) 270.0
Diameter of Casing (ft) 0.333
Water Column Height (ft) 57.72
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 37.58
Casing Volumes Purged 2.19
Total Volume Purged (gals) 82.5

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1440	—	—	—	—	1.5	PUMP ON, CONTROL
						BOX SET AT 350 Hz
1445	7.83	69.0	21.5	453	1.5	WATER CLOUDY
1450	7.79	48.0	21.5	462	1.5	WATER CLOUDY
1455	8.14	34.3	21.2	462	1.5	WATER CLOUDY
1500	10.53	37.0	21.7	465	1.5	WATER CLOUDY
1505	8.07	35.4	21.5	463	1.5	WATER CLOUDY
1510	8.04	31.5	21.4	463	1.5	WATER CLOUDY
1515	8.07	25.5	21.6	460	1.5	WATER CLOUDY
1520	8.07	15.2	21.3	453	1.5	WATER CLEARING
1525	8.07	7.5	20.5	449	1.5	WATER CLEAR
1530	8.07	4.9	21.0	453	1.5	WATER CLEAR
1533	8.02	4.3	21.1	454	1.5	READY TO SAMPLE
1535	—	—	—	—	0.02	FLOW REDUCED
1540	—	—	—	—	0.02	COLLECT MW-991-065
1541	—	—	—	—	—	PUMP OFF
1545	—	—	—	—	—	FIELD BLANK
						MW-991-201 COLLECTED

Notes Sampling Procedures: PUMP SET AT 216' BGS

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0268
Date : 3/23/99
Site Engineer : J. BRENNER, T. TURPIN-KEASEY, M. LOSI
Well Number : MW-8
Equipment : 2" GRUNDFOS PUMP, DRUM, ISCO, YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	133.97	TOP OF 4" CASING	133.97
Depth to Sediment (ft)	202.18	TOP OF 4" CASING	202.18
Thickness of Sediment (ft)	2.82		2.82

Depth of Well (ft) 205.0
Diameter of Casing (ft) 0.333
Water Column Height (ft) 68.21
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 44.40
Casing Volumes Purged 1.18
Total Volume Purged (gals) 52.5

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0730	—	—	—	—	2.1	PUMP ON, CONTROL BOX SET AT 30.0 HZ
0735	7.74	2.20	16.4	296	2.1	WATER CLEAR
0740	7.22	1.76	16.6	290	2.1	WATER CLEAR
0745	7.00	1.30	17.6	289	2.1	WATER CLEAR
0750	7.01	1.49	17.3	286	2.1	READY TO SAMPLE
0755	—	—	—	—	0.02	FLOW REDUCED, COLLECT MW-991-064
0756	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET AT 140' BGS

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0268
Date : 3/23/99
Site Engineer : J. BRENNER, T. TURPIN - KEASLER, M. LOSI
Well Number : MW-9
Equipment : 2" GRUNDFOS PUMP - DT-15CE; YSI 350
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	19.96	TOP OF 4" CASING	19.96
Depth to Sediment (ft)	66.89	TOP OF 4" CASING	66.89
Thickness of Sediment (ft)	3.11		3.11

Depth of Well (ft) 70.0
Diameter of Casing (ft) 0.333
Water Column Height (ft) 46.93
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 30.55
Casing Volumes Purged 1.88
Total Volume Purged (gals) 57.5

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0900	7.70	1.82	17.2	423	2.3	PUMP ON; CONTROL BOX SET AT 195 Hz
0905	6.97	8.48	17.7	452	2.3	WATER CLEAR
0910	6.90	6.62	17.5	435	2.3	WATER CLEAR
0915	6.95	3.90	17.3	433	2.3	WATER CLEAR
0920	6.95	2.75	17.2	434	2.3	READY TO SAMPLE
0925	—	—	—	—	0.02	FLOW REDUCED; COLLECT MW-991-0623
0930	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET AT 25' BTOC

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0268
Date : 3/22/99
Site Engineer : J. BRENNER, T. RAPP-KAISER, M. LOSI
Well Number : MW-10
Equipment : 2" GRUNDFOS PUMP DRS-15CE; YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	85.95	TOP OF 4" CASING	85.95
Depth to Sediment (ft)	153.90	TOP OF 4" CASING	153.90
Thickness of Sediment (ft)	1.10		1.10

Depth of Well (ft) 155.00
Diameter of Casing (ft) 0.333
Water Column Height (ft) 67.95
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 44.24
Casing Volumes Purged 2.48
Total Volume Purged (gals) 110

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1135	—	—	—	—	2.0	PUMP ON; CONTROL BOX SET AT 250 Hz
1136	7.18	5.31	21.0	667	2.0	WATER CLEAR
1140	7.15	4.44	20.4	656	2.0	WATER CLEAR
1145	7.11	6.23	20.9	663	2.0	WATER CLEAR
1150	7.01	19.0	21.1	665	2.0	WATER CLEAR
1155	7.12	17.7	20.6	650	2.0	WATER CLEAR
1200	7.15	12.2	20.7	645	2.0	WATER CLEAR
1205	7.20	8.06	20.7	645	2.0	WATER CLEAR
1210	7.24	6.46	21.1	637	2.0	WATER CLEAR
1215	7.24	5.94	20.4	633	2.0	WATER CLEAR
1220	7.25	4.12	20.4	644	2.0	WATER CLEAR
1225	7.22	3.88	20.9	638	2.0	WATER CLEAR
1229	7.24	3.34	20.8	653	2.0	WATER CLEAR
1230	—	—	—	—	0.02	REDUCE FLOW; COLLECT MW-991-1062
1240	—	—	—	—	0.02	COLLECT MW-991-061
1241	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET AT 92' BTOC

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0269
Date : 3/19/98
Site Engineer : J. BRENNER, I. MAYES
Well Number : MW-13
Equipment : 2" GRUNDFOS PUMP
DIP-ISCE, YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	181.43	TOP OF 4" CASING	181.43
Depth to Sediment (ft)	234.85	TOP OF 4" CASING	234.85
Thickness of Sediment (ft)	0.15		0.15

Depth of Well (ft) 235.0
Diameter of Casing (ft) 0.333
Water Column Height (ft) 53.42
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 34.77
Casing Volumes Purged 1.00
Total Volume Purged (gals) 35

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1005	—	—	—	—	1.4	PUMP ON, CONTROL BOX SET AT 31.5HZ
1010	8.22	30.5	21.8	537	1.4	WATER SL. CLOUDY
1015	8.01	10.5	21.7	524	1.4	WATER CLEARING
1020	7.96	3.0	22.3	526	1.4	WATER CLEAR
1025	7.82	1.7	22.4	528	1.4	WATER CLEAR
1030	7.81	1.0	22.4	529	1.4	READY TO SAMPLE
1031	—	—	—	—	0.02	REDUCE FLOW
1035	—	—	—	—	0.02	COLLECT MW-991-049
1045	—	—	—	—	0.02	COLLECT MW-991-048
1046	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET AT 187' BGS

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPC
Project Number : 1572.0269
Date : 3/23/99
Site Engineer : J. BRENNER, T. TURPIN-KEASLER, M. LOSI
Well Number : MW-15
Equipment : 2" GRUNDFOS PUMP DRT-15CE, YS.3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	31.40	TOP OF 4" CASING	31.40
Depth to Sediment (ft)	74.87	TOP OF 4" CASING	74.87
Thickness of Sediment (ft)	0.13		0.13

Depth of Well (ft) 75.0
Diameter of Casing (ft) 0.333
Water Column Height (ft) 43.47
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 28.29
Casing Volumes Purged 1.59
Total Volume Purged (gals) 45

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1100	—	—	—	—	1.8	PUMP ON, CONTROL BOX SET AT 139 PSI
1105	7.22	7.62	18.2	412	1.8	WATER CLEAR
1110	7.07	2.20	17.9	433	1.9	WATER CLEAR
1115	7.10	0.62	17.9	432	1.9	WATER CLEAR
1120	7.15	0.62	17.9	431	1.9	READY TO SAMPLE
1125	—	—	—	—	0.02	FLOW REDUCED TO COLLECT MW-991-042, -042MS, -042MSD
1130	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET AT 37' BGS

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0268
Date : 3/19/99
Site Engineer : J. BRENNAN, I. MAYES
Well Number : MW-16
Equipment : 2" GRUNDFOS PUMP DIT-15CE; YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	234.52	TOP OF 4" CASING	234.52
Depth to Sediment (ft)	285.0	TOP OF 4" CASING	285.0
Thickness of Sediment (ft)	Ø		Ø

Depth of Well (ft) 285.0
Diameter of Casing (ft) 0.333
Water Column Height (ft) 50.48
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 32.81
Casing Volumes Purged 2.28
Total Volume Purged (gals) 75

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1700	—	—	—	—	2.5	PUMP ON, CONTROL BOX SET AT 376HZ
1705	8.44	3.11	21.0	507	2.5	WATER CLEAR
1710	7.51	2.71	21.6	511	2.5	WATER CLEAR
1715	7.50	1.82	20.9	514	2.5	WATER CLEAR
1720	7.54	1.74	19.9	514	2.5	WATER CLEAR
1725	7.53	1.34	21.0	517	2.5	WATER CLEAR
1728	7.51	1.01	21.1	516	2.5	READY TO SAMPLE
1730	—	—	—	—	0.0L	REDUCE FLOW, COLLECT MW-991-0411
1735	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET AT 240' 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

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0268
Date : 3/2/99
Site Engineer : D. DIRKIN / P. FELDBAUSCH
Well Number : MW-3
Equipment : YSI 3560
DXI-ISCE
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
1405	9.73	4.43	22.4	366	—	Initial RUN TO SCREEN 5; INITIAL
1440	—	—	—	—	—	PARAMETERS COLLECT MW-991-075 (07
1510	9.60	4.38	21.4	500	—	3rd RUN TO SCREEN 5; FINAL PARAM.
1535	8.81	4.53	21.7	339	—	1ST RUN TO SCREEN 4; INITIAL PARAM
1400	—	—	—	—	—	COLLECT MW-991-075
1430	5.25	~~5.59~~ 3.53	19.8	325	—	3rd RUN TO SCREEN 4, Final Param

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JSL
Project Number : 1572.0268
Date : 3/3/99
Site Engineer : D. DIRKIN/B. FEINBAUER

Well Number : MW-3
Equipment : YSI 3800
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
0740	7.44	3.18	14.4	364	—	1ST RUN, TO SCREEN 3, INITIAL PARAMETERS
0800	—	—	—	—	—	COLLECT SAMPLE MW-991-076
0821	7.69	2.28	14.5	182	—	3rd RUN, COLLECT SAMPLE, FINAL PARAM.
0925	7.63	2.15	14.6	371	—	1ST RUN TO SCREEN 2, INITIAL PARAM.
1000	—	—	—	—		2nd RUN. COLLECT SAMPLE MW-991-077
1025	7.71	2.91	~~3.83~~ 15.2	383	—	3rd RUN, FINAL PARAMETERS
1043	7.73	4.73	15.6	301	—	1ST RUN TO SCREEN 1, INITIAL PARAMETERS
1100	~~7.74~~	~~6.4~~	—	—		COLLECT SAMPLE MW-991-078
1115	7.74	6.9	16.5	164	—	3rd RUN, FINAL PARAMETER

