FOSTER WHEELER ENVIRONMENTAL CORPORATION

REPORT

QUARTERLY GROUNDWATER MONITORING RESULTS, APRIL-MAY 1998

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
JET PROPULSION LABORATORY
Pasadena, California

August 1998

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at the:

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)
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

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EXECUTIVE SUMMARY

Presented in this report are the results of the seventh long-term quarterly groundwater monitoring event (April-May 1998) of the Comprehensive Environmental Response, Compensation and Liability Act Remedial Investigation/Feasibility Study at the NASA-Jet Propulsion Laboratory (JPL). This event is part of the long-term quarterly groundwater monitoring program that was initiated in response to requests from the United States Environmental Protection Agency.

From April 20 to May 15, 1998, groundwater samples were collected from JPL monitoring wells (both on- and off-site) and analyzed for volatile organic compounds (VOCs), metals (arsenic, lead, total chromium, and hexavalent chromium), perchlorate, and major anions/cations. Analyses for 1,4-dioxane and n-nitroso-dimethylamine (NDMA) were also performed on six (6) samples from selected wells/screens as a screening for their presence in the groundwater beneath JPL.

Results indicated that only four VOCs (carbon tetrachloride, trichloroethene, tetrachloroethene and 1,2-dichloroethane) were detected in concentrations above state or Federal Maximum Contaminant Levels (MCLs) for drinking water. Perchlorate was detected in 5 wells above its interim action level of 18 µg/l. Hexavalent chromium was found in two wells. To date, an MCL has not been established for hexavalent chromium. Arsenic and lead were not detected at concentrations above their MCLs and total chromium was detected in only one well above its MCL. A summary of the sampling procedure is included in Section 2.0 and a summary of the analytical results is included in Section 3.0.

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

1.0 INTRODUCTION

This report summarizes the results from the seventh sampling event of the long-term quarterly groundwater monitoring program currently being conducted at the NASA-Jet Propulsion Laboratory (JPL). The purpose of the program is to monitor the elevation, flow direction, and quality of the groundwater beneath and adjacent to the JPL site. From April 20 to May 15, 1998, Foster Wheeler Environmental Corporation (Foster Wheeler) personnel sampled the JPL monitoring wells (both on- and off-site). In addition, water level measurements at each well were taken prior to (April 17, 1998), and after sampling (May 18, 1998) 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 (MP) wells, each containing five screened intervals within a Westbay Instruments, Inc. (Westbay) multi-port casing system. Monitoring wells MW-1, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-13, MW-15, and MW-16 are relatively shallow standpipe wells, each containing a single screened interval located just below the water table. Monitoring well MW-2 has been replaced with well MW-14 (Figure 1-1) as a JPL sampling point. A summary of the well construction details for the JPL groundwater monitoring wells is included in Table 1-1.

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

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

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

Temperature, pH, electrical conductivity and turbidity of the water removed from each well were monitored during purging. After these parameters had stabilized (when two successive measurements made approximately 3 minutes apart were within 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 after sample collection. 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 JPL multi-port (MP) monitoring wells required specialized sampling equipment manufactured by Westbay. This equipment included a pressure profiling/sampling probe with a surface control unit. Field personnel using this equipment were trained by Westbay personnel to ensure proper use. Copies of the detailed operations manuals for the Westbay pressure profiling/sampling probe are included in the OU-1 and OU-3 Field Sampling and Analysis Plans (Ebasco, 1993a; 1994).

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

- Wash each 250-ml stainless steel sample bottle in a solution of non-phosphate detergent (Liquinox®) and distilled water followed by washing each bottle in a solution of an acidic detergent (Citranox®) and 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 MP monitoring wells because the groundwater sample is collected directly from the aquifer which 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 sampling container with formation water. Samples for laboratory analysis were then collected and transferred to bottles as described above (final paragraph in Section 2.1). A final sample was collected and 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 and maintenance of field instruments were carried out according to procedures described previously (Ebasco, 1993a; 1994).

2.3 FIELD QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

To verify the quality of the groundwater samples collected from the JPL monitoring wells, field QA/QC samples were collected. The field QA/QC program included the collection of duplicate samples, equipment blanks, 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 ClO_4^- analyses were collected from shallow groundwater monitoring wells MW-10 and MW-13, and deep MP 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 the laboratory's 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 their use. One MS/MSD sample was also submitted for 1,4-dioxane and NDMA.

One equipment blank was collected from the Westbay sample bottles during each day of sampling of the deep MP wells. Equipment blanks consisted of ASTM Type II organic free water (provided by the laboratory) which had been passed through the sampling equipment after the equipment had been decontaminated. Equipment blanks were analyzed for the same constituents (except cations and anions) as the groundwater samples to identify potential cross contamination due to inadequate decontamination procedures. Equipment blanks were not collected during sampling of the shallow wells as dedicated sampling equipment was used.

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

During this sampling event, one field blank was collected at 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 field-blank bottles 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 April 20 to May 15, 1998. Monitoring well MW-2 was not sampled as it was replaced as a JPL monitoring point by deep multi-port well MW-14.

The groundwater samples collected during this sampling event were analyzed for VOCs, total Cr, Cr(VI), total Pb, total As, and ClO_4^-. Samples collected from selected wells/screens were also analyzed for 1,4-dioxane and NDMA. All samples were also analyzed for general water chemistry parameters that included major cations and anions [sodium (Na), potassium (K), calcium (Ca), magnesium (Mg), iron (Fe), alkalinity (CO_3 + HCO_3), chloride (Cl), sulfate (SO_4), nitrate (NO_3)], total dissolved solids (TDS), specific conductivity and pH. A summary of the samples collected, sample numbers used, and the analyses performed on each sample are 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 April-May 1998 sampling event were analyzed for over 60 different VOCs in accordance with EPA Method 524.2. To present the results from the multiport wells on concentration contour maps, the JPL aquifer was divided into four aquifer layers based on correlations interpreted from lithologic cross sections. Listed in Table 3-2 are the JPL monitoring well screens and their corresponding aquifer layers. Results of the analyses for VOCs in the April-May 1998 samples are summarized in Table 3-3 along with the Maximum Contaminant Levels (MCLs) for drinking water as listed in Title 22 of the California Code of Regulations and in the EPA Health Advisory Guidelines. A small number of compounds were detected in these 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 maps to show the spatial distribution of each constituent. Where a constituent was not detected in a particular aquifer layer, a contour map was not prepared for that layer. Carbon tetrachloride detected in aquifer layers 1, 2 and 3 are contoured in Figures 3-1, 3-2 and 3-3, respectively. Figures 3-4, 3-5 and 3-6 include contours of TCE concentrations detected in layers 1, 2 and 3, respectively, and Figure 3-7 contains contours of 1,2-DCA concentrations detected in aquifer layer 1. Figures 3-8, 3-9 and 3-10 include contours of PCE detected in aquifer layers 1, 2 and 3. A summary of VOC results collected during all seven of the long-term quarterly sampling events completed to date is provided in Table 3-4.

CCl_4 in excess of the state MCL (0.5 µg/l) was found in ten of the on-site wells, and one of the off-site wells (Table 3-3, Figures 3-1, 3-2 and 3-3). The Federal MCL (5.0 µg/l) was exceeded in five on-site wells. The highest concentrations of CCl_4 were found in on-site wells MW-7, MW-12 (screen 3), MW-16 and MW-24 (screen 2).

TCE concentrations exceeded the state and Federal MCL (5.0 µg/l) in five on-site wells, and two off-site wells (Table 3-3, Figures 3-4, 3-5, and 3-6). The highest levels of TCE were found in on-site wells MW-13 and MW-23 (screen 1), and off-site well MW-21 (screen 1).

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

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 in only one well [off-site upgradient well MW-21 (screen 5)].

3.2 PERCHLORATE RESULTS

Perchlorate analyses were conducted on groundwater samples from the April-May 1998 event by ion chromatography (EPA 300.0, modified). Results are included in Table 3-3. No MCLs for ClO_4^- have been established to date, however, the California Department of Health Services has established an Interim Action Level of 18 µg/l for ClO_4^-. Perchlorate was detected in a total of 15 wells (Table 3-3), of which 5 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 (screens 1 and 2).

3.3 METALS RESULTS

Groundwater samples from the April-May 1998 sampling event were analyzed for the following suite of metals: total As, total Pb, total Cr, and Cr(VI). The results of these analyses are summarized in Table 3-5.