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0268
Date : 3/3/99
Site Engineer : J. BRENNER, B. FELDPAUSCH
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
0955	8.34	2.39	17.7	353	—	1ST RUN TO SCREEN # 5; INITIAL PARAMETERS
0920	—	—	—	—	—	COLLECT MW-991-068
0945	8.36	2.91	16.9	346	—	3RD RUN TO SCREEN #5, FINAL PARAMETERS
1015	8.50	3.33	15.5	356	—	1ST RUN TO SCREEN #4; INITIAL PARAMETERS
1035	—	—	—	—	—	COLLECT MW-991-069
1050	8.51	2.51	18.6	360	—	3RD RUN TO SCREEN #4, FINAL PARAMETERS
1110	8.45	2.92	18.9	337	—	1ST RUN TO SCREEN # 3; INITIAL PARAMETERS
1130	—	—	—	—	—	COLLECT MW-991-070, -070MS, -070MSD
1145	8.49	1.51	19.1	335	—	3RD RUN TO SCREEN # 3; FINAL PARAMETERS
1215	7.73	0.98	13.8	347	—	1ST RUN TO SCREEN # 1; INITIAL PARAMETERS
1230	—	—	—	—	—	COLLECT MW-991-072
1245	7.74	2.38	16.7	319	—	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 : 1572.0268
Date : 3/17/99
Site Engineer : J. BRENNER; I. MAYES

Well Number : MW-4
Equipment : TSI 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
0915	7.89	6.1	16.2	617	—	1ST RUN TO SCREEN #2; INITIAL PARAMETERS
0930	—	—	—	—	—	COLLECT MW-991-072
0945	—	—	—	—	—	COLLECT MW-991-071 (DUPLICATE)
1050	7.32	189	17.4	637	—	FINAL RUN TO SCREEN #2; FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JA
Project Number : 1572.0268
Date : 3/5/99
Site Engineer : D. DIRISIN

Well Number : MW-11
Equipment : YSI-3560
DT-15CE
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
0754	8.39	4.13	15.0	271	—	1ST RUN TO SCREEN 5, INITIAL PARAMETERS
0820	—	—	—	—	—	CANCELED RUN —
0902	—	—	—	—	—	COLLECT SAMPLE MW-991-056
0920	8.99	3.78	17.6	290	—	3rd RUN TO SCREEN 5, FINAL PARAM
0950	9.29	1.42	15.8	275	—	1ST RUN TO SCREEN 4, INITIAL PARAM.
1015	—	—	—	—	—	COLLECT SAMPLE MW-991-057
1050	9.28	2.58	17.0	287		3rd RUN TO SCREEN 4 - FINAL PARAM.
1122	9.16	2.63	19.4	343	—	1ST RUN TO SCREEN 3, INITIAL PARAM.
1145	—	—	—	—	—	COLLECT SAMPLE MW-991-058
1205	~~5.89~~	~~1.64~~	~~18.5~~ QD			3rd RUN TO SCREEN 3, FINAL PARAM
	8.36	2.33 1.64	20.2	234	—	
1238	7.31	12.85	19.2	385	—	1ST RUN TO SCREEN 2 - INITIAL PARAMETERS
1258	7.22	12.85	20.5	399	—	ATTEMPTING TO REDUCE TURBID.
1322	~~7.03~~	11.84	28.0	~~20.1~~ QD	—	3rd RUN - COLLECT SAMPLE MW-991-059
1337	7.19	14.45	20.1	399	—	4th RUN - FINAL PARAM.
1352	8.56	1.64	19.3	443	—	1ST RUN TO SCR. 1
1410	—	—	—	—		COLLECT SAMPLE MW-991-060
1425	8.13	1.90	18.7	443	—	3rd RUN, FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0268
Date : 3/1/99
Site Engineer : J. BRENNAN, B. FELDTBUSCH
Well Number : MW-12
Equipment : YSI 3500
DRT-1SE
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESS. PROBE 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
0835	7.14	5.03	17.6	360	—	1ST RUN TO SCREEN # 5; INITIAL PARAMETERS
0905	—	—	—	—	—	COLLECT MW-991-050
0920	7.16	4.98	17.9	354	—	3RD RUN TO SCREEN #5; FINAL PARAMETERS
0950	8.01	3.08	18.2	410	—	1ST RUN TO SCREEN # 4, INITIAL PARAMETERS
1010	—	—	—	—	—	COLLECT MW-991-051
1025	7.95	2.67	18.4	409	—	3RD RUN TO SCREEN #4; FINAL PARAMETERS
1055	7.89	4.62	18.6	385	—	1ST RUN TO SCREEN # 3, INITIAL PARAMETERS
1115	—	—	—	—	—	COLLECT MW-991-052
1125	8.12	3.69	18.9	395	—	3RD RUN TO SCREEN # 3, FINAL PARAMETERS
1150	7.72	2.45	18.8	443	—	1ST RUN, TO SCREEN #2, INITIAL PARAMETERS
1210	—	—	—	—	—	COLLECT MW-991-053
1225	—	—	—	—	—	COLLECT MW-999-054
1230	7.46	1.34	20.7	464	—	3RD RUN TO SCREEN #2, FINAL PARAMETERS
1255	7.77	31.2	19.1	324	—	1ST RUN TO SCREEN #1, INITIAL PARAMETERS
1430	7.49	7.53	18.8	325	—	2ND RUN AFTER PURGING 3.5 GALS
1445	—	—	—	—	—	COLLECT MW-991-055
1500	7.15	8.69	18.9	327	—	4TH 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 : 1572.0268
Date : 3/4/99
Site Engineer : D. Dirkin/B Feldbausch
Well Number : MW-14
Equipment : YSI-3500 (S/N DIRT-ISCE)
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
0908	8.59	4.22	16.0	268	—	1ST RUN TO SCREEN #5 INITIAL PARAM.
0935	—	—	—	—	—	COLLECT SAMPLE MW-991-0943
1001	8.98	4.53	16.9	275	—	2ND RUN TO SCREEN #5 FINAL PARAMETERS
1030	8.69	2.08	17.9	485	—	1ST RUN TO SCREEN 4, INITIAL PARAMETERS.
1055	—	—	—	—	—	COLLECT SAMPLE MW-991-0944
1117	8.52	2.66	18.0	369	—	3RD RUN TO SCREEN #4. FINAL PARAMETERS
1146	8.46	0.65	18.0	856	—	1ST RUN TO SCREEN #3, INITIAL PARAMETERS.
1209	—	—	—	—	—	2ND RUN, COLLECT MW-991-0945
1223	8.44	1.52	17.7	861	—	3RD RUN, TO SCREEN #3, FINAL PARAMETERS.
1250	8.45	4.72	18.4	1059	—	1ST RUN TO SCREEN 2, INITIAL PARAM
1305	—	—	—	—	—	2ND RUN, COLLECT SAMPLE MW-991-0946
1329	8.22	4.73	17.8	1066	—	3RD RUN TO SCREEN 2, FINAL PARAMETERS
1353	8.15	4.83	17.3	1095	—	1ST RUN TO SCREEN 1, INITIAL PARAMETERS
1415	—	—	—	—	—	2ND RUN, COLLECT SAMPLE MW-991-0947
1436	7.95	4.56	18.0	1107	—	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 : 1572.0268
Date : 3-10-99
Site Engineer : D. DIRKIN

Well Number : MW-17
Equipment : YSI-3550
DGT-15CE
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	6.61	~~1750~~ 178	16.2	367	—	1ST RUN TO SCREEN 3, INITIAL PARAM.
1000	8.02	125	13.0	337		2nd RUN - ATTEMPTING TO PURGE Entire Screen
1055	8.02	4.78	13.8	195	—	1ST RUN TO SCREEN 4, INITIAL PARAM.
1125	—	—	—	—	—	COLLECT MW-99-037
1200	7.77	23.8	14.5	351	—	3rd RUN TO SCREEN 4, Final Param
1235	7.58	1.08	~~14~~ 14.3	309	—	1ST RUN TO SCREEN 2, Initial Param.
1300	—	—	—	—	—	COLLECT SAMPLE MW-991-037
1320	7.43	1.15	14.0	164	—	3rd RUN TO SCREEN 2, Final Param.
1340	7.40	1.54	~~24~~ 14.9	287	—	1ST RUN TO SCREEN 1, ~~Final~~ INITIAL PARAM.
1400	—	—	—	—	—	COLLECT SAMPLE MW-991-040
1420	7.34	1.49	14.1	149		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 : 1572.0268
Date : 3/15/99
Site Engineer : J. BRONNER, I. MAYES

Well Number : MW-17
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
1100	9.31	12.4	14.8	357	—	1ST RUN TO SCREEN #5; INITIAL PARAMETERS
1135	9.28	99.3	14.7	361	—	2ND RUN ATTEMPTING TO REACH #1 23.0 FT
1330	8.30	23.5	16.2	~~362~~	—	3RD RUN TO SCREEN #5 AFTER PURGING
1400	—	—	—	—	—	COLLECT MW 991-036
1435	8.25	117.60	14.9	355	—	FINAL RUN TO SCREEN #5 FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0268
Date : 3/10/99
Site Engineer : J. BRENNER, D. DIRKIN

Well Number : MW-17
Equipment : DIRT-ICE
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	8.77	6.28	15.2	308	—	1ST RUN TO SCREEN # 3, INITIAL PARAMETERS
0930	—	—	—	—	—	COLLECT MW-991-038
1050	8.62	12.09	17.7	351	—	FINAL RUN TO SCREEN #3, FINAL PARAMETERS
1110	—	—	—	—	—	RESAMPLE MW-991-040 *
						FOR VOCS ONLY AT
						SCREEN #1

Notes Sampling Procedures: * RESAMPLE FOR VOCS AT MW-17-1 DUE TO PROB. WITH SAMPLE COOLER AT LABORATORY - SAMPLES DESTROYED (ORIGINALS)

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0265
Date : 2/24/99
Site Engineer : J. BRENNER / B. FEWBUSCH
Well Number : MW-19
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
1010	7.38	1.98	19.6	290	—	1ST RUN TO SCREEN # 5; INITIAL PARAMETERS
1030	—	—	—	—	—	COLLECT MW-991-031
1110	7.58	3.06	21.2	305	—	3RD RUN TO SCREEN #5; [redacted] FINAL PARAMETERS
1150	8.25	2.67	20.3	388	—	1ST RUN TO SCREEN #4; INITIAL PARAMETERS
1210	—	—	—	—	—	COLLECT MW-991-032
1210	—	—	—	—	—	COLLECT MW-991-032MS [redacted]
1210	—	—	—	—	—	COLLECT MW-991-032MSD
1240	8.31	2.81	21.0	345	—	3RD RUN TO SCREEN #4 FINAL PARAMETERS
1305	8.15	1.19	19.6	443	—	1ST RUN TO SCREEN # 3, INITIAL PARAMETERS
1330	—	—	—	—	—	COLLECT MW-991-033
1335	7.98	1.33	20.1	454	—	3RD RUN TO SCREEN # 3, FINAL PARAMETERS
1400	7.81	2.71	20.2	406	—	1ST RUN TO SCREEN # 2, INITIAL PARAMETERS
1425	—	—	—	—	—	COLLECT MW-991-034
1435	7.52	2.90	19.9	413	—	3RD RUN TO SCREEN # 2, FINAL PARAMETERS
			~~20.7~~			
1500	7.69	0.67	20.7	326	—	1ST RUN TO SCREEN # 1; INITIAL PARAMETERS
1525	—	—	—	—	—	COLLECT MW-991-035
1540	7.52	0.17	19.2	317	—	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 : 1572.0265
Date : 2/26/99
Site Engineer : J. BRENNAN / B. FELDPAUSCH
Well Number : MW-19
Equipment : YSI 3500
DRT-ISCE
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	7.88	4.37	16.4	407	—	1ST RUN TO SCREEN #5; INITIAL PARAMETERS
0930	—	—	—	—	—	COLLECT MW-991-026
0945	7.76	3.98	16.4	403	—	3RD RUN TO SCREEN #5; FINAL PARAMETERS
1015	8.27	4.38	17.2	356	—	1ST RUN TO SCREEN #4; INITIAL PARAMETERS
1045	—	—	—	—	—	COLLECT MW-991-027
1100	8.31	3.73	17.5	368	—	3RD RUN TO SCREEN #4; FINAL PARAMETERS
1120	7.69	4.11	18.3	363	—	1ST RUN TO SCREEN #3; INITIAL PARAMETERS
1150	—	—	—	—	—	COLLECT MW-991-028
1150	—	—	—	—	—	-028MS -028MSD
1210	7.92	4.56	18.6	884	—	3RD RUN TO SCREEN #3 FINAL PARAMETERS
1250	6.97	3.94	18.3	460	—	1ST RUN TO SCREEN #2; INITIAL PARAMETERS
1320	—	—	—	—	—	COLLECT MW-991-029
1335	6.57	3.20	18.5	459	—	3RD RUN TO SCREEN #2 FINAL PARAMETERS
1405	7.51	4.99	18.6	261	—	1ST RUN TO SCREEN #1; INITIAL PARAMETERS
1420	—	—	—	—	—	COLLECT MW-991-030
1445	7.53	48.1	17.3	248	—	3RD RUN TO SCREEN #1; FINAL PARAMETERS

Notes Sampling Procedures: _____

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0268
Date : 2/25/99
Site Engineer : J. BRENNER, B. FELDPAUSCH

Well Number : MW-20
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
0920	8.94	1.02	15.9	290	—	1ST RUN TO SCREEN #5; INITIAL PARAMETERS
1000	—	—	—	—	—	COLLECT MW-991-021
1020	8.51	1.67	16.7	302	—	3RD RUN TO SCREEN #5 FINAL PARAMETERS
1105	8.44	0.83	17.2	294	—	1ST RUN TO SCREEN #4; INITIAL PARAMETERS
1130	—	—	—	—	—	COLLECT MW-991-022
1150	8.41	1.68	17.5	290	—	3RD RUN TO SCREEN #4; FINAL PARAMETERS
1225	8.45	0.10	17.3	410	—	1ST RUN TO SCREEN #3; INITIAL PARAMETERS
1230	—	—	—	—	—	COLLECT MW-991-023, -023.MS, -023.MSD (FOR VOCs AND METALS)
1310	8.43	0.28	18.0	429	—	3RD RUN TO SCREEN #3; FINAL PARAMETERS
1335	8.37	0.79	17.4	330	—	1ST RUN TO SCREEN #2; INITIAL PARAMETERS
1400	—	—	—	—	—	COLLECT MW-991-024
1415	7.92	0.48	17.5	356	—	3RD RUN TO SCREEN #2 FINAL PARAMETERS
1440	7.68	0.51	17.8	655	—	1ST RUN TO SCREEN #1; INITIAL PARAMETERS
1500	—	—	—	—	—	COLLECT MW-991-025
1515	7.51	0.92	17.7	679	—	3RD RUN TO SCREEN #1; FINAL PARAMETERS

Notes Sampling Procedures: _____

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0268
Date : 3/16/99
Site Engineer : J. BRANNER, E. MAYER

Well Number : MW-21
Equipment : YSI 3500
DRT-1SCE
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	8.34	4.29	15.1	701	—	1ST RUN TO SCREEN #5, INITIAL PARAMETERS
0920	—	—	—	—	—	COLLECT MW-991-016
0940	7.98	17.7	15.6	705	—	3RD RUN TO SCREEN #5, FINAL PARAMETERS
1000	7.91	13.1	13.4	553	—	1ST RUN TO SCREEN #4, INITIAL PARAMETERS
1020	—	—	—	—	—	COLLECT MW-991-017
1045	7.53	19.07	15.3	593	—	3RD RUN TO SCREEN #4 FINAL PARAMETER
1110	7.54	4.16	16.8	863	—	1ST RUN TO SCREEN #3 INITIAL PARAMETERS
1125	—	—	—	—	—	COLLECT MW-991-018,
					—	-018MS -018MSD
1150	7.32	1.97	17.7	896	—	3RD RUN TO SCREEN #3, FINAL PARAMETERS
1210	7.42	0.04	18.3	1036	—	1ST RUN TO SCREEN #2, INITIAL PARAMETERS
1225	—	—	—	—	—	COLLECT MW-991-019
1245	7.37	0.09	18.6	1041	—	3RD RUN TO SCREEN #2
1305	6.96	0.27	17.4	757	—	1ST RUN TO SCREEN #1, INITIAL PARAMETERS
1315	—	—	—	—	—	COLLECT MW-991-020
1340	6.61	0.13	18.5	765	—	3RD RUN TO SCREEN #1, FINAL PARAMETERS

Notes Sampling Procedures:

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0268
Date : 3/9/99
Site Engineer : J. BIZZINKA, B. FELDPAUSCH
Well Number : MW-22
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
0845	8.49	2.63	18.1	345	—	1ST RUN TO SCREEN #5; INITIAL PARAMETERS
0915	—	—	—	—	—	COLLECT MW-991-011
0930	8.53	2.03	16.2	332	—	3RD RUN TO SCREEN #5; FINAL PARAMETERS
1010	7.47	5.13	17.1	318	—	1ST RUN TO SCREEN #4; INITIAL PARAMETERS
1030	—	—	—	—	—	COLLECT MW-991-012
1050	7.34	4.76	16.3	314	—	3RD RUN TO SCREEN #4; FINAL PARAMETERS
1115	7.49	5.19	17.5	439	—	1ST RUN TO SCREEN #3; INITIAL PARAMETERS
1130	—	—	—	—	—	COLLECT MW-991-013
1150	7.48	4.63	17.5	443	—	3RD RUN TO SCREEN #3; FINAL PARAMETERS
1210	7.43	90.1	17.7	582	—	1ST RUN TO SCREEN #2; INITIAL PARAMETERS
1315	7.50	8.1	17.9	579	—	2ND RUN; AFTER PURGING APPROX. 2.5 GALS
1315	—	—	—	—	—	COLLECT MW-991-014
1330	7.25	5.6	18.4	632	—	3RD RUN, TO SCREEN #2; FINAL PARAMETERS
1350	6.75	54.5	16.7	983	—	1ST RUN TO SCREEN #1; INITIAL PARAMETERS
1430	6.70	20.1	17.0	985	—	2ND RUN; AFTER PURGING 1 GAL
1430	—	—	—	—	—	COLLECT MW-991-015 015MS 015MSD
1500	6.70	32.1	16.5	980	—	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 : 1572.0268
Date : 3/11/99
Site Engineer : J. BRENNER, B. FELDPAUSCH

Well Number : MW-23
Equipment : YSI 3500
DRT-1SCT
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PROBE 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	8.97	3.19	15.8	497	—	1ST RUN TO SCREEN # 5; INITIAL PARAMETERS
0920	—	—	—	—	—	COLLECT MW-991-006
0940	9.30	2.19	17.3	470	—	3RD RUN TO SCREEN # 5; FINAL PARAMETERS
1005	7.70	5.07	17.7	330	—	1ST RUN TO SCREEN #4; INITIAL PARAMETERS
1020	—	—	—	—	—	COLLECT MW-991-007
1045	7.55	3.34	16.1	320	—	3RD RUN TO SCREEN #4; FINAL PARAMETERS
1105	7.51	4.31	17.3	421	—	1ST RUN TO SCREEN # 3; INITIAL PARAMETERS
1130	—	—	—	—	—	COLLECT MW-991-008, -008MS AND -008MSD
1150	7.32	4.73	16.7	423	—	3RD RUN TO SCREEN # 3; FINAL PARAMETERS
1215	6.92	2.53	16.6	892	—	1ST RUN TO SCREEN # 2; INITIAL PARAMETERS
1230	—	—	—	—	—	COLLECT MW-991-009
1245	7.01	1.90	17.9	904	—	3RD RUN TO SCREEN #2; FINAL PARAMETERS
1300	6.54	4.24	17.5	887	—	1ST RUN TO SCREEN #1; INITIAL PARAMETERS
1315	—	—	—	—	—	COLLECT MW-991-010
1330	6.98	3.73	17.3	917	—	3RD RUN TO SCREEN #1; FINAL PARAMETERS

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPC
Project Number : 1572.0268
Date : 3/18/99
Site Engineer : J. BRENNER, D. PIZZIN

Well Number : MW-24
Equipment : DRUM15E
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	*SEE PRESS. PROBE 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
1410	8.37	34.5	22.2	419	—	1ST RUN TO SCREEN #3 AFTER PURGING ABOVE 1 PACKER
						VOLUME
1425	—	—	—	—	—	COLLECT MW-991-003
1450	8.28	57.3	21.3	423	—	3RD RUN TO SCREEN #3 / FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0268
Date : 3/12/99
Site Engineer : J. BRENNER, B. FELDPAUSCH
Well Number : MW-24
Equipment : DIRT-ISCE
YSI-3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESS. PROBE 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
0845	8.25	46.7	17.8	370	—	1ST RUN TO SCREEN #5, INITIAL PARAMETERS
0915	7.70	5.70	18.8	374	—	2ND RUN TO PROVE TURBIDITY
0930	—	—	—	—	—	COLLECT MW-991-001
1010	7.85	4.71	18.6	371	—	4TH RUN TO SCREEN # 5, FINAL PARAMETERS
1045	8.74	6.1	19.2	321	—	1ST RUN TO SCREEN #4, INITIAL PARAMETERS
1100	—	—	—	—	—	COLLECT MW-991-002
1130	8.82	5.7	19.9	326	—	3RD RUN TO SCREEN #4, FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0269
Date : 3/17/99
Site Engineer : J. BRENNER, I. MAYES
Well Number : MW-24
Equipment : DRT-15CE
TSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRES. 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
1230	7.96	121.5	19.1	413	—	1ST RUN TO SCREEN #3 INITIAL PARAMETERS
						*WILL RUN ON LATER
1250	8.55	4.17	18.6	351	—	1ST RUN TO SCREEN #2 INITIAL PARAMETERS
1320	—	—	—	—	—	COLLECT MW-991-004
1340	8.53	41.2	19.4	357	—	3RD RUN TO SCREEN #2, FINAL PARAMETERS
1400	8.00	7.63	18.9	360	—	1ST RUN TO SCREEN #1 INITIAL PARAMETERS
1415	—	—	—	—	—	COLLECT MW-991-005
1515	7.87	4.29	16.6	349	—	FINAL RUN TO SCREEN #1 FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 2/19/99 | Job No.: 1572

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

Elevation of atum(ft msl): 1100.34 | Range: 0 to 750 psia | Weather: 65 degrees, overcast | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.04/18.01/1001 | Finish: 13.93/20.09/1015

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	653	161.58			21.72	1005		124.74	975.60
			242.99						
			242.98						
			242.99						
				161.51					
4	558	120.20			22.60	1007		116.58	983.76
			205.31						
			205.37						
			205.34						
				120.19					
3	346	28.03			21.81	1009		104.27	996.07
			118.76						
			118.77						
			118.80						
				28.10					
2	252	13.92			20.90	1011		106.04	994.30
			77.23						
			77.26						
			77.29						
				13.93					
1	172	13.90			20.21	1013		100.09	1000.25
			45.15						
			45.16						
			45.16						
				13.93					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 2/19/99 | 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: 65 degrees, overcast | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.01/17.80/1020 | Finish: 14.08/20.50/1035

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	125.69			20.45	1023		98.07	984.77
			193.94						
			193.90						
			193.91						
				125.58					
4	392	72.87			21.53	1025		88.74	994.10
			145.50						
			145.53						
			145.50						
				72.84					
3	322	42.35			21.40	1027		87.34	995.50
			115.76						
			115.79						
			115.76						
				42.41					
2	240	13.92			20.93	1029		87.16	995.68
			80.31						
			80.28						
			80.31						
				13.89					
1	150	13.93			20.64	1031		79.88	1002.96
			44.43						
			44.46						
			44.43						
				13.93					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 2/19/99 | 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: 65 degrees, overcast | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.96/19.24/0730 | Finish: 13.93/19.06/0747