Total As was not detected in any wells during the April-May 1998 event. Total Pb was detected in wells MW-3 (screen 5), MW-10, and MW-17 (screen 5). Concentrations of Pb ranged from 0.002 to 0.008 mg/L, which are well below the state MCL (0.050 mg/L), and the federal action level (0.15 mg/L). Total Cr was detected in seven wells [MW-6, MW-8, MW-10, MW-12 (screen 1), MW-14 (screen 1), MW-16, and MW-18 (screen 3)] at concentrations below state and Federal drinking water standards (0.05 and 0.10 mg/l, respectively). However, total Cr was also detected above the state MCL but below the Federal action level in MW-13 (0.08 mg/l).

Hexavalent chromium was detected in on-site shallow well MW-13 and off-site deep well MW-18 (screen 3). At this time, state or federal agencies have not established an MCL for Cr(VI).

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

3.4 1,4-DIOXANE AND NDMA RESULTS

Groundwater samples 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 April-May 1998 sampling event were analyzed for 1,4-dioxane and NDMA as a screening for their presence in the groundwater beneath JPL. The wells sampled have historically contained the highest concentrations of VOCs in the groundwater. 1,4-Dioxane was analyzed using EPA Method 8270 and NDMA was analyzed using EPA Method 1625C. At this time, no state or Federal MCLs have been established for these two compounds. The method detection limits for 1,4-dioxane and NDMA are 3 µg/l and 0.005 µg/l, respectively. 1,4-Dioxane was detected in only one well (MW-16) at a concentration of 5 µg/l. NDMA was not detected in any of the samples for which it was analyzed. The same wells will be sampled one more time next quarter for 1,4-dioxane and NDMA to confirm that these compounds are not a concern at the site.

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 April-May 1998 samples are acceptable for their intended use of characterizing aquifer quality. Surrogate compound, matrix and blank spike, and method blank results were used by the laboratory to determine the accuracy and precision of the analytical techniques with respect to the JPL groundwater matrix, and to identify anomalous results due to laboratory contamination or instrument malfunction.

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

Duplicate samples were used as an independent means of evaluating the precision of the laboratory analyses. Duplicate groundwater samples for VOCs, ClO_4^- and metals analyses were collected from MW-4 (screen 2), MW-10, MW-12 (screen 2), and MW-13. All of the analytical results for the duplicate samples were similar to the results of the original groundwater samples (Table 3-3 and Table 3-5).

Seventeen equipment blanks and twenty trip blanks were submitted for analysis during the April-May 1998 sampling event. No VOCs were detected in any of the equipment or trip blanks,

indicating that contamination of JPL groundwater samples due to improper decontamination or during travel is very unlikely.

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

4.0 GENERAL WATER CHEMISTRY

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

4.1 ANALYTICAL RESULTS

To illustrate the relative proportions of the major cations and anions in each groundwater sample, the water chemistry results from the April-May 1998 event have been compiled as Stiff diagrams (Figures 4-1, 4-2 and 4-3). Review of the water chemistry data from this investigation indicates that the majority of groundwater sampled at JPL can be classified as one of three general types, based on the predominant cation and anion, and the occurrence of other ions. These general water types include:

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

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

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

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

Water Type 1, the calcium-bicarbonate water type, was the most common water type at JPL during the April-May 1998 sampling event. In general, it was found at relatively shallow depths in those wells 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 groundwaters, the calcium-bicarbonate/chloride/ sulfate/nitrate water type, were prevalent in the more shallow screens of those monitoring wells located around the margins of the JPL facilities, including "downgradient" and "upgradient"

wells. A list of water types and their locations in the JPL monitoring wells 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 April-May 1998 samples were performed. These checks included calculation of total ion-charge balances, and comparison of measured TDS to calculated TDS. The results of these checks for the April-May 1998 water-chemistry results are presented in Table 4-3. Charge balances are expressed as the percent difference between the sum of the equivalent weights of all of the anions and all of the cations analyzed (Freeze and Cherry, 1979). The ideal range for charge balances is $\pm$5 percent, although charge balance errors up to $\pm$10 percent are considered acceptable.

The charge balances for samples analyzed for major anions and cations during the April-May 1998 sampling event are within the ideal range ($\pm$5 percent) for 49 of the 75 sets of water chemistry results. The charge balance for the remaining sets of water chemistry analyses were slightly above 5 percent (Table 4-3), and only one exceeded the range of $\pm$10%. This indicates that the results are acceptable for their intended use.

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

The ratio of measured to calculated TDS values for the April-May 1998 water-chemistry results fell within the ideal range (1.0 to 1.2) for 66 of the 75 sets of water chemistry analyses performed (Table 4-3). The ratio for the remaining nine sets of water chemistry data fell slightly outside this ideal range suggesting sample inhomogeneity errors in the measured TDS values. However, these data are suitable for their intended use of identifying differences in water chemistry across the site.

5.0 WATER-LEVEL MEASUREMENTS

Water-level measurements were recorded before sampling, on April 17, 1998, and after sampling on May 18, 1998 to evaluate groundwater flow directions and gradients. Water-level data in the shallow wells were collected using a Solinst® water-level meter that utilized a water-sensor probe attached to a measuring tape. As the probe was lowered into a well, contact with the groundwater completed a circuit between two electrodes in the probe, thus activating a sounding device attached to a reel at the surface. Depth to groundwater was then read directly from the measuring tape at the top of the well casing.

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

Water-table elevation measurements taken before sampling are provided in Table 5-1 and have been contoured in Figure 5-1. Water-table elevation measurements taken after sampling are provided in Table 5-2 and have been contoured in Figure 5-2. The hydraulic heads measured at each deep multi-port well screen before and after sampling are presented graphically in Figures 5-3 and 5-4, respectively. The pressure profile records for the deep wells are included in Appendix B.

As indicated by Figures 5-1 and 5-2, groundwater flow was primarily to the south and east both before and after sampling. It is apparent that mounding has occurred along the eastern edge of the facility due to heavy winter rains and subsequent aquifer recharge. This mounding has led to a temporary change of flow locally in the westerly direction. The "trough" of depression observed around the City of Pasadena municipal production wells (Figure 5-1 and 5-2) is the result of active pumping by several of these wells throughout this sampling event. This is also indicated by data shown in Figures 5-3 and 5-4. The effects of the pumps 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 and -19).

6.0 REFERENCES

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TABLES

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

Well Number	Well Type	Year Installed	Drilling Method	Depth to Bottom of Casing (feet)	Depth of Screened Interval (feet)	Elevation Top 4 inch Casing (feet above mean sea level)	Elevation of Screened Interval (feet above mean sea level)	Multi-Port Well Screen Number	Sand Pack (feet)	Screen Slot Size (inch)	Casing Material
MW-1	Shallow Standpipe	1989	Mud Rotary	120	70-110	1116.7	1006.70-1046.70	-	99		4" PVC
MW-2	Shallow Standpipe	1989	Mud Rotary	177	127-167	1168.85	1001.85-1041.85	-			
MW-3	Deep Multi-Port	1990	Mud Rotary	700	170-180	1099.82	919.82-929.82	1	37	0.010	4" low-carbon steel
					250-260		839.82-849.82	2	47	0.010	4" low-carbon steel
					344-354		745.82-755.82	3	45	0.010	4" low-carbon steel
					555-565		534.82-544.82	4	39	0.010	4" low-carbon steel
					650-660		433.82-443.82	5	64	0.010	4" low-carbon steel
MW-4	Deep Multi-Port	1990	Mud Rotary	559	147-157	1082.72	925.72-935.72	1	48	0.010	4" low-carbon steel
					237-247		835.72-845.72	2	34	0.010	4" low-carbon steel
					318-328		754.72-764.72	3	42	0.010	4" low-carbon steel
					389-399		683.72-693.72	4	54	0.010	4" low-carbon steel
					509-519		563.72-573.72	5	52	0.010	4" low-carbon steel
MW-5	Shallow Standpipe	1990	Air Percussion	140	85-135	1071.6	936.60-986.60	-	71	0.010	4" low-carbon steel
MW-6	Shallow Standpipe	1990	Air Percussion	245	195-245	1188.52	943.52-993.52	-	62	0.010	4" low-carbon steel
MW-7	Shallow Standpipe	1990	Air Percussion	275	225-275	1212.88	937.88-987.88	-	63	0.010	4" low-carbon steel
MW-8	Shallow Standpipe	1992	Air Percussion	205	155-205	1139.53	934.53-984.53	-	75	0.010	4" low-carbon steel
MW-9	Shallow Standpipe	1992	Air Percussion	68	18-68	1106.02	1038.02-1088.02	-	56	0.010	4" PVC
MW-10	Shallow Standpipe	1992	Air Percussion	155	105-155	1087.71	932.71-982.71	-	67.5	0.010	4" PVC (0-85') 4" stainless steel (85'-105')
MW-11	Deep Multi-Pornt	1992	Mud Rotary	680	140-150	1139.35	989.35-999.35	1	24	0.010	4" low-carbon steel
					250-260		879.35-889.35	2	22	0.010	4" low-carbon steel
					420-430		709.35-719.35	3	26	0.010	4" low-carbon steel
					515-525		614.35-624.35	4	26	0.010	4" low-carbon steel
					630-640		499.35-509.35	5	28	0.010	4" low-carbon steel
MW-12	Deep Multi-Port	1994	Mud Rotary	596	135-145	1102.14	957.14-967.14	1	22	0.010	4" low-carbon steel
					240-250		852.14-862.14	2	19	0.010	4" low-carbon steel
					315-325		777.14-787.14	3	21	0.010	4" low-carbon steel
					430-440		662.14-672.14	4	22	0.010	4" low-carbon steel
					546-556		546.14-556.14	5	21	0.010	4" low-carbon steel