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	158.43			21.90	785		156.95	982.35
			222.92						
			222.92						
			222.91						
				158.41					
4	524	109.32			21.60	738		146.86	992.44
			177.42						
			177.46						
			177.43						
				109.35					
3	429	69.28			20.25	741		142.70	996.60
			138.03						
			138.07						
			138.07						
				69.32					
2	259	13.99			19.50	743		136.70	1002.60
			66.94						
			66.97						
			66.97						
				14.01					
1	149	13.96			19.18	745		113.46	1025.84
			29.32						
			29.38						
			29.35						
				13.99					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 2/19/99 | Job No.: 1572

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

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

Weather: 65 degrees, overcast | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.93/19.17/1020 | Finish: 14.01/18.09/1035

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	189.30			20.73	1024		115.81	986.33
			201.34						
			201.32						
			201.31						
				189.31					
4	436	140.54			20.87	1026		107.38	994.76
			156.41						
			156.44						
			156.43						
				140.56					
3	323	91.34			19.86	1028		105.27	996.87
			108.36						
			108.34						
			108.37						
				91.41					
2	243	56.59			19.11	1030		104.25	997.89
			74.13						
			74.10						
			74.13						
				56.60					
1	140	14.08			18.15	1032		91.24	1010.90
			35.11						
			35.07						
			35.14						
				14.05					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 2/19/99 | 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: 65 degrees, overcast | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.95/20.68/1120 | Finish: 13.93/20.07/1135

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	175.47			21.22	1125		163.04	1010.43
			177.37						
			177.33						
			177.36						
				175.45					
4	456	138.75			21.48	1127		163.22	1010.25
			140.87						
			140.84						
			140.87						
				138.77					
3	382	106.72			21.20	1129		163.39	1010.08
			108.69						
			108.70						
			108.73						
				106.76					
2	277	60.73			20.39	1131		164.10	1009.37
			62.89						
			62.86						
			62.89						
				60.71					
1	207	30.31			20.14	1133		164.58	1008.89
			32.31						
			32.34						
			32.34						
				30.30					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 2/19/99 | 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: 65 degrees, overcast | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.95/18.30/0803 | Finish: 14.05/16.40/0818

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	171.75			19.81	806		218.16	973.05
			234.15						
			234.12						
			234.17						
				171.70					
4	582	109.02			19.25	809		210.44	980.77
			175.08						
			175.06						
			175.07						
				109.07					
3	468	59.52			17.94	811		208.28	982.93
			126.59						
			126.60						
			126.57						
				59.56					
2	370	16.91			17.12	813		203.43	987.78
			86.21						
			86.19						
			86.22						
				16.94					
1	250	14.13			16.60	815		200.50	990.71
			35.48						
			35.45						
			35.45						
				14.15					

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: 2/19/99 | Job No.: 1572

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

Elevation of atum(ft msl): 1225.41 | Range: 0 to 750 psia | Weather: 65 degrees, overcast | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.06/16.87/0820 | Finish: 14.01/18.18/0835

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	148.67			19.98	825		260.67	964.74
			197.54						
			197.58						
			197.52						
				148.68					
4	564	96.43			20.66	827		246.66	978.75
			151.59						
			151.62						
			151.59						
				96.42					
3	424	35.52			19.66	829		238.44	986.97
			94.45						
			94.49						
			94.49						
				35.56					
2	330	14.02			18.71	831		241.06	984.35
			52.58						
			52.61						
			52.58						
				14.33					
1	270	14.01			18.28	833		241.89	983.52
			26.23						
			26.20						
			26.23						
				14.00					

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: 2/19/99 | Job No.: 1572

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

Elevation of atum(ft msl): 1142.94 | Range: 0 to 750 psia | Weather: 65 degrees, overcast | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.13/17.58/0912 | Finish: 14.08/18.17/0925

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	88.75			18.46	915		160.85	982.09
			160.27						
			160.24						
			160.27						
				88.76					
4	444	65.17			18.30	917		160.73	982.21
			136.89						
			136.92						
			136.90						
				65.21					
3	392	42.60			18.42	919		156.96	985.98
			116.01						
			115.98						
			115.99						
				42.57					
2	314	14.08			18.47	921		157.89	985.05
			81.77						
			81.80						
			81.77						
				14.11					
1	242	14.05			18.25	923		158.37	984.57
			50.38						
			50.35						
			50.35						
				14.11					

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: 2/19/99 | Job No.: 1572

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

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

Weather: 65 degrees, overcast | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.04/17.73/0845 | Finish: 14.07/17.92/0900

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	264.61			21.73	848		194.91	970.14
			319.70						
			319.71						
			319.72						
				264.60					
4	700	177.74			22.46	850		214.14	950.91
			224.67						
			224.71						
			224.64						
				177.62					
3	562	117.62			21.85	852		192.15	972.90
			174.41						
			174.38						
			174.36						
				117.68					
2	392	43.90			20.21	854		191.87	973.18
			100.83						
			100.80						
			100.81						
				43.91					
1	230	14.08			18.08	856		193.79	971.26
			29.76						
			29.73						
			29.76						
				14.08					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 2/19/99 | Job No.: 1572

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

Elevation of atum(ft msl): 1059.10 | Range: 0 to 750 psia | Weather: 65 degrees, overcast | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.74/20.94/1205 | Finish: 13.93/19.59/1217

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	136.33			20.69	1207		56.76	1002.34
			150.50						
			150.47						
			150.50						
				136.35					
4	310	109.27			20.70	1209		56.84	1002.26
			123.59						
			123.59						
			123.56						
				109.31					
3	240	79.27			20.29	1211		56.00	1003.10
			93.61						
			93.58						
			93.61						
				79.32					
2	161	44.85			19.82	1213		56.44	1002.66
			59.17						
			59.14						
			59.17						
				44.90					
1	90	13.96			19.62	1215		59.20	999.90
			27.20						
			27.16						
			27.20						
				13.96					

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: 2/19/99 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: 65 degrees, overcast Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.93/19.65/1140 Finish: 13.86/20.71/1155

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	588	164.42			21.77	1145		179.51	997.47
			190.98						
			190.99						
			190.96						
				164.40					
4	467	111.81			22.06	1147		176.28	1000.70
			139.91						
			139.94						
			139.92						
				111.76					
3	389	77.79			21.89	1149		172.33	1004.65
			107.85						
			107.82						
			107.79						
				77.78					
2	329	51.79			21.20	1151		172.56	1004.42
			81.70						
			81.73						
			81.70						
				51.81					
1	245	14.77			20.84	1153		176.50	1000.48
			43.58						
			43.61						
			43.58						
				14.75					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 2/19/99 | Job No.: 1572

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

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

Weather: 65 degrees, overcast | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.95/20.18/0705 | Finish: 13.87/20.03/0720

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	192.15			20.20	707		113.63	995.21
			199.62						
			199.61						
			199.60						
				192.11					
4	445	149.96			20.83	710		112.50	996.34
			158.04						
			158.07						
			158.04						
				149.97					
3	319	95.35			20.61	712		108.41	1000.43
			105.22						
			105.19						
			105.19						
				95.38					
2	254	67.30			20.46	714		108.66	1000.18
			76.90						
			76.93						
			76.91						
				67.27					
1	174	32.50			20.02	717		109.76	999.08
			41.73						
			41.76						
			41.79						
				32.50					

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: 2/19/99 | Job No.: 1572

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

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

Weather: 65 degrees, overcast | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.96/19.57/1055 | Finish: 13.83/21.35/1110

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	678	185.20			21.57	1059		209.60	991.34
			216.93						
			216.96						
			216.95						
				185.21					
4	554	131.29			22.20	1101		205.68	995.26
			164.87						
			164.90						
			164.91						
				131.33					
3	435	79.52			22.23	1103		201.68	999.26
			115.04						
			115.07						
			115.01						
				79.50					
2	373	52.58			21.99	1105		201.72	999.22
			88.15						
			88.12						
			88.16						
				52.56					
1	279	13.79			21.60	1107		201.30	999.64
			47.61						
			47.55						
			47.58						
				13.83					

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: 3/24/99 | Job No.: 1572

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

Elevation of atum(ft msl): 1100.34 | Range: 0 to 750 psia | Weather: 60 degrees, sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.90/19.16/0950 | Finish: 13.96/20.36/1005

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	161.43			21.52	954		124.74	975.60
			247.95						
			247.91						
			247.96						
				161.35					
4	558	120.02			22.56	956		116.58	983.76
			208.85						
			208.82						
			208.85						
				120.08					
3	346	27.88			21.55	958		104.27	996.07
			119.84						
			119.81						
			119.85						
				27.90					
2	252	13.89			20.91	1000		106.04	994.30
			79.19						
			79.16						
			79.19						
				13.90					
1	172	13.93			20.43	2		100.09	1000.25
			46.37						
			46.40						
			46.37						
				13.95					

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: 3/24/99 | Job No.: 1572

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

Elevation of datum(ft msl): 1082.84 | Range: 0 to 750 psia | Weather: 60 degrees, sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.99/17.92/1032 | Finish: 13.90/20.40/1045

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	513	125.40			21.56	1035		98.07	984.77
			197.11						
			197.16						
			197.15						
				125.38					
4	392	72.63			21.77	1037		88.74	994.10
			147.68						
			147.71						
			147.68						
				72.67					
3	322	42.15			21.62	1039		87.34	995.50
			117.67						
			117.64						
			117.67						
				42.19					
2	240	13.86			21.20	1041		87.16	995.68
			82.12						
			82.16						
			82.13						
				13.92					
1	150	13.79			20.53	1043		79.88	1002.96
			45.52						
			45.55						
			45.52						
				13.93					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 3/24/99 | 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: 60 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.59/23.33/1115 | Finish: 13.99/18.58/1130

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	224.92			22.28	1119		156.94	982.36
			226.39						
			226.36						
			226.39						
				225.89					
4	524	175.25			22.12	1121		146.86	992.44
			181.02						
			181.05						
			181.02						
				175.26					
3	429	134.47			20.62	1123		142.70	996.60
			140.51						
			140.55						
			140.51						
				134.53					
2	259	60.88			19.55	1125		136.70	1002.60
			68.96						
			68.94						
			68.97						
				60.89					
1	149	14.02			18.83	1127		113.46	1025.84
			30.39						
			30.42						
			30.42						
				14.01					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 3/24/99 | Job No.: 1572

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

Elevation of atum(ft msl): 1102.14 | Range: 0 to 750 psia | Weather: 60 degrees, sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.01/16.17/1015 | Finish: 14.05/18.13/1030

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	207.65			21.62	1020		115.81	986.33
			204.63						
			204.60						
			204.62						
				207.61					
4	436	158.91			21.38	1022		107.38	994.76
			158.81						
			158.81						
			158.81						
				158.93					
3	323	109.71			20.25	1024		105.27	996.87
			110.29						
			110.33						
			110.27						
				109.76					
2	243	74.98			19.35	1026		104.25	997.89
			75.96						
			75.93						
			75.96						
				74.96					
1	140	30.07			18.50	1028		91.24	1010.90
			35.45						
			35.41						
			35.45						
				30.11					

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: 3/24/99 | 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: 60 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.83/21.19/1345 | Finish: 13.87/20.35/1402

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	174.89			23.41	1352		163.04	1010.43
			178.89						
			178.86						
			178.86						
				174.90					
4	456	138.33			22.51	1354		163.22	1010.25
			142.40						
			142.38						
			142.38						
				138.36					
3	382	106.16			21.79	1356		163.39	1010.08
			110.28						
			110.25						
			110.28						
				106.19					
2	277	60.44			20.80	1358		164.10	1009.37
			64.49						
			64.46						
			64.49						
				60.48					
1	207	29.96			20.44	1400		164.58	1008.89
			33.96						
			33.99						
			33.96						
				29.93					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 3/24/99 | Job No.: 1572

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

Elevation of atum(ft msl): 1191.21 | Range: 0 to 750 psia | Weather: 60 degrees, sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.17/12.85/0745 | Finish: 14.05/16.26/0803