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

Well Number	Well Type	Year Installed	Drilling Method	Depth to Bottom of Casing (feet)	Depth of Screened Interval (feet)	Elevation Top 4 inch Casing (feet above mean sea level)	Elevation of Screened Interval (feet above mean sea level)	Multi-Port Well Screen Number	Sand Pack (feet)	Screen Slot Size (inch)	Casing Material
MW-13	Shallow Standpipe	1994	Air Rotary	235	180-230	1183.47	953.47-1003.47	-	65	0.010	4" PVC
MW-14	Deep Multi-Port	1994	Mud Rotary	588	205-215	1173.42	958.42-968.42	1	22	0.010	4" low-carbon steel
					275-285		888.42-898.42	2	26	0.010	4" low-carbon steel
					380-390		783.42-793.42	3	22	0.010	4" low-carbon steel
					453-463		710.42-720.42	4	27	0.010	4" low-carbon steel
					538-548		625.42-635.42	5	21	0.010	4" low-carbon steel
MW-15	Shallow Standpipe	1994	Air Percussion	74	19-69	1120.66	1051.66-1101.66	-	60	0.010	4" stainless steel
MW-16	Shallow Standpipe	1994	Air Percussion	285	230-280	1236.27	956.27-1006.27	-	62	0.010	4.5" PVC
MW-17	Deep Multi-Port	1995	Mud Rotary	774	246-256	1190.99	934.99-944.99	1	24	0.010	4" low-carbon steel
					366-376		814.99-824.99	2	24	0.010	4" low-carbon steel
					466-476		714.99-724.99	3	27	0.010	4" low-carbon steel
					578-588		602.99-612.99	4	25	0.010	4" low-carbon steel
					723-733		457.99-467.99	5	22	0.010	4" low-carbon steel
MW-18	Deep Multi-Port	1995	Mud Rotary	732	266-276	1225.34	949.34-959.34	1	22	0.010	4" low-carbon steel
					326-336		889.34-899.34	2	24	0.010	4" low-carbon steel
					421-431		794.34-804.34	3	20	0.010	4" low-carbon steel
					561-571		654.34-664.34	4	22	0.010	4" low-carbon steel
					681-691		534.34-544.34	5	23	0.010	4" low-carbon steel
MW-19	Deep Multi-Port	1995	Mud Rotary	543	240-250	1143.2	893.20-903.20	1	20	0.010	4" low-carbon steel
					310-320		823.20-833.20	2	20	0.010	4" low-carbon steel
					390-400		743.20-753.20	3	17	0.010	4" low-carbon steel
					442-452		691.20-701.20	4	20	0.010	4" low-carbon steel
					492-502		641.20-651.20	5	22	0.010	4" low-carbon steel
MW-20	Deep Multi-Port	1995	Mud Rotary	948	228-238	1164.89	926.89-936.89	1	24	0.010	4" low-carbon steel
					388-398		766.89-776.89	2	23	0.010	4" low-carbon steel
					558-568		596.89-606.89	3	19	0.010	4" low-carbon steel
					698-708		456.89-466.89	4	23	0.010	4" low-carbon steel
					898-908		256.89-266.89	5	27	0.010	4" low-carbon steel

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

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

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, APRIL-MAY 1998

Sample Location	Sample Number	Sampling Date	Sample Type	VOCs EPA 524.2	Total Cr, As, Pb, Major Cations (various)	Hexavalent Cr EPA 7196	Major Anions and TDS EPA 300.0/310.1	Perchlorate EPA 300.0 Modified	1,4-Dioxane EPA 8270	NDMA EPA 1625C
MW-1	MW-982-001	5/15/98	GW	X	X	X	X	X		
MW-3										
Screen 1	MW-982-002	4/29/98	GW	X	X	X	X	X		
Screen 2	MW-982-003	4/29/98	GW	X	X	X	X	X		
Screen 3	MW-982-004	4/29/98	GW	X	X	X	X	X		
Screen 4	MW-982-005	4/29/98	GW	X	X	X	X	X		
Screen 5	MW-982-006	4/29/98	GW	X	X	X	X	X		
MW-4										
Screen-1	MW-982-007	5/4/98	GW	X	X	X	X	X		
Screen 2	MW-982-008	5/12/98	GW	X	X	X	X	X	X	X
Screen 2	MW-982-009	5/12/98	DUP	X	X (no cations)	X		X		
Screen 3	MW-982-010	5/4/98	GW	X	X	X	X	X		
Screen 4	MW-982-011	5/4/98	GW	X	X	X	X	X		
Screen 5	MW-982-012	5/4/98	GW	X	X	X	X	X		
MW-5	MW-982-013	5/15/98	GW	X	X	X	X	X		
MW-6	MW-982-014	5/14/98	GW	X	X	X	X	X		
MW-7	MW-982-015	5/13/98	GW	X	X	X	X	X	X	X
MW-8	MW-982-016	5/14/98	GW	X	X	X	X	X		
MW-9	MW-982-017	5/15/98	GW	X	X	X	X	X		
MW-10	MW-982-018	5/14/98	GW	X	X	X	X	X		
MW-10	MW-982-019	5/14/98	DUP	X	X (no cations)	X		X		
MW-11										
Screen 1	MW-982-020	4/30/98	GW	X	X	X	X	X		
Screen 2	MW-982-021	4/30/98	GW	X	X	X	X	X		
Screen 3	MW-982-022	4/30/98	GW	X	X	X	X	X		
Screen 4	MW-982-023	4/30/98	GW	X	X	X	X	X		
Screen 5	MW-982-024	4/30/98	GW	X	X	X	X	X		

GW: Groundwater Sample
DUP: Duplicate Sample

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, APRIL-MAY 1998

Sample Location	Sample Number	Sampling Date	Sample Type	VOCs EPA 524.2	Total Cr, As, Pb, Major Cations (various)	Hexavalent Cr EPA 7196	Major Anions and TDS EPA 300.0/310.1	Perchlorate EPA 300.0 Modified	1,4-Dioxane EPA 8270	NDMA EPA 1625C
MW-12										
Screen 1	MW-982-025	5/4/98	GW	X	X	X	X	X		
Screen 2	MW-982-026	5/1/98	GW	X	X	X	X	X		
Screen 2	MW-982-027	5/1/98	DUP	X	X (no cations)	X		X		
Screen 3	MW-982-028	5/1/98	GW	X	X	X	X	X		
Screen 4	MW-982-029	5/1/98	GW	X	X	X	X	X		
Screen 5	MW-982-030	5/1/98	GW	X	X	X	X	X		
MW-13	MW-982-031	5/13/98	GW	X	X	X	X	X	X	X
MW-13	MW-982-032	5/13/98	DUP	X	X (no cations)	X		X		
MW-14										
Screen 1	MW-982-033	4/28/98	GW	X	X	X	X	X		
Screen 2	MW-982-034	4/28/98	GW	X	X	X	X	X		
Screen 3	MW-982-035	4/28/98	GW	X	X	X	X	X		
Screen 4	MW-982-036	4/28/98	GW	X	X	X	X	X		
Screen 5	MW-982-037	4/28/98	GW	X	X	X	X	X		
MW-15	MW-982-038	5/15/98	GW	X	X	X	X	X		
MW-16	MW-982-039	5/14/98	GW	X	X	X	X	X	X	X
MW-17										
Screen 1	MW-982-040	4/22/98	GW	X	X	X	X	X		
Screen 2	MW-982-041	4/22/98	GW	X	X	X	X	X		
Screen 3	MW-982-042	5/11/98	GW	X	X	X	X	X	X	X
Screen 4	MW-982-043	4/22/98	GW	X	X	X	X	X		
Screen 5	MW-982-044	4/22/98	GW	X	X	X	X	X		
MW-18										
Screen 1	MW-982-045	4/21/98	GW	X	X	X	X	X		
Screen 2	MW-982-046	4/21/98	GW	X	X	X	X	X		
Screen 3	MW-982-047	4/21/98	GW	X	X	X	X	X		
Screen 4	MW-982-048	4/21/98	GW	X	X	X	X	X		
Screen 5	MW-982-049	4/20/98	GW	X	X	X	X	X		

GW: Groundwater Sample
DUP: Duplicate Sample

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, APRIL-MAY 1998

Sample Location	Sample Number	Sampling Date	Sample Type	VOCs EPA 524.2	Total Cr, As, Pb, Major Cations (various)	Hexavalent Cr EPA 7196	Major Anions and TDS EPA 300.0/310.1	Perchlorate EPA 300.0 Modified	1,4-Dioxane EPA 8270	NDMA EPA 1625C
MW-19										
Screen 1	MW-982-050	4/24/98	GW	X	X	X	X	X		
Screen 2	MW-982-051	4/24/98	GW	X	X	X	X	X		
Screen 3	MW-982-052	4/24/98	GW	X	X	X	X	X		
Screen 4	MW-982-053	4/24/98	GW	X	X	X	X	X		
Screen 5	MW-982-054	4/24/98	GW	X	X	X	X	X		
MW-20										
Screen 1	MW-982-055	4/23/98	GW	X	X	X	X	X		
Screen 2	MW-982-056	4/23/98	GW	X	X	X	X	X		
Screen 3	MW-982-057	4/23/98	GW	X	X	X	X	X		
Screen 4	MW-982-058	4/23/98	GW	X	X	X	X	X		
Screen 5	MW-982-059	4/23/98	GW	X	X	X	X	X		
MW-21										
Screen 1	MW-982-060	4/27/98	GW	X	X	X	X	X		
Screen 2	MW-982-061	4/27/98	GW	X	X	X	X	X		
Screen 3	MW-982-062	4/27/98	GW	X	X	X	X	X		
Screen 4	MW-982-063	4/27/98	GW	X	X	X	X	X		
Screen 5	MW-982-064	4/27/98	GW	X	X	X	X	X		
MW-22										
Screen 1	MW-982-065	5/7/98	GW	X	X	X	X	X		
Screen 2	MW-982-066	5/7/98	GW	X	X	X	X	X		
Screen 3	MW-982-067	5/6/98	GW	X	X	X	X	X		
Screen 4	MW-982-068	5/6/98	GW	X	X	X	X	X		
Screen 5	MW-982-069	5/6/98	GW	X	X	X	X	X		
MW-23										
Screen 1	MW-982-070	5/8/98	GW	X	X	X	X	X		
Screen 2	MW-982-071	5/8/98	GW	X	X	X	X	X		
Screen 3	MW-982-072	5/8/98	GW	X	X	X	X	X		
Screen 4	MW-982-073	5/8/98	GW	X	X	X	X	X		
Screen 5	MW-982-074	5/8/98	GW	X	X	X	X	X		

GW: Groundwater Sample
DUP: Duplicate Sample

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, APRIL-MAY 1998

Sample Location	Sample Number	Sampling Date	Sample Type	VOCs EPA 524.2	Total Cr, As, Pb, Major Cations (various)	Hexavalent Cr EPA 7196	Major Anions and TDS EPA 300.0/310.1	Perchlorate EPA 300.0 Modified	1,4-Dioxane EPA 8270	NDMA EPA 1625C
MW-24										
Screen 1	MW-982-075	5/11/98	GW	X	X	X	X	X	X	X
Screen 2	MW-982-076	5/5/98	GW	X	X	X	X	X		
Screen 3	MW-982-077	5/6/98	GW	X	X	X	X	X		
Screen 4	MW-982-078	5/5/98	GW	X	X	X	X	X		
Screen 5	MW-982-079	5/5/98	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, APRIL-MAY 1998

(concentrations in µg/l)

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

Sampling Location	Sample Number	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Chloroform	Other Volatile Organic Compounds	Perchlorate
MW-1	MW-982-001	--	--	--	--	--	--	--	--	--	--
MW-3											
Screen 1	MW-982-002	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-982-003	--	--	--	--	--	--	--	--	--	--
Screen 3	MW-982-004	**3.6**	0.9	--	--	--	--	--	3.9	--	6.2
Screen 4	MW-982-005	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-982-006	--	--	--	--	--	--	--	--	--	--
MW-4											
Screen 1	MW-982-007	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-982-008	**2.8**	4.3	0.7	0.5	--	--	--	3.1	--	**40**
Screen 2 (DUP)	MW-982-009	**2.4**	3.5	--	--	--	--	--	2.5	--	**41**
Screen 3	MW-982-010	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-982-011	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-982-012	--	--	--	--	--	--	--	--	--	--
MW-5	MW-982-013	--	--	--	--	--	--	--	--	--	--
MW-6	MW-982-014	--	0.7	3.2	1.1	--	--	--	0.6	--	--
MW-7	MW-982-015	**31**	**13**	0.5	--	--	--	3.1	6.1	--	**130**
MW-8	MW-982-016	**1.3**	1.3	--	--	--	--	--	0.5	--	7.6
MW-9	MW-982-017	--	--	--	--	--	--	--	--	--	--
MW-10	MW-982-018	--	--	--	--	--	--	--	--	--	--
MW-10 (DUP)	MW-982-019	--	--	--	--	--	--	--	--	--	--

--: 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: Initial value reported at 21 µg/l. After re-evaluation, laboratory determined result likely from interference (See laboratory report in Appendix D)

TABLE 3-3

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

(concentrations in µg/l)

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

Sampling Location	Sample Number	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Chloroform	Other Volatile Organic Compounds	Perchlorate
MW-11											
Screen 1	MW-982-020	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-982-021	**1.0**	--	--	--	--	--	--	0.7	--	--
Screen 3	MW-982-022	**1.0**	--	--	--	--	--	--	1.3	--	--
Screen 4	MW-982-023	--	--	--	--	--	--	--	0.5	--	--
Screen 5	MW-982-024	--	--	--	--	--	--	--	--	--	--
MW-12											
Screen 1	MW-982-025	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-982-026	**1.1**	--	--	--	--	--	--	0.9	--	6.0
Screen 2 (*DUP*)	MW-982-027	**1.2**	--	--	--	--	--	--	0.9	--	5.7
Screen 3	MW-982-028	**25**	--	--	--	--	--	--	2.0	--	6.9
Screen 4	MW-982-029	**4.3**	--	--	--	--	--	--	1.2	--	8.0
Screen 5	MW-982-030	**1.7**	--	--	--	--	--	--	0.6	--	--
MW-13	MW-982-031	**13**	**17**	0.5	--	--	0.8	0.6	5.2	--	**95**
MW-13 (DUP)	MW-982-032	**12**	**17**	0.6	--	--	0.9	0.6	5.7	--	**100**
MW-14											
Screen 1	MW-982-033	--	--	1.2	0.8	--	--	--	0.8	--	4.4
Screen 2	MW-982-034	--	--	1.2	0.7	--	--	--	0.6	--	4.0
Screen 3	MW-982-035	--	--	--	--	--	--	--	--	--	5.8
Screen 4	MW-982-036	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-982-037	--	--	--	--	--	--	--	--	--	--
MW-15	MW-982-038	--	--	--	--	--	--	--	--	--	--
MW-16	MW-982-039	**42**	**12**	0.8	--	**1.4**	1.6	1.2	20	--	**640**