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	726	188.59			17.56	750		218.16	973.05
			239.07						
			239.06						
			239.05						
				188.60					
4	582	125.83			18.01	752		210.44	980.77
			178.79						
			178.77						
			178.77						
				125.92					
3	468	76.38			16.94	755		208.28	982.93
			129.35						
			129.38						
			129.38						
				76.36					
2	370	33.67			16.50	757		203.43	987.78
			88.49						
			88.49						
			88.52						
				33.70					
1	250	14.11			16.29	759		200.50	990.71
			37.98						
			38.02						
			37.98						
				14.09					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 3/24/99 | 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: 60 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.05/18.09/0835 | Finish: 14.08/18.02/0845

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	684	148.34			19.37	838		260.67	964.74
			203.01						
			203.02						
			203.01						
				148.30					
4	564	96.02			20.20	840		246.66	978.75
			155.37						
			155.40						
			155.39						
				96.05					
3	424	35.18			19.50	842		238.44	986.97
			96.86						
			96.90						
			96.90						
				35.19					
2	330	14.05			18.62	845		241.06	984.35
			55.17						
			55.21						
			55.18						
				14.02					
1	270	14.02			18.13	847		241.89	983.52
			28.95						
			28.92						
			28.95						
				14.03					

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: 3/24/99 | Job No.: 1572

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

Elevation of atum(ft msl): 1142.94 | Range: 0 to 750 psia | Weather: 60 degrees, sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 14.08/17.98/0930 Finish: 14.08/18.18/0945

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	88.74			18.33	933		153.36	989.58
			163.49						
			163.46						
			163.49						
				88.71					
4	444	65.14			18.22	935		153.32	989.62
			140.11						
			140.05						
			140.11						
				65.18					
3	392	42.52			18.34	937		152.16	990.78
			118.04						
			118.07						
			118.04						
				42.51					
2	314	14.02			18.36	939		153.35	989.59
			83.73						
			83.70						
			83.73						
				14.03					
1	242	14.05			18.23	941		154.36	988.58
			52.06						
			52.09						
			52.06						
				14.12					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 3/24/99 | Job No.: 1572

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

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

Weather: 60 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.94/17.33/0900 | Finish: 14.11/18.40/0915

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	264.22			22.58	904		194.91	970.14
			321.76						
			321.79						
			321.78						
				264.16					
4	700	177.24			22.64	906		214.14	950.91
			230.96						
			230.97						
			230.94						
				177.27					
3	562	117.25			21.85	908		192.15	972.90
			176.67						
			176.70						
			176.68						
				117.26					
2	392	43.37			19.97	910		191.87	973.18
			102.62						
			102.63						
			102.63						
				43.39					
1	230	14.15			18.67	912		193.79	971.26
			31.60						
			31.57						
			31.60						
				14.11					

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: 3/24/99 | Job No.: 1572

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

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

Weather: 60 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.89/16.98/1410 | Finish: 13.99/19.88/1425

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	372	135.88			21.93	1415		56.76	1002.34
			152.01						
			152.01						
			151.98						
				135.83					
4	310	108.83			21.45	1417		56.84	1002.26
			125.17						
			125.14						
			125.15						
				108.89					
3	240	78.78			20.73	1419		56.00	1003.10
			95.14						
			95.11						
			95.17						
				78.83					
2	161	44.40			20.18	1421		56.44	1002.66
			60.71						
			60.68						
			60.72						
				44.41					
1	90	13.93			19.90	1423		59.20	999.90
			28.75						
			28.82						
			28.82						
				13.90					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 3/24/99 | 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: 60 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.94/21.01/155 | Finish: 13.83/20.99/1210

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	178.05			22.34	1200		179.51	997.47
			193.33						
			193.36						
			193.32						
				178.02					
4	467	125.47			22.30	1202		176.28	1000.70
			142.06						
			142.03						
			142.07						
				125.51					
3	389	91.62			22.13	1204		172.33	1004.65
			109.54						
			109.57						
			109.54						
				91.63					
2	329	65.63			21.73	1206		172.56	1004.42
			83.44						
			83.47						
			83.44						
				65.67					
1	245	28.76			21.15	1208		176.50	1000.48
			45.63						
			45.60						
			45.63						
				28.77					

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: 3/24/99 | Job No.: 1572

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

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

Weather: 60 degrees, sunny | Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.90/19.17/1050 | Finish: 13.93/20.44/1110

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	191.92			21.93	1057		113.63	995.21
			202.32						
			202.35						
			202.34						
				191.90					
4	445	149.88			22.02	1059		112.50	996.34
			160.54						
			160.57						
			160.58						
				149.89					
3	319	95.28			21.50	1101		108.41	1000.43
			107.20						
			107.23						
			107.20						
				95.25					
2	254	67.14			20.68	1104		108.66	1000.18
			78.95						
			78.92						
			78.95						
				67.15					
1	174	32.30			20.46	1106		109.76	999.08
			43.87						
			43.84						
			43.87						
				32.36					

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: 3/24/99 | Job No.: 1572

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

Elevation of atum(ft msl): 1200.94 | Range: 0 to 750 psia | Weather: 60 degrees, sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: J. Brenner / M. Losi

Ambient Reading (Pressure/Temperature/Time) Start: 13.93/20.00/1135 | Finish: 13.91/20.66/1150

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	205.66			21.67	1140		209.60	991.34
			219.78						
			219.77						
			219.79						
				205.64					
4	554	151.84			22.09	1142		205.68	995.26
			167.34						
			167.31						
			167.34						
				151.85					
3	435	100.19			22.13	1144		201.68	999.26
			116.91						
			116.94						
			116.91						
				100.18					
2	373	73.31			21.99	1146		201.72	999.22
			89.99						
			90.02						
			90.02						
				73.34					
1	279	32.54			20.83	1148		201.30	999.64
			49.69						
			49.72						
			49.72						
				32.57					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: SPL Location: MW-3 Depth: 172' Date: 3/3/94

Well Name: MW-3 Sampling Zone No.: 1 Starting Time: 1022 Finishing Time: 1115

Technicians D. DIRKIN, B FEIDBAUSUT, D TIETJE

Water Level Inside MP Casing (Beginning of Session) 14.10 PSIA (End of Session) 14.08 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	✓	✓	✓	✓	✓	✓	14.10	✓	1027	1030	✓	14.12	1.0	1ST RUN TO SCREEN 1, INITIAL PARAMETERS, NTUs = 4.73
2	✓	✓	✓	✓	-	✓	14.12	✓	1046	1049	✓	14.11	1.0	2nd RUN, VOCs, METALS, ANIONS, ½ CAP
3	✓	✓	✓	✓	✓	✓	13.97	✓	1104	1106	✓	14.08	0.75	3rd RUN COMPLETE SAMPLE COLLECTION, FINAL PARAMETERS NTUs: 6.9
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: H_2O press. outside mp - 46.29

Total Volume: 2.75 L F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 252 Date: 3/3/99

Well Name: MW-3 Sampling Zone No.: 2 Starting Time: 0913 Finishing Time: 1015

Technicians D. DIRKIN, B. FEIDBAUCH, D. ~~FIELD~~ TIETJE

Water Level Inside MP Casing (Beginning of Session) 14.14 (PSIA) (End of Session) 14.12 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.14	✓	919	921	✓	14.15	1.0	1ST RUN TO SCREEN OUT, INITIAL PARAMETERS NTUs = 2.15
2	✓	✓	✓	✓	✓	✓	14.20	✓	937	941	✓	14.17	1.0	2nd RUN COLLECT SAMPLES, VOCs, METALS, ANIONS, 1/2 GAL
3	✓	✓	✓	✓	✓	✓	14.15	✓	1004	1007	✓	14.12	.75	CHK, CLEAR, FINAL PARAMETERS NTUs = 2.91
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: High Pressure Above MP 78.85

Total Volume: 2.75 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 346 Date: 3/3/99

Well Name: MW-3 Sampling Zone No.: 3 Starting Time: 0714 Finishing Time: 0821

Technicians D. DIRKIN / B. FEIDBAUSCH

Water Level Inside MP Casing (Beginning of Session) 29.91 PSIA (End of Session) 30.01

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	29.91	✓	0724	0726	✓	29.92	1.0	1ST RUN TO SLUDGE #3, INITIAL PARAMETERS NTUs = 3.18
2	✓	✓	✓	✓	✓	✓	29.98	✓	0749	0751	✓	29.98	1.0	2nd Run, COLLECT MW-991-076, VOCs, METALS, ~~ANIONS~~, ~~CARB~~ MS/MSD FOR VOCs & METALS
3	✓	✓	✓	✓	✓	✓	30.01	✓	0813	0816	✓	30.01	1.0	3rd Run; COLLECT ANIONS, CARB, CIOy and FINAL PARAMETERS NTUs = 2.25
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: H_2O LEVEL OUTSIDE MP = 119.08 Total Volume: 3.0

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 558 Date: 3/2/99

Well Name: MW-3 Sampling Zone No.: 4 Starting Time: 1515 Finishing Time: 1630

Technicians: B. FeldPausch & D. Darbin

Water Level Inside MP Casing (Beginning of Session) 122.08 PSIA (End of Session) 121.95 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	122.08	✓	1520	1521	✓	122.08	.5	1ST RUN; INITIAL PARAMETERS NTUs = 5.53
2	✓	✓	✓	✓	✓	✓	122.04	✓	1545	1547	✓	122.01	1.0	2nd RUN; MW-991-075; 2 VOAs, METALS, ANIONS & ½ ~~CLO4~~ CrVI
3	✓	✓	✓	✓	✓	✓	121.99	✓	1612	1614	✓	121.95	1.0	3rd RUN, CrVI6, ClO4 and Final Parameters NTUs = 3.53
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: H_2O PRESSURE OUTSIDE MP = 191.19

Total Volume: 2.5 l

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 653 Date: 3/2/99

Well Name: MW-3 Sampling Zone No.: 5 Starting Time: 1333 Finishing Time: 1510

Technicians B. FEIOPAUSH, D. DINKIN

Water Level Inside MP Casing (Beginning of Session) ~~13.8 PSIA~~ 163.45 PSIG (End of Session) 163.30 PSIG

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	✓	✓	✓	✓	✓	✓	163.45	✓	1346	1347	✓	163.45	1.0	1ST RUN, INITIAL PARAMETERS; NTUs = 4.43
2	✓	✓	✓	✓	✓	✓	163.40	✓	1421	1422	✓	163.47	1.0	2nd RUN; COLLECT MW-991-074; 2 VOAS, METALS, ANIONS, CrVI
3	✓	✓	✓	✓	✓	✓	163.45	✓	1450	1451	✓	163.30	0.5	3RD RUN; CLOY; FINAL PARAMETERS NTUs = 4.38
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: H₂O PSI outside MP = 232.12

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: 3/8/07

Well Name: MW-4 Sampling Zone No.: 1 Starting Time: 1150 Finishing Time: 1245

Technicians J. BRENNER, B. FELDBUSCH

Water Level Inside MP Casing (Beginning of Session) ~~14.59~~ 13.89 PSIA (End of Session) 14.02 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~~ 13.89	✓	1203	1208	✓	14.17	1.0	1ST RUN; INITIAL PARAMETERS MTW'S = 1.33
2	✓	✓	✓	✓	✓	✓	13.66	✓	1221	1226	✓	14.05	1.0	2ND RUN; COLLECT MW-9991-0712 2 VOAS METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	14.03	✓	1239	1243	✓	14.02	1.0	3RD RUN; Cr^{6+}, ClO_4; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRES. OUTSIDE MP CASING = 44.37 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-4 Depth: 240 Date: 3/17/99

Well Name: MW-4 Sampling Zone No.: 2 Starting Time: 0900 Finishing Time: 1050

Technicians J. BRENNER; I. MAYES

Water Level Inside MP Casing (Beginning of Session) 14.17 (PSIA) (End of Session) 14.11 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.17	✓	0907	0910	✓	14.18	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 6.1
2	✓	✓	✓	✓	✓	✓	14.16	✓	0923	0926	✓	14.19	1.0	2ND RUN; COLLECT MW-9911-072 & MW-9911-071; 4 VOAS, 1 DIOXANE
3	✓	✓	✓	✓	✓	✓	14.15	✓	0943	0946	✓	14.13	1.0	3RD RUN; 3/4 NDMA
4	✓	✓	✓	✓	✓	✓	14.12	✓	1002	1005	✓	14.16	1.0	4TH RUN; 1/4 NDMA, 2 METALS
5	✓	✓	✓	✓	✓	✓	14.09	✓	1021	1024	✓	14.10	1.0	5TH RUN; ANIONS; 2 HEX. CR.
6	✓	✓	✓	✓	✓	✓	14.11	✓	1041	1044	✓	14.11	0.5	6TH RUN; 2C104; FINAL PARAMETERS;
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 76.93 (PSIA) Total Volume: 5.5

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 322 Date: 3/8/99

Well Name: MW-4 Sampling Zone No.: 3 Starting Time: 1055 Finishing Time: 1145

Technicians J. BRENNER, B. FELDPAUSCH

Water Level Inside MP Casing (Beginning of Session) 44.19 (End of Session) 44.15

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	✓	✓	✓	✓	✓	✓	44.19	✓	1104	1106	✓	44.22	1.0	1ST RUN, INITIAL PARAMETERS, NTU'S = 2.92
2	✓	✓	✓	✓	✓	✓	44.19	✓	1122	1124	✓	44.21	1.0	2ND RUN, COLLECT MW-991-070, -070MS, 070-MSD, 6VOAS, 2METALS
3	✓	✓	✓	✓	✓	✓	44.14	✓	1140	1142	✓	44.15	1.0	3RD RUN, ANIONS, Cr^{6+}, ClO4, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 10.89 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-4 Depth: 392 Date: 3/8/99

Well Name: MW-4 Sampling Zone No.: 4 Starting Time: 0950 Finishing Time: 1050

Technicians J. BRENNER, B. KEUDITAUSCH

Water Level Inside MP Casing (Beginning of Session) 74.78 (PS.A) (End of Session) 74.72 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	74.78	✓	0959	1002	✓	74.79	1.0	1ST RUN; INITIAL PARAMETERS; MNS = 3.33
2	✓	✓	✓	✓	✓	✓	74.75	✓	1020	1022	✓	74.73	1.0	2ND RUN; COLLECT MW-9911-0609 2 VOAS, METALS, ANIONS, C-64
3	✓	✓	✓	✓	✓	✓	74.71	✓	1043	1045	✓	74.72	1.0	3RD RUN; C104; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 137.41 PS.A

Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 513 Date: 3/8/99

Well Name: MW-4 Sampling Zone No.: 5 Starting Time: 0830 Finishing Time: 0945

Technicians J. BRENNER, B. FELDPAUSCH

Water Level Inside MP Casing (Beginning of Session) 127.43 PSIA (End of Session) 126.38

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	✓	✓	✓	✓	✓	✓	127.43	✓	0814	0846	✓	127.47	1.0	1ST RUN; INITIAL PARAMETERS; NTUs = 2.39
2	✓	✓	✓	✓	✓	✓	127.43	✓	0908	0910	✓	127.46	1.0	2ND RUN; COLLECT MW-99R-0609 2VOAs, METALS, ANIONS, C-64
3	✓	✓	✓	✓	✓	✓	126.41	✓	0932	0934	✓	126.38	0.5	3RD RUN; C104; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 157.62 PSIA

Total Volume: 2.5 L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 149 Date: 3/5/99

Well Name: MW-11 Sampling Zone No.: 1 Starting Time: 1345 Finishing Time: 1425

Technicians D. DIRKIN & B. FEIDBAUSCH

Water Level Inside MP Casing (Beginning of Session) 15.43 (End of Session) 15.38

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	✓	✓	✓	✓	✓	✓	15.43	✓	1347	1350	✓	15.45	1.0	1ST RUN TO SCAN - INITIAL PARAM. H_2S: 1.64
2	✓	✓	✓	✓	✓	✓	15.36	✓	1402	1405	✓	15.40	1.0	2nd RUN - COLLECT SAMPLE VOCs, METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	15.40	✓	1418	1422	✓	15.38	1.0	3rd RUN, COLLECT SAMPLE, Cr^{+6}, ClO_4 and final param.
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: Hyd Press. Outside MP = 30.27 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-11 Depth: 259 Date: 3/5/99

Well Name: MW-11 Sampling Zone No.: 2 Starting Time: 1205 Finishing Time: 1337

Technicians D. DIRKIN & B. FEINBAUSCH

Water Level Inside MP Casing (Beginning of Session) 63.02 PSIA (End of Session) 63.01

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	✓	✓	✓	✓	✓	✓	63.02	✓	1221	1223	✓	63.02	1.0	1ST RUN TO SCREEN #2, INITIAL PARAM. NTUs - 12.85
2	✓	✓	✓	✓	✓	✓	63.02	✓	1242	1245	✓	63.02	1.0	2nd RUN TO SCREEN 3 - PARAMETERS STABILIZING NO RECHARGE "FLOWED". NTUs - 12.8
3	✓	✓	✓	✓	✓	✓	63.02	✓	1307	1310	✓	63.03	1.0	3rd RUN, COLLECT SAMPLE, VOCs, METALS 1/2 ANIONS
4	✓	✓	✓	✓	✓	✓	63.03	✓	1325	1329	✓	63.01	1.0	4th RUN COLLECT SAMPLE, ANIONS, CYN, CLAY & FINAL PARAM.
5														
6														
7														
8														
9														
10														
11														
12														

Comments: Hyd Press. Inside mp: 66.09

Total Volume: 4.01

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 429 Date: 3/5/99

Well Name: MW-11 Sampling Zone No.: 3 Starting Time: 1100 Finishing Time: 1205

Technicians D. DIRKIN & B. FEIDBAUSCH

Water Level Inside MP Casing (Beginning of Session) 136.74 PSIA (End of Session) 135.65 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	136.74	✓	1107	1110	✓	136.74	1.0	1ST RUN TO SCREEN 3. INITIAL PARAMETERS NO2 = 2.63
2	✓	✓	✓	✓	✓	✓	136.74	✓	1131	1134	✓	136.71	1.0	2nd RUN - COLLECT SAMPLE, VOCs, METALS, ANIONS & 1/2 Cr+6
3	✓	✓	✓	✓	✓	✓	135.67	✓	1200	1201	✓	135.65	0.5	3rd RUN TO SCREEN 3, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: High Press. outside MP = 134.07 Total Volume: 2.5 l

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 524 Date: 3/5/99

Well Name: MW-11 Sampling Zone No.: 4 Starting Time: 0930 Finishing Time: 1050

Technicians D. DIRKIN & B. FEIDBANSCH

Water Level Inside MP Casing (Beginning of Session) 177.67 DTW (End of Session) 177.10 DTW

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	✓	✓	✓	✓	✓	✓	177.67	✓	0934	0941	✓	177.61	1.0	1ST Purge Screen #5 INITIAL parameters, NTU = 1.64
2	✓	✓	✓	✓	✓	✓	177.67	✓	1006	1009	✓	177.67	1.0	2nd Run Collect Sample MW-991-0507 ~~HEA~~ VOC, metals, Anions
3	✓	✓	✓	✓	✓	✓	177.09	✓	1037	1040	✓	177.10	1.0	3rd Run for Screen 4: Color, clarity and final parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: H_2O Press. override mp = 174.51

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: 639 Date: 3/5/99

Well Name: MW - 11 Sampling Zone No.: 5 Starting Time: 0723 Finishing Time: 0920

Technicians D. DIRKIN & B. FELDBAUSCH

Water Level Inside MP Casing (Beginning of Session) 228.67 (End of Session) 227.16

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	228.67	✓	734	736	✓	228.71	1.0	1ST RUN TO SCREEN #1; INITIAL PARAMETERS NTUs = 4.13
2*	✓	✓	✓	✓	✓	—								NO SAMPLE. NO Recirc. BOTTLES FILLED W/ WELL H2O. Valve opened.
3	✓	✓	✓	✓	✓	✓	227.21	✓	0841	0843	✓	227.21	1.0	2nd RUN - COLLECT SAMPLE MW-99L-05G METALS MS/MSD & ANIONS
4	✓	✓	✓	✓	✓	✓	227.16	✓	0908	0912	✓	227.16	1.0	3rd RUN TO SCREEN 5. COLLECT VOA (MS/MSD) CRT6, alcy and final parameters.
5														
6														
7														
8														
9														
10														
11														
12														

Comments: H2O Press. Outside mp: 198.09

Total Volume: 3.0 l F2

* Power failure from building power source; upon restart valve opened and filled with well water. Therefor, canceled run and switched out sample bottles.

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 140 Date: 3/1/99

Well Name: MW-12 Sampling Zone No.: 1 Starting Time: 1235 Finishing Time: 1500

Technicians J. BRENNER, B. KELDPAUSCH

Water Level Inside MP Casing (Beginning of Session) 13.50 (PSIA) (End of Session) 32.14 (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	✓	✓	✓	✓	✓	✓	13.50	✓	1241	1245	✓	13.56	1.0	1ST RUN; INITIAL PARAMETERS; NTU's = 31.6
2	✓	✓	✓	✓	✓	✓	32.17	✓	1416	1419	✓	32.20	1.0	2ND RUN; NTUs = 7.53 AFTER PURGING 3.5 GALS
3	✓	✓	✓	✓	✓	—	32.09	—	1433	1437	✓	32.17	1.0	3RD RUN; COLLECT MW-12-051-055 ZVOAS, METALS, ANIONS
4	✓	✓	✓	✓	✓	✓	32.09	✓	1447	1451	✓	32.14	1.0	4TH RUN; Cr6+, ClO4; FINAL PARAMETERS
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 35.36 (PSIA)

Total Volume: 40 L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 243 Date: 3/1/99

Well Name: MW-12 Sampling Zone No.: 2 Starting Time: 1135 Finishing Time: 1230

Technicians J. BRENNER, B. FELDPAUSCH

Water Level Inside MP Casing (Beginning of Session) 58.29 (PSIA) (End of Session) 58.24 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	58.29	✓	1138	1140	✓	58.32	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 2.45
2	✓	✓	✓	✓	✓	✓	58.27	✓	1156	1159	✓	58.26	1.0	2ND RUN; COLLECT MW-991-054; MW-991-053; 4 VOAS, 2 METALS, ½ ANIONS
3	✓	✓	✓	✓	✓	✓	58.30	✓	1216	1219	✓	58.24	1.0	3RD RUN, ½ ANIONS, 2 CR-6T, 2 CLO4; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 75.35 (PSIA)

Total Volume: 3.0 L[F2]

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 323 Date: 3/1/99

Well Name: MW-12 Sampling Zone No.: 3 Starting Time: 1035 Finishing Time: 1125

Technicians J. BRENNER, B. FELDPAUSCH

Water Level Inside MP Casing (Beginning of Session) 93.20 (PSIA) (End of Session) 92.22 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	93.20	✓	1043	1045	✓	93.22	1.0	1ST RUN, ~~[illegible]~~ 1.3 INITIAL PARAMETERS; NTUS = 462
2	✓	✓	✓	✓	✓	✓	93.21	✓	1102	1104	✓	93.22	1.0	2ND RUN; COLLECT MW-091-052, 2 VOAS METALS, ANIONS Cr6+
3	✓	✓	✓	✓	✓	✓	92.20	✓	1120	1122	✓	92.22	0.5	3RD RUN; C104; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 109.47 (PSIA)