--: 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: Initial value reported at 21 µg/l. After re-evaluation, laboratory determined result likely from interference (See laboratory report in Appendix D)

TABLE 3-3

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

(concentrations in µg/l)

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

Sampling Location	Sample Number	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Chloroform	Other Volatile Organic Compounds	Perchlorate
MW-17											
Screen 1	MW-982-040	--	--	--	--	--	--	--	3.2	--	--
Screen 2	MW-982-041	--	--	--	--	--	--	--	3.2	--	--
Screen 3	MW-982-042	--	0.9	--	--	--	--	--	4.8	0.5 Dichlorobromomethane	--
Screen 4	MW-982-043	--	**7.6**	0.6	--	--	--	--	1.5	--	17
Screen 5	MW-982-044	--	**8.8**	0.6	--	--	--	--	1.8	--	15
MW-18											
Screen 1	MW-982-045	--	--	--	--	--	--	--	0.7	--	--
Screen 2	MW-982-046	--	--	--	--	--	--	--	2.6	0.6 Dichlorobromomethane	--
Screen 3	MW-982-047	**0.5**	1.8	1.3	--	--	--	--	5.7	--	5.0
Screen 4	MW-982-048	**3.1**	0.6	1.4	--	--	--	--	0.8	--	13
Screen 5	MW-982-049	--	--	--	--	--	--	--	--	--	--
MW-19											
Screen 1	MW-982-050	--	--	--	--	--	--	--	--	--	--
Screen 2	MW-982-051	--	0.9	1.2	--	--	--	--	--	--	--
Screen 3	MW-982-052	--	--	2.5	--	--	--	--	--	--	--
Screen 4	MW-982-053	--	0.8	1.0	--	--	--	--	1.6	--	--
Screen 5	MW-982-054	--	--	0.9	--	--	--	--	0.6	--	--
MW-20											
Screen 1	MW-982-055	--	--	--	--	--	--	--	2.5	--	5.5
Screen 2	MW-982-056	--	--	--	--	--	--	--	2.7	--	--
Screen 3	MW-982-057	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-982-058	--	--	--	--	--	--	--	--	--	--b
Screen 5	MW-982-059	--	--	--	--	--	--	--	--	--	--b

--: 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: Initial value reported at 21 µg/l. After re-evaluation, laboratory determined result likely from interference (See laboratory report in Appendix D)

TABLE 3-3

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

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

Sampling Location	Sample Number	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Chloroform	Other Volatile Organic Compounds	Perchlorate
MW-21											
Screen 1	MW-982-060	--	**16**	--	--	--	--	--	1.8	--	14
Screen 2	MW-982-061	--	--	1.0	--	--	--	--	--	--	--
Screen 3	MW-982-062	--	--	1.1	--	--	--	--	--	--	--
Screen 4	MW-982-063	--	0.6	4.4	--	--	--	--	--	0.7 cis-1,2-Dichloroethene	--
Screen 5	MW-982-064	--	--	**6.5**	--	--	--	--	--	1.0 cis-1,2-Dichloroethene	5.8
MW-22											
Screen 1	MW-982-065	--	0.9	2.1	0.8	--	--	--	0.5	--	5.4
Screen 2	MW-982-066	--	--	--	--	--	--	--	--	--	--
Screen 3	MW-982-067	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-982-068	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-982-069	--	--	--	--	--	--	--	--	--	--
MW-23											
Screen 1	MW-982-070	**0.5**	**16**	0.8	1.2	--	--	--	1.9	--	16
Screen 2	MW-982-071	--	--	--	--	--	--	--	--	--	7.5
Screen 3	MW-982-072	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-982-073	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-982-074	--	--	--	--	--	--	--	--	--	--
MW-24											
Screen 1	MW-982-075	**6.7**	**5.4**	--	--	--	--	--	3.3	--	**74**
Screen 2	MW-982-076	**29**	3.3	0.9	--	--	1.4	--	9.4	--	**480**
Screen 3	MW-982-077	--	--	--	--	--	--	--	--	--	--
Screen 4	MW-982-078	--	--	--	--	--	--	--	--	--	--
Screen 5	MW-982-079	--	--	--	--	--	--	--	--	--	--

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NE: Not established

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a: Only VOCs for which MCLs have been established are listed
b: Initial value reported at 21 µg/l. After re-evaluation, laboratory determined result likely from interference (See laboratory report in Appendix D)

TABLE 3-3

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

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

Sampling Location	Sample Number	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Chloroform	Other Volatile Organic Compounds	Perchlorate
Practical Quantitation Limit		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	4.0
California Maximum Contaminated Level		0.5	5.0	5.0	5.0	0.5	6.0	1,200	100	6.0: cis-1,2-Dichloroethene [a]	18 [1]
EPA Region IX Maximum Contaminant Level		5.0	5.0	5.0	NE	5.0	7.0	NE	100	100: Dichlorobromomethane [a] 70: cis-1,2-Dichloroethene	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: Initial value reported at 21 µg/l. After re-evaluation, laboratory determined result likely from interference (See laboratory report in Appendix D)

TABLE 3-4

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

(concentrations in µg/l)

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

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
MW-1	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.9 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	1.9 Acetone	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	1.3 m,p-xylenes	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
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

--: Not detected
*: Not sampled, no water over screen
TB: Compound detected in associated trip blank
B: Compound detected in the laboratory method blank
NA: Not analyzed
NE: Not established
E: Estimated concentration; result exceeded calibration range
a: Only VOCs for which MCLs have been established are listed
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)
5: Initial value reported at 21 µg/l. After re-evaluation, laboratory determined result likely from interference (see laboratory report in Appendix D)

TABLE 3-4

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

(concentrations in µg/l)

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

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.2 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	1.0 Hexane	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	4.7 Carbon disulfide[4]	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
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**

--: Not detected
*: Not sampled, no water over screen
TB: Compound detected in associated trip blank
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1: Wells installed June-August 1997
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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)
5: Initial value reported at 21 µg/l. After re-evaluation, laboratory determined result likely from interference (see laboratory report in Appendix D)

TABLE 3-4

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

(concentrations in µg/l)

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

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 3	Aug/Sep 1996	--	--	--	--	--	--	--	--	3.0(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.5 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
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	--	--

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TB: Compound detected in associated trip blank
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NA: Not analyzed
NE: Not established
E: Estimated concentration; result exceeded calibration range
a: Only VOCs for which MCLs have been established are listed
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)
5: Initial value reported at 21 µg/l. After re-evaluation, laboratory determined result likely from interference (see laboratory report in Appendix D)

TABLE 3-4

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

(concentrations in µg/l)

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

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
MW-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**
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
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	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--

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a: Only VOCs for which MCLs have been established are listed
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(concentrations in µg/l)

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

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
MW-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	--	--	--	--	--	--	--	--	--	--
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	--	--
Screen 3	Aug/Sep 1996	**0.9**	--	--	--	--	--	--	1.3	2.9(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	1.4	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	1.1	--	NA
	Jun/Jul 1997	**0.7**	--	--	--	--	--	--	1.4	--	--
	Sep/Oct 1997	**0.6**	--	--	--	--	--	--	1.3	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	1.4	--	--
	Apr/May 1998	**1.0**	--	--	--	--	--	--	1.3	--	--
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	--	--

--: Not detected
*: Not sampled, no water over screen
TB: Compound detected in associated trip blank
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E: Estimated concentration; result exceeded calibration range
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5: Initial value reported at 21 µg/l. After re-evaluation, laboratory determined result likely from interference (see laboratory report in Appendix D)

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(concentrations in µg/l)

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

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	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	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--	--
Screen 2	Aug/Sep 1996	**0.9**	--	--	--	--	--	--	--	--	NA
	Oct/Nov 1996	**1.5**	0.6	--	--	--	--	0.5	--	--	NA
	Feb/Mar 1997	**1.1**	0.5	--	--	--	--	--	--	1.1(B) Acetone	NA
	Jun/Jul 1997	**1.0**	--	--	--	--	--	--	0.8	--	6.9
	Sep/Oct 1997	**0.8**	--	--	--	--	--	--	0.8	--	**5.8**
	Jan/Feb 1998	**1.1**	--	--	--	--	--	--	0.6	--	6.3
	Apr/May 1998	**1.2**	--	--	--	--	--	--	0.9	--	6.0
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

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(concentrations in µg/l)