Total Volume: 7.5 L F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPC Location: MW-12 Depth: 436 Date: 3/1/99

Well Name: MW-12 Sampling Zone No.: 4 Starting Time: 0925 Finishing Time: 1025

Technicians J. BRENNER, B. FELDBAUSCH

Water Level Inside MP Casing (Beginning of Session) 142.43 ~~150.54~~ (PSIA) (End of Session) 141.42 (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	✓	✓	✓	✓	✓	✓	~~150.54~~ 142.46	✓	0938	0940	✓	142.43	1.0	1ST RUN; INITIAL PARAMETERS; NTUS = 3.05
2	✓	✓	✓	✓	✓	✓	142.47	✓	0950	1000	✓	142.45	1.0	2ND RUN; COLLECT MW-99I-051; 2 VOAS METALS ANIONS, C-611
3	✓	✓	✓	✓	✓	✓	141.44	✓	1021	1023	✓	141.42	0.5	3RD RUN; C104; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 158.54 (PSIA)

Total Volume: 2.5 L F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 545 Date: 3/1/99

Well Name: MW-12 Sampling Zone No.: 5 Starting Time: 0810 Finishing Time: 0920

Technicians: J. BRUNER, B. FELDTAUSCH

Water Level Inside MP Casing (Beginning of Session) 191.12 (PS.A) (End of Session) 191.09 (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	✓	✓	✓	✓	✓	✓	191.12	✓	0821	0823	✓	191.10	1.0	1ST RUN, INITIAL PARAMETERS, NTUS = 503
2	✓	✓	✓	✓	✓	✓	191.13	✓	0846	0848	✓	191.10	1.0	2ND RUN, COLLECT MW-091-050, 2 VOAS, METALS, ANIONS, C-64
3	✓	✓	✓	✓	✓	✓	191.15	✓	0912	0914	✓	191.09	1.0	3RD RUN, C10-4, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 204.59 (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-14 Depth: 207 Date: 3/4/99

Well Name: MW-14 Sampling Zone No.: 1 Starting Time: 1338 Finishing Time: 1436

Technicians D. DIRKIN, B. FEIDBAUSCH, M. COSI

Water Level Inside MP Casing (Beginning of Session) 32.01 PSIA (End of Session) 32.00 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	32.01	✓	1343 1350	1346	✓	32.06	1.0	1ST RUN TO SCREEN 1, INITIAL PARAMETERS, NTU = 4.83
2	✓	✓	✓	✓	✓	✓	32.01	✓	1401	1406	✓	32.01	1.0	2nd RUN, COLLECT SAMPLE MW-991-0347 VOAs, METALS
3	✓	✓	✓	✓	✓	✓	32.00	✓	1426	1431	✓	32.00	1.0	3rd RUN TO SCREEN 3, COLLECT SAMPLE ANIONS, CATS, COD, and final PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: H2O Pressure Outside WP = 33.16

Total Volume: 3.0 l

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPC Location: MW-14 Depth: 277 Date: 3/4/99

Well Name: MW-14 Sampling Zone No.: 2 Starting Time: 1231 Finishing Time: 1329

Technicians D. DIRKIN & B. FEINBAUGH

Water Level Inside MP Casing (Beginning of Session) 62.58 PSIA (End of Session) _____

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	62.58	✓	1238	1241	✓	62.61	1.0	1ST Run, Tube To Screen #2, Initial Parameters. NTU's 4.72
2	✓	✓	✓	✓	✓	✓	62.62	✓	1255	1258	✓	62.61	1.0	2nd Run, Collect Sample for 911-046, VOAs, Metals, Anions
3	✓	✓	✓	✓	✓	✓	62.12	✓	1317	1314	✓	62.08	0.75	Set Purge Screen #2, 046, Clay, and Final Parameters
4	✓	✓	DD	✓	✓									
5														
6														
7														
8														
9														
10														
11														
12														

Comments: High Press. Inside MP: 63.45

Total Volume: 2.75 l

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 382 Date: 3/4/99

Well Name: MW-14 Sampling Zone No.: 3 Starting Time: 1123 Finishing Time: ~~1124~~ 1224

Technicians D. DIRKIN & B. FEDBANSCH

Water Level Inside MP Casing (Beginning of Session) 108.47 PSIA (End of Session) 107.88 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	108.47	✓	1131	1133	✓	108.47	1.0	1ST RUN INITIAL PARAMETERS TO SCREEN 3 NTU: 0.65
2	✓	✓	✓	✓	✓	✓	108.48	✓	1153	1156	✓	108.52	1.0	2nd RUN, COLLECT SAMPLE MW-99I-045 VOAS, METALS, ANIONS.
3	✓	✓	✓	✓	✓	✓	107.82 ~~108.46~~	✓	1214	1216	✓	107.88	0.75	3rd RUN, FINAL PARAMETERS TO SCREEN 3
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: H_2O Pressure outside MP: 109.06 PSIA

Total Volume: 2.75

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 456 Date: 3/4/99

Well Name: MW-14 Sampling Zone No.: 4 Starting Time: 1012 Finishing Time: 1117

Technicians D. Durkin, B. FELDBAUSCH

Water Level Inside MP Casing (Beginning of Session) 140.66 (MSL) (End of Session) 139.52 MSL

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	✓	✓	✓	✓	✓	✓	140.66	✓	1020	1022	✓	140.61	1.0	1ST RUN, INITIAL PARAMETERS NTU's = 2.08
2	✓	✓	✓	✓	✓	✓	140.62	✓	1041	1043	✓	140.62	1.0	2nd RUN, COLLECT SAMPLE MW-99-044, 045 MS/MSD, BLANK, 1/2 GAL
3	✓	✓	✓	✓	✓	✓	139.59 140.52	✓	1109	1111	✓	139.52	.5	3rd RUN, CLOSE OUT and FINAL PARAMETERS TO SCREEN 4
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: H_2O Pressure Outside MP = 141.18

Total Volume: 2.5 L

F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 540 Date: 3/4/99

Well Name: MW-14 Sampling Zone No.: 5 Starting Time: 0815 Finishing Time: 1001

Technicians D. DIRKIN & B. FEDBANSCH

Water Level Inside MP Casing (Beginning of Session) 177.29 (PSIA) (End of Session) 177.17 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	177.24	✓	0854	0856	✓	177.23	1.0	1ST RUN TO SCREEN 5 - INITIAL PARAMETERS NTUs: 4.22
2	✓	✓	✓	✓	✓	✓	177.23	✓	0921	0923	✓	177.22	1.0	2ND RUN, COLLECT SAMPLE MW 491-043, VOCs, METALS, ANIONS, TOC
3	✓	✓	✓	✓	✓	✓	177.20	✓	0948	0950	✓	177.17	1.0	FINISH EVACUATING SAMPLE, CLAY AND FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: H_2O Press. Outside MP = 177.47. NOTE: Pressure outside MP ≈ to pressure inside. Total Volume: 3l

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 250' Date: 3-10-99

Well Name: MW-17 Sampling Zone No.: 1 Starting Time: 1325 Finishing Time: 1417

Technicians D. DIRKIN, B. FEIDBAUSCH & I. MAYES

Water Level Inside MP Casing (Beginning of Session) 14.03 PSIA (End of Session) 14.00 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.03	✓	1329	1335	✓	14.05	1.0	First Run To Screen 1, Initial Parameters, NTU = 1.54
2	✓	✓	✓	✓	✓	✓	13.98	✓	1350	1353	✓	13.99	1.0	Collect Sample, MW-99-016, VOC, metals Anion
3	✓	✓	✓	✓	✓	✓	14.00	✓	1407	1410	✓	14.00	0.5	3rd run To Screen 1, Calc, Clay and Final Parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: H_2O Pressure outside Wp: 37.20 PSIA

Total Volume: 2.5 l

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 250 Date: 3/18/99

Well Name: MW-17 Sampling Zone No.: 1* (RESAMPLE) Starting Time: 1055 Finishing Time: 1115

Technicians J. BRENNER, D. DIRKIN

Water Level Inside MP Casing (Beginning of Session) 13.96 (PSIA) (End of Session) 13.98 (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	✓	✓	✓	✓	✓	✓	13.96	✓	1101	1103	✓	13.98	0.5	1ST RUN; INITIAL PARAMETERS; NTUS = COLLECT
2														MW-991-040 (RE-SAMPLE FOR LAB); 2 VOAS ONLY
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 36.97 (PSIA)

Total Volume: 0.5

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 370 Date: 3-10-99

Well Name: MW-17 Sampling Zone No.: 2 Starting Time: 1207 Finishing Time: 1320

Technicians D. Dirkin, B. FeldBausch, I. Mayes

Water Level Inside MP Casing (Beginning of Session) 18.70 psia (End of Session) 17.54 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	✓	✓	✓	✓	✓	✓	18.78	✓	1217	1220	✓	18.67	1.0	1ST Run TO Screen 2, Initial Appear. NTU's 1.08
2	✓	✓	✓	✓	✓	✓	18.65	✓	1246	1249	✓	18.68	1.0	2nd run, collect Samples MW-99-039 VOCs, Metals & ANIONS
3	✓	✓	✓	✓	✓	✓	17.59	✓	1308	1310	✓	17.54	0.5 L @	3rd Run TO Screen 2, Turb, Clay and final parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: 12.0 Press. Outside WP = 83.36

Total Volume: 2.5 L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 460 Date: 3/18/99

Well Name: MW-17 Sampling Zone No.: 3 Starting Time: 0935 Finishing Time: 1050

Technicians J. BRENNER, D. DIRIGIN

Water Level Inside MP Casing (Beginning of Session) 79.80 (PSIA) (End of Session) 77.49 (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	✓	✓	✓	✓	✓	✓	79.80	✓	0848	0850	✓	79.82	1.0	1ST RUN; INITIAL PARAMETERS; NTUs = 6.28
2	✓	✓	✓	✓	✓	✓	79.81	✓	0911	0913	✓	79.80	1.0	2ND RUN; COLLECT MW-9911-038 2 VOAs 3/4 DIOXANE
3	✓	✓	✓	✓	✓	✓	79.84	✓	0940	0942	✓	79.81	1.0	3RD RUN; 1/4 DIOXANE; 1/2 NDMA
4	✓	✓	✓	✓	✓	✓	79.79	✓	1020	1022	✓	79.79	1.0	4TH RUN; 1/2 NDMA; METALS ANIONS
5	✓	✓	✓	✓	✓	✓	77.50	✓	1044	1045	✓	77.49	0.5	5TH RUN; C-61, C104; FINAL PARAMETERS
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 121.61 (PSIA)

Total Volume: 4.5 L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JRL Location: MW-17 Depth: ~~528~~ 582 Date: 3-10-99

Well Name: MW-17 Sampling Zone No.: 4 Starting Time: 1015 Finishing Time: 1200

Technicians D. DIRKIN, B. FEIDBAUCH & J. MAYES

Water Level Inside MP Casing (Beginning of Session) 110.98 psia (End of Session) 111.02 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	110.98	✓	1030	1036	✓	111.05	1.0	1ST RUN TO SCREEN 4. INITIAL PARAMETERS WITHIN 4.79
2	✓	✓	✓	✓	✓	✓	110.99	✓	1106	1109	✓	111.02	1.0	2nd RUN, COLLECT MW-491-037, VOCs, METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	110.95	✓	1134	1137	✓	111.02	1.0	3rd RUN, CATL, COLL 3 FINAL PARAM. TO SCREEN 4
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: 1120 Press. outside MP = 147.54

Total Volume: 3.0 l

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 726' Date: 3-10-99

Well Name: MW-17 Sampling Zone No.: 5 Starting Time: 0852 Finishing Time: 1610

Technicians: D. Dirkin, B. Feldbausch, T. Moyes

Water Level Inside MP Casing (Beginning of Session) 173.49 (TS.A) (End of Session) 173.49 (TS.A)