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Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 4	Aug/Sep 1996	**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
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	--	--
MW-13	Aug/Sep 1996	**21**	**47**	0.6	--	**2.5**	1.5	0.7	21(TB)	--	NA
	Oct/Nov 1996	**27**	**27**	--	--	**1.9**	1.5	0.6	14	--	NA
	Feb/Mar 1997	**18**	**28**	--	--	**0.9**	1.1	0.6	9.2	--	NA
	Jun/Jul 1997	**6.4**	**24 E**	--	--	**0.9**	0.5	--	11	--	**130**
	Sep/Oct 1997	**8.2**	**19**	--	--	**1.1**	0.5	--	10	--	**210**
	Jan/Feb 1998	**12**	**5.2**	0.5	--	--	0.5 (DUP [3])	--	2.9	1.8 Freon 11	**99**
	Apr/May 1998	**13**	**17**	0.6	--	--	0.9	0.6	5.7	--	**100**
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

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(concentrations in µg/l)

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Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 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
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
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	--	--	--	--	--	--	--	--	--	--
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.1(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.6(TB) Acetone 1.3 Carbon disulfide	NA NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	4.6 Carbon disulfide[4]	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--

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(concentrations in µg/l)

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Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
MW-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	--	--	--	--	--	--	--	--	--	--
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**
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	--	--
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	--	--

--: Not detected
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(concentrations in µg/l)

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Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 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	--	--
Screen 4	Aug/Sep 1996	--	**9.5**	0.5	--	--	--	--	1.1	--	NA
	Oct/Nov 1996	--	**8.9**	--	--	--	--	--	1.5	--	NA
	Feb/Mar 1997	--	**5.8**	--	--	--	--	--	0.7	--	NA
	Jun/Jul 1997	--	4.5	--	--	--	--	--	0.6	--	13
	Sep/Oct 1997	--	**6.8**	0.5	--	--	--	--	1.0	--	16
	Jan/Feb 1998	--	**7.3**	0.6	--	--	--	--	1.2	--	16
	Apr/May 1998	--	**7.6**	0.6	--	--	--	--	1.5	--	17
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
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	--	--

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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	--	--
Screen 3	Aug/Sep 1996	**0.7**	4.7	2.8	--	--	--	--	5.1	--	NA
	Oct/Nov 1996	**0.7**	**6.4**	3.2	--	--	--	--	5.6	--	NA
	Feb/Mar 1997	**0.8**	**6.6**	2.9	--	--	--	--	5.1	--	NA
	Jun/Jul 1997	**0.6**	2.4	1.8	--	--	--	--	4.4	--	--
	Sep/Oct 1997	--	3.0	1.9	--	--	--	--	6.2	--	--
	Jan/Feb 1998	--	1.9	1.7	--	--	--	--	6.6	4.1 Unknown RT=4.33	--
	Apr/May 1998	**0.5**	1.8	1.3	--	--	--	--	5.7	--	5.0
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
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	--	--	--	--	--	--	--	--	--	--

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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)
5: Initial value reported at 21 µg/l. After re-evaluation, laboratory determined result likely from interference (see laboratory report in Appendix D)

TABLE 3-4

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

(concentrations in µg/l)

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

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
MW-19											
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	0.9	3.7(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	0.6	2.9 Acetone	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	0.8	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	2.5	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	1.4	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	0.8	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
Screen 2	Aug/Sep 1996	--	--	0.8	--	--	--	--	--	3.0(B) Acetone	NA
	Oct/Nov 1996	--	--	1.1	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	0.6	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	0.6	0.9	--	--	--	--	--	--	--
	Apr/May 1998	--	0.9	1.2	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--
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	--	--

--: Not detected
*: Not sampled, no water over screen
TB: Compound detected in associated trip blank
B: Compound detected in the laboratory method blank
NA: Not analyzed
NE: Not established
E: Estimated concentration; result exceeded calibration range
a: Only VOCs for which MCLs have been established are listed
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)
5: Initial value reported at 21 µg/l. After re-evaluation, laboratory determined result likely from interference (see laboratory report in Appendix D)

TABLE 3-4

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

(concentrations in µg/l)

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

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 5	Aug/Sep 1996	--	--	3.0	--	--	--	--	0.6	1.6(B) Unknown scan #940	NA
	Oct/Nov 1996	--	--	2.4	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	1.7	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	1.5	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	2.2	--	--	--	--	0.8	--	--
	Jan/Feb 1998	--	--	1.4	--	--	--	--	--	--	--
	Apr/May 1998	--	--	0.9	--	--	--	--	0.6	--	--
MW-20											
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	0.7	3.4(B) Acetone	NA
	Oct/Nov 1996	Not Sampled*									
	Feb/Mar 1997	--	--	--	--	--	--	--	1.4	2.4(EB) Acetone	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	0.8	--	5.7
	Sep/Oct 1997	Not Sampled*									
	Jan/Feb 1998	--	--	--	--	--	--	--	1.4	--	6.3
	Apr/May 1998	--	--	--	--	--	--	--	2.5	--	5.5
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	--	--
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	--	--	--	--	--	--	--	--	--	--

--: Not detected
*: Not sampled, no water over screen
TB: Compound detected in associated trip blank
B: Compound detected in the laboratory method blank
NA: Not analyzed
NE: Not established
E: Estimated concentration; result exceeded calibration range
a: Only VOCs for which MCLs have been established are listed
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)
5: Initial value reported at 21 µg/l. After re-evaluation, laboratory determined result likely from interference (see laboratory report in Appendix D)

TABLE 3-4

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

(concentrations in µg/l)

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

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	--	3.8(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--5
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	4.8(B) Acetone	NA
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--	NA
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	--	--	--	--	--	--	--	--
	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--5
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
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	--	--	--	--	--	--	--

--: Not detected
*: Not sampled, no water over screen
TB: Compound detected in associated trip blank
B: Compound detected in the laboratory method blank
NA: Not analyzed
NE: Not established
E: Estimated concentration; result exceeded calibration range
a: Only VOCs for which MCLs have been established are listed
1: Wells installed June-August 1997
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TABLE 3-4

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(concentrations in µg/l)

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

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 3	Aug/Sep 1996	--	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	--	--	--	--	--	--	--
Screen 4	Aug/Sep 1996	--	0.8	4.2	--	--	--	--	--	--	NA
	Oct/Nov 1996	--	--	2.5	--	--	--	--	--	1.6 Acetone	NA
	Feb/Mar 1997	--	--	1.8	--	--	--	--	--	--	NA
	Jun/Jul 1997	--	--	2.8	--	--	--	--	--	--	4.6
	Sep/Oct 1997	--	0.6	4.4	--	--	--	--	--	--	7.7
	Jan/Feb 1998	--	--	2.4	--	--	--	--	--	--	--
	Apr/May 1998	--	0.6	4.4	--	--	--	--	--	0.7 cis-1,2-Dichloroethene	--
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	5.2
	Apr/May 1998	--	--	**6.5**	--	--	--	--	--	5.0 Carbon disulfide[4] 1.0 cis-1,2-Dichloroethene	5.8
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
Screen 2	Sep/Oct 1997	--	--	--	--	--	--	--	--	0.8 Dichloromethane	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
Screen 3	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	15
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--

--: Not detected
*: Not sampled, no water over screen
TB: Compound detected in associated trip blank
B: Compound detected in the laboratory method blank
NA: Not analyzed
NE: Not established
E: Estimated concentration; result exceeded calibration range
a: Only VOCs for which MCLs have been established are listed
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)
5: Initial value reported at 21 µg/l. After re-evaluation, laboratory determined result likely from interference (see laboratory report in Appendix D)

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(concentrations in µg/l)

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

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 4	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
Screen 5	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
MW-23(1)											
Screen 1	Sep/Oct 1997	--	3.1	0.6	0.8	--	--	--	--	--	4.4
	Jan/Feb 1998	--	4.2	1.6	1.2	--	--	--	0.9	0.6 1,2,3 Trichlorobenzene	5.2
	Apr/May 1998	**0.5**	**16**	0.8	1.2	--	--	--	1.9	--	16
Screen 2	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	7.6
	Jan/Feb 1998	--	--	--	--	--	--	--	0.7	--	6.7
	Apr/May 1998	--	--	--	--	--	--	--	--	--	7.5
Screen 3	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
Screen 4	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
Screen 5	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
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**
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**
Screen 3	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--

--: Not detected
*: Not sampled, no water over screen
TB: Compound detected in associated trip blank
B: Compound detected in the laboratory method blank
NA: Not analyzed
NE: Not established
E: Estimated concentration; result exceeded calibration range
a: Only VOCs for which MCLs have been established are listed
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)
5: Initial value reported at 21 µg/l. After re-evaluation, laboratory determined result likely from interference (see laboratory report in Appendix D)

TABLE 3-4

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

(concentrations in µg/l)

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

Sampling Location	Sampling Event	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds	Perchlorate
Screen 4	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
Screen 5	Sep/Oct 1997	--	--	--	--	--	--	--	--	--	--
	Jan/Feb 1998	--	--	--	--	--	--	--	--	--	--
	Apr/May 1998	--	--	--	--	--	--	--	--	--	--
Practical Quantitation Limit		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	4.0
California Maximum Contaminant Level		0.5	5.0	5.0	5.0	0.5	6.0	1,200	100	150: Freon 11[a] 6.0: cis-1,2-Dichloroethene	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	NE

--: Not detected
*: Not sampled, no water over screen
TB: Compound detected in associated trip blank
B: Compound detected in the laboratory method blank
NA: Not analyzed
NE: Not established
E: Estimated concentration; result exceeded calibration range
a: Only VOCs for which MCLs have been established are listed
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)
5: Initial value reported at 21 µg/l. After re-evaluation, laboratory determined result likely from interference (see laboratory report in Appendix D)

TABLE 3-5

SUMMARY OF METALS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, APRIL-MAY 1998

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

Sample Location	Sample Number	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-1	MW-981-001	--	--	--	--	0.45
MW-3						
Screen 1	MW-981-002	--	--	--	--	4.77
Screen 2	MW-981-003	--	--	--	--	4.30
Screen 3	MW-981-004	--	--	--	--	4.71
Screen 4	MW-981-005	--	--	--	--	3.56
Screen 5	MW-981-006	--	0.002	--	--	1.98
MW-4						
Screen 1	MW-981-007	--	--	--	--	3.71
Screen 2	MW-981-008	--	--	--	--	1.77
Screen 2 (DUP)	MW-981-009	--	--	--	--	1.77
Screen 3	MW-981-010	--	--	--	--	3.15
Screen 4	MW-981-011	--	--	--	--	2.04
Screen 5	MW-981-012	--	--	--	--	3.78
MW-5	MW-981-013	--	--	--	--	3.13
MW-6	MW-981-014	--	--	0.012	--	2.10
MW-7	MW-981-015	--	--	--	--	4.10
MW-8	MW-981-016	--	--	0.013	--	2.60
MW-9	MW-981-017	--	--	--	--	1.33
MW-10	MW-981-018	--	--	--	--	2.60
MW-10 DUP	MW-981-019	--	0.008	0.010	--	2.60
MW-11						
Screen 1	MW-981-020	--	--	--	--	1.06
Screen 2	MW-981-021	--	--	--	--	1.44
Screen 3	MW-981-022	--	--	--	--	2.06
Screen 4	MW-981-023	--	--	--	--	4.15
Screen 5	MW-981-024	--	--	--	--	1.67
MW-12						
Screen 1	MW-981-025	--	--	0.010	--	4.78
Screen 2	MW-981-026	--	--	--	--	1.64
Screen 2 (DUP)	MW-981-027	--	--	--	--	1.64
Screen 3	MW-981-028	--	--	--	--	4.43
Screen 4	MW-981-029	--	--	--	--	1.66
Screen 5	MW-981-030	--	--	--	--	3.48

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

TABLE 3-5

SUMMARY OF METALS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, APRIL-MAY 1998

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

Sample Location	Sample Number	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-13	MW-981-031	--	--	**0.082**	0.024	3.50
MW-13 DUP	MW-981-032	--	--	**0.080**	0.024	3.50
MW-14						
Screen 1	MW-981-033	--	--	0.011	--	3.08
Screen 2	MW-981-034	--	--	--	--	4.86
Screen 3	MW-981-035	--	--	--	--	1.35
Screen 4	MW-981-036	--	--	--	--	1.30
Screen 5	MW-981-037	--	--	--	--	1.86
MW-15	MW-981-038	--	--	--	--	0.41
MW-16	MW-981-039	--	--	0.014	--	1.35
MW-17						
Screen 1	MW-981-040	--	--	--	--	1.70
Screen 2	MW-981-041	--	--	--	--	2.15
Screen 3	MW-981-042	--	--	--	--	3.61
Screen 4	MW-981-043	--	--	--	--	3.73
Screen 5	MW-981-044	--	0.002	--	--	3.71
MW-18						
Screen 1	MW-981-045	--	--	--	--	0.08
Screen 2	MW-981-046	--	--	--	--	0.05
Screen 3	MW-981-047	--	--	0.012	0.007	0.04
Screen 4	MW-981-048	--	--	--	--	0.04
Screen 5	MW-981-049	--	--	--	--	0.07
MW-19						
Screen 1	MW-981-050	--	--	--	--	2.15
Screen 2	MW-981-051	--	--	--	--	2.28
Screen 3	MW-981-052	--	--	--	--	2.35
Screen 4	MW-981-053	--	--	--	--	4.75
Screen 5	MW-981-054	--	--	--	--	4.63
MW-20						
Screen 1	MW-981-055	--	--	--	--	2.93
Screen 2	MW-981-056	--	--	--	--	1.35
Screen 3	MW-981-057	--	--	--	--	1.29
Screen 4	MW-981-058	--	--	--	--	1.71
Screen 5	MW-981-059	--	--	--	--	1.10

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

TABLE 3-5

SUMMARY OF METALS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, APRIL-MAY 1998

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

Sample Location	Sample Number	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-21						
Screen 1	MW-981-060	--	--	--	--	0.65
Screen 2	MW-981-061	--	--	--	--	1.76
Screen 3	MW-981-062	--	--	--	--	4.10
Screen 4	MW-981-063	--	--	--	--	4.64
Screen 5	MW-981-064	--	--	--	--	4.63
MW-22						
Screen 1	MW-981-065	--	--	--	--	4.62
Screen 2	MW-981-066	--	--	--	--	4.71
Screen 3	MW-981-067	--	--	--	--	2.89
Screen 4	MW-981-068	--	--	--	--	3.04
Screen 5	MW-981-069	--	--	--	--	2.91
MW-23						
Screen 1	MW-981-070	--	--	--	--	4.45
Screen 2	MW-981-071	--	--	--	--	4.69
Screen 3	MW-981-072	--	--	--	--	4.63
Screen 4	MW-981-073	--	--	--	--	4.86
Screen 5	MW-981-074	--	--	--	--	2.37
MW-24						
Screen 1	MW-981-075	--	--	--	--	2.65
Screen 2	MW-981-076	--	--	--	--	4.46
Screen 3	MW-981-077	--	--	--	--	4.90
Screen 4	MW-981-078	--	--	--	--	4.31
Screen 5	MW-981-079	--	--	--	--	3.96
Practical Quantitation Limit		0.005	0.002	0.01	0.005	
California Maximum Contaminant Level		0.050	0.050	0.05	Not Established	
EPA Maximum Contaminant Level		0.050	0.15[1]	0.10	Not Established	