Run No.	Surface Function Checks: Activate	Surface Function Checks: Vacuum Check Valve Closed	Surface Function Checks: Valve Open	Surface Function Checks: Evacuate Container	Surface Function Checks: Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Surface Collection Checks: Activate	Surface Collection Checks: Valve Open Time	Surface Collection Checks: Valve Closed Time	Surface Collection Checks: Deactivate	Surface Collection Checks: Water Level in MP (ft) Remove Tape	Surface Collection Checks: Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	173.49	✓	906	909	✓	173.52	1.0	1ST RUN TO SCREEN 5, INITIAL PARAMETERS NTUs: 17.8 178
2	✓	✓	✓	✓	✓	✓	173.50	✓	946	943	✓	173.49	1.0	ATTEMPTING TO REDUCE TURBIDITY NTUs = 138
3														10:15 A.M. WILL PURGE THIS AFTERNOON DECIDED TO SAMPLE SCREEN 4
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: High pressure outside MP: 205.53 psia

Total Volume: 2.0 L

F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 726 Date: 3/15/99

Well Name: MW-17 Sampling Zone No.: 5 Starting Time: 1020 Finishing Time: 1430

Technicians J. BRENNER, I. MAYES

Water Level Inside MP Casing (Beginning of Session) 173.18 (FSIA) (End of Session) 190.80 (FSIA)*

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	173.18	✓	1039	1043	✓	173.15	1.0	1ST RUN, INITAL PARAMETERS, NTU'S = 12.4
2	✓	✓	✓	✓	✓	✓	173.15	✓	1114	1117	✓	173.18	1.0	ATTEMPTING TO REDUCE TURBIDITY NTUS = 99.3
3	✓	✓	✓	✓	✓	✓	191.86	✓	1310	1313	✓	191.87	1.0	3RD RUN, AFTER PURGING 4 GALS, NTU'S = 23.5
4	✓	✓	✓	✓	✓	✓	191.90	✓	1347	1351	✓	191.88	1.0	4TH RUN, COLLECT MW-391-036, 21 DAYS METALS, ANIONS, Cr^{6+}
5	✓	✓	✓	✓	✓	✓	190.89	✓	1418	1421	✓	190.80	0.5	5TH RUN, CLOSE, FINAL PARAMETERS
6														
7														
8														
9														
10														
11														
12														

Comments: APPROX. 4.0 GALS PURGED BETWEEN RUNS 2 & 3, IN 4W ATTEMPT TO REDUCE TURBIDITY

Total Volume: 4.5

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-18 Depth: 270 Date: 2/24/99

Well Name: MW-18 Sampling Zone No.: 1 Starting Time: 1445 Finishing Time: 1540

Technicians: J. BRENNER, B. FELDHAUSEN

Water Level Inside MP Casing (Beginning of Session) 13.37 (PSIA) (End of Session) 13.37

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	✓	✓	✓	✓	✓	✓	13.37	✓	1451	1455	✓	13.42	1.0	1ST RUN; INITIAL PARAMETERS; NTUs: 0.67
2	✓	✓	✓	✓	✓	✓	13.55	✓	1509	1513	✓	13.75	1.0	2ND RUN; COLLECT MW-99I-035; 2 VOAS METALS ANIONS;
3	✓	✓	✓	✓	✓	✓	13.52	✓	1530	1535	✓	13.60	1.0	3RD RUN; Cr6+, ClO4 FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CAS. (6) = 26.99 (PSIA)

Total Volume: 3.0

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-18 Depth: 330 Date: 2/24/99

Well Name: MW-18 Sampling Zone No.: 2 Starting Time: 1340 Finishing Time: 1435

Technicians: J. BRENNER, B. FELDPAUSCH

Water Level Inside MP Casing (Beginning of Session) 13.76 (PSIA) (End of Session) 13.52 (PSIA)

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	13.76	✓	1345	1349	✓	13.89	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 2.71
2	✓	✓	✓	✓	✓	✓	13.40	✓	1405	1409	✓	13.96	1.0	2ND RUN; COLLECT MW-9911-034 2 VOAS METALS, ANIONS, C.O.C.
3	✓	✓	✓	✓	✓	✓	13.46	✓	1430	1433	✓	13.52	1.0	3RD RUN; C104; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS OUTSIDE MP CASING = 53.52 (PSIA)

Total Volume: 3.0

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-18 Depth: 424 Date: 2/24/99

Well Name: MW-18 Sampling Zone No.: 3 Starting Time: 1245 Finishing Time: 1335

Technicians J. BRENNER, B. FELDPAUSCH

Water Level Inside MP Casing (Beginning of Session) 37.21 (PSIA) (End of Session) 36.23 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	37.21	✓	1254	1256	✓	37.20	1.0	1ST RUN; INITIAL PARAMETERS, NTUS =
2	✓	✓	✓	✓	✓	✓	37.20	✓	1315	1318	✓	37.31	1.0	2ND RUN; COLLECT MW-83-083 2 VOAS METALS AMOUNT GOT
3	✓	✓	✓	✓	✓	✓	36.23	✓	1323	1325	✓	36.23	0.5	3RD RUN; CLOSE FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 99.50 (PSIA)

Total Volume: 2.5

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW4B Depth: 564 Date: 2/24/99

Well Name: MW-18 Sampling Zone No.: 4 Starting Time: 1120 Finishing Time: 1240

Technicians: J. BRENNER, B. FELDPAUSCH

Water Level Inside MP Casing (Beginning of Session) 98.27 (PSIA) (End of Session) 98.19 (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	✓	✓	✓	✓	✓	✓	98.27	✓	1136	1138	✓	98.30	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 2.67
2	✓	✓	✓	✓	✓	✓	98.26	✓	1201	1203	✓	98.26	1.0	2ND RUN; COLLECT MW-991-032, MW-991-032MS/MSD; 6 VOAS, METALS
3	~~✓~~	~~✓~~	~~✓~~	~~✓~~	~~✓~~	~~✓~~	~~98.20~~	~~✓~~	~~1220~~	(1.13)				1/2 ANIONS; ~~CrVI, TIC~~
4	✓	✓	✓	✓	✓	✓	98.20	✓	1228	1230	✓	98.19	1.0	3RD RUN; 1/2 ANIONS; CrVI CHECK FINAL PARAMETERS
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP 98.26 = 154.22

Total Volume: 3.0 F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-18 Depth: 684 Date: 2/24/99

Well Name: MW-18 Sampling Zone No.: 5 Starting Time: 0935 Finishing Time: 1109

Technicians J. BRENNER, B. FELDTAUSCH

Water Level Inside MP Casing (Beginning of Session) 150.59 (PSIA) (End of Session) 149.43 (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	✓	✓	✓	✓	✓	✓	150.59	✓	0952	0954	✓	150.54	1.0	1ST RUN; INITIAL PARAMETERS; MTJ'S = 1.98
2	✓	✓	✓	✓	✓	✓	150.51	✓	1021	1023	✓	150.50	1.0	2ND RUN; COLLECT MW-991-031 2 VOAS, METALS, ANIONS, C-64
3	✓	✓	✓	✓	✓	✓	149.45	✓	1055	1057	✓	149.43	0.5	3RD RUN; C104; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 202.03 (PSIA)

Total Volume: 2.5 [F2]

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-19 Depth: 242 Date: 2/26/95

Well Name: MW-19 Sampling Zone No.: 1 Starting Time: 1340 Finishing Time: 1445

Technicians: J. BRENNAN, B. FELDPAUSCH

Water Level Inside MP Casing (Beginning of Session) 13.95 (FS, A) (End of Session) 13.97 (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	✓	✓	✓	✓	✓	✓	13.95	✓	1346	1349	✓	13.96	1.0	1ST RUN; INITIAL PARAMETERS; NTV'S =
2	✓	✓	✓	✓	✓	✓	13.97	✓	1418	1422	✓	13.99	1.0	2ND RUN COLLECT MW-991-030 2VOAS METALS ANIONS
3	✓	✓	✓	✓	✓	✓	13.95	✓	1435	1439	✓	13.97	0.5	3RD RUN; Cr^{+6}, ClO_4^- FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 51.21 (FS, A)

Total Volume: 2.5L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-19 Depth: 314 Date: 2/26/99

Well Name: MW-19 Sampling Zone No.: 2 Starting Time: 1220 Finishing Time: 1535

Technicians J. BRENNER, B. FELDPAUSCH

Water Level Inside MP Casing (Beginning of Session) 13.95 (PSIA) (End of Session) 13.98 (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	✓	✓	✓	✓	✓	✓	13.95	✓	1238	1241	✓	14.02	1.0	1ST RUN: INITIAL PARAMETERS; NTU'S = 3.94
2	✓	✓	✓	✓	✓	✓	13.78	✓	1257	1300	✓	13.96	1.0	2ND RUN: COLLECT MW-991-0291 2 VOA'S, METALS AND IONS
3	✓	✓	✓	✓	✓	✓	13.70	✓	1327	1330	✓	13.98	0.5	3RD RUN: Cr^{6+}, ClO_4, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 83.00 (PSIA)

Total Volume: 2.5 L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-19 Depth: 392 Date: 2/26/99

Well Name: MW-19 Sampling Zone No.: 3 Starting Time: 1105 Finishing Time: 1210

Technicians J. BRENNAN, B. FELDSPAUSCH

Water Level Inside MP Casing (Beginning of Session) 44.47 (PS.A) (End of Session) 44.41 (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	✓	✓	✓	✓	✓	✓	44.47	✓	1113	1115	✓	44.45	1.0	1ST RUN; INITIAL PARAMETERS, NTUS = 4.11
2	✓	✓	✓	✓	✓	✓	44.41	✓	1133	1136	✓	44.42	1.0	2ND RUN; COLLECT MW-94-028-028MS, 028MSD; 6VOAS, 2METALS
3	—	—	—	—	—	—	—	—	—	—	—	—	—	1/2 ANIONS
4	✓	✓	✓	✓	✓	✓	44.45	✓	1200	1202	✓	44.41	1.0	3RD RUN; 1/2 ANIONS, Cr6+, CL04 FINAL PARAMETERS
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 117.72 (PSIA)

Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-19 Depth: 444 Date: 2/26/99

Well Name: MW-19 Sampling Zone No.: 4 Starting Time: 0950 Finishing Time: 1100

Technicians J. BRENNER, B. FELDSPAUSCH

Water Level Inside MP Casing (Beginning of Session) 67.24 (PSIA) (End of Session) 67.21 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	67.24	✓	1004	1006	✓	67.25	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 4.38
2	✓	✓	✓	✓	✓	✓	67.23	✓	1027	1029	✓	67.24	1.0	2ND RUN; COLLECT MW-99-027 VOAS, METALS, ANIONS, C-63
3	✓	✓	✓	✓	✓	✓	67.20	✓	1048	1050	✓	67.21	1.0	3RD RUN; C104 FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 139.56 (PSIA)

Total Volume: 3.0 L [F-2]

Continue

Page 1 of 1

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-19 Depth: 498 Date: 2/26/99

Well Name: MW-19 Sampling Zone No.: 5 Starting Time: 0835 Finishing Time: 0945

Technicians J. BRENNER, B. FELDSPAUSCH

Water Level Inside MP Casing (Beginning of Session) 90.84 (PSIA) (End of Session) 89.72 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	90.84	✓	0842	0844	✓	90.80	1.0	1ST RUN; INITIAL PARAMETERS; NTU's = 4.37
2	✓	✓	✓	✓	✓	✓	90.77	✓	0910	0912	✓	90.75	1.0	2ND RUN; COLLECTION-991-026; 2 VOAS METALS, ANIONS, C&A
3	✓	✓	✓	✓	✓	✓	89.73	✓	0935	0937	✓	89.72	0.5	3RD RUN; C104; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: PRESS. OUTSIDE MP CASING = 162.92 (PSIA)

Total Volume: 2.5L

F-2