(DUP): Duplicate
--: Not detected

1: Action Level: Treatment technique and public notification triggered

TABLE 3-6

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

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

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-1	Aug/Sep 1996	--	--	--	--	0.8
	Oct/Nov 1996	--	--	--	--	0.5
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	--	--	--	--	1.92
	Sep/Oct 1997	--	--	--	--	0.73
	Jan/Feb 1998	--	--	--	--	1.64
	Apr/May 1998	--	--	--	--	0.45
MW-3						
Screen 1	Aug/Sep 1996	--	--	--	--	7.2
	Oct/Nov 1996	--	--	--	--	3.1
	Feb/Mar 1997	--	--	--	--	6.1
	Jun/Jul 1997	--	--	--	--	2.61
	Sep/Oct 1997	--	--	--	--	2.12
	Jan/Feb 1998	--	--	--	--	2.87
	Apr/May 1998	--	--	--	--	4.77
Screen 2	Aug/Sep 1996	--	--	--	--	1.7
	Oct/Nov 1996	--	--	--	--	2.7
	Feb/Mar 1997	--	--	--	--	3.8
	Jun/Jul 1997	--	--	--	--	1.13
	Sep/Oct 1997	--	--	--	--	2.11
	Jan/Feb 1998	--	--	--	--	2.25
	Apr/May 1998	--	--	--	--	4.30
Screen 3	Aug/Sep 1996	--	--	--	--	5.2
	Oct/Nov 1996	--	--	--	--	2.7
	Feb/Mar 1997	--	--	--	--	1.7
	Jun/Jul 1997	--	--	--	--	3.41
	Sep/Oct 1997	--	--	--	--	4.97
	Jan/Feb 1998	--	--	--	--	4.89
	Apr/May 1998	--	--	--	--	4.71
Screen 4	Aug/Sep 1996	--	--	--	--	4.3
	Oct/Nov 1996	--	--	--	--	2.6
	Feb/Mar 1997	--	--	--	--	4.5
	Jun/Jul 1997	--	--	--	--	2.71
	Sep/Oct 1997	--	--	--	--	2.45
	Jan/Feb 1998	--	--	--	--	2.96
	Apr/May 1998	--	--	--	--	3.56
Screen 5	Aug/Sep 1996	0.011	--	--	--	1.5
	Oct/Nov 1996	0.007	--	--	--	1.9
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	0.007	--	--	--	0.83
	Sep/Oct 1997	0.010	--	--	--	0.96
	Jan/Feb 1998	0.009	0.008	--	--	2.28
	Apr/May 1998	--	0.002	--	--	1.98

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

TABLE 3-6

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

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

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-4						
Screen 1	Aug/Sep 1996	--	--	--	--	2.6
	Oct/Nov 1996	--	--	--	--	1.7
	Feb/Mar 1997	--	--	--	--	4.6
	Jun/Jul 1997	--	--	--	--	2.79
	Sep/Oct 1997	--	--	--	--	4.76
	Jan/Feb 1998	--	--	--	--	3.35
	Apr/May 1998	--	--	--	--	3.71
Screen 2	Aug/Sep 1996	--	--	0.023	--	3.8
	Oct/Nov 1996	--	--	0.014	--	4.2
	Feb/Mar 1997	--	--	0.011	--	4.5
	Jun/Jul 1997	--	--	0.013	--	2.69
	Sep/Oct 1997	--	--	0.012	--	3.51
	Jan/Feb 1998	--	--	--	--	4.84
	Apr/May 1998	--	--	--	--	1.77
Screen 3	Aug/Sep 1996	--	--	--	--	0.6
	Oct/Nov 1996	--	--	--	--	1.5
	Feb/Mar 1997	--	--	--	--	2.8
	Jun/Jul 1997	--	--	--	--	1.98
	Sep/Oct 1997	--	--	--	--	1.42
	Jan/Feb 1998	--	--	--	--	4.55
	Apr/May 1998	--	--	--	--	3.15
Screen 4	Aug/Sep 1996	--	--	--	--	3.0
	Oct/Nov 1996	--	--	--	--	1.4
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	--	--	--	--	4.62
	Sep/Oct 1997	--	--	--	--	3.28
	Jan/Feb 1998	--	--	--	--	4.73
	Apr/May 1998	--	--	--	--	2.04
Screen 5	Aug/Sep 1996	--	--	--	--	4.5
	Oct/Nov 1996	--	--	--	--	4.1
	Feb/Mar 1997	--	--	--	--	4.4
	Jun/Jul 1997	--	--	--	--	3.98
	Sep/Oct 1997	--	--	--	--	3.92
	Jan/Feb 1998	--	--	--	--	4.47
	Apr/May 1998	--	--	--	--	3.78
MW-5	Aug/Sep 1996	--	--	--	--	2.7
	Oct/Nov 1996	--	0.003	--	--	2.7
	Feb/Mar 1997	--	--	--	--	1.5
	Jun/Jul 1997	--	--	--	--	4.50
	Sep/Oct 1997	--	--	--	--	1.00
	Jan/Feb 1998	--	--	--	--	0.86
	Apr/May 1998	--	--	--	--	3.13

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

TABLE 3-6

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

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

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-6	Aug/Sep 1996	--	--	**0.050**	--	4.5
	Oct/Nov 1996	--	--	0.011	--	1.1
	Feb/Mar 1997	--	--	0.014	--	4.3
	Jun/Jul 1997	--	--	0.019	--	2.50
	Sep/Oct 1997	--	--	--	--	1.78
	Jan/Feb 1998	--	--	--	--	0.42
	Apr/May 1998	--	--	0.012	--	2.10
MW-7	Aug/Sep 1996	--	--	0.013	0.007	4.8
	Oct/Nov 1996	--	--	0.019	0.019	3.5
	Feb/Mar 1997	--	--	--	0.010	2.2
	Jun/Jul 1997	--	--	--	--	0.98
	Sep/Oct 1997	--	--	0.018	--	0.77
	Jan/Feb 1998	--	--	0.012	--	1.21
	Apr/May 1998	--	--	--	--	4.10
MW-8	Aug/Sep 1996	--	--	--	--	4.0
	Oct/Nov 1996	--	0.003	--	--	4.7
	Feb/Mar 1997	--	--	--	--	3.1
	Jun/Jul 1997	--	0.002	--	--	4.61
	Sep/Oct 1997	--	--	--	--	4.20
	Jan/Feb 1998	--	--	--	--	3.39
	Apr/May 1998	--	--	0.013	--	2.60
MW-9	Aug/Sep 1996	--	--	--	--	2.1
	Oct/Nov 1996	--	--	--	--	2.5
	Feb/Mar 1997	--	--	--	--	4.2
	Jun/Jul 1997	--	--	--	--	3.22
	Sep/Oct 1997	--	--	--	--	1.03
	Jan/Feb 1998	--	--	--	--	2.43
	Apr/May 1998	--	--	--	--	1.33
MW-10	Aug/Sep 1996	--	--	0.011	0.010	4.5
	Oct/Nov 1996	--	0.003	0.011	--	4.9
	Feb/Mar 1997	--	--	--	--	2.2
	Jun/Jul 1997	--	--	0.014	--	2.92
	Sep/Oct 1997	--	--	--	--	3.23
	Jan/Feb 1998	--	--	--	--	2.11
	Apr/May 1998	--	0.008	0.010	--	2.60
MW-11						
Screen 1	Aug/Sep 1996	--	--	--	--	4.0
	Oct/Nov 1996	--	--	--	--	2.5
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	--	--	--	--	1.53
	Sep/Oct 1997	--	--	--	--	4.64
	Jan/Feb 1998	--	--	--	--	1.03
	Apr/May 1998	--	--	--	--	1.06

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

TABLE 3-6

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

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

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 2	Aug/Sep 1996	--	--	--	--	4.5
	Oct/Nov 1996	--	--	--	--	4.7
	Feb/Mar 1997	--	--	--	--	3.1
	Jun/Jul 1997	--	--	--	--	4.67
	Sep/Oct 1997	--	--	--	--	3.00
	Jan/Feb 1998	--	--	--	--	2.37
	Apr/May 1998	--	--	--	--	1.44
Screen 3	Aug/Sep 1996	--	--	--	--	0.5
	Oct/Nov 1996	--	--	--	--	2.3
	Feb/Mar 1997	--	--	--	--	1.7
	Jun/Jul 1997	--	--	--	--	1.88
	Sep/Oct 1997	--	--	--	--	3.02
	Jan/Feb 1998	--	--	--	--	1.39
	Apr/May 1998	--	--	--	--	2.06
Screen 4	Aug/Sep 1996	--	--	--	--	3.9
	Oct/Nov 1996	--	--	--	--	3.3
	Feb/Mar 1997	--	0.009	--	--	5.2
	Jun/Jul 1997	--	--	--	--	4.80
	Sep/Oct 1997	--	--	--	--	4.95
	Jan/Feb 1998	--	--	--	--	3.43
	Apr/May 1998	--	--	--	--	4.15
Screen 5	Aug/Sep 1996	0.007	--	--	--	0.6
	Oct/Nov 1996	0.005	--	--	--	1.9
	Feb/Mar 1997	--	0.002	--	--	1.6
	Jun/Jul 1997	--	--	--	--	0.69
	Sep/Oct 1997	--	--	--	--	2.55
	Jan/Feb 1998	--	--	--	--	1.23
	Apr/May 1998	--	--	--	--	1.67
MW-12						
Screen 1	Aug/Sep 1996	--	0.004	--	--	50.4
	Oct/Nov 1996	Not Sampled*				
	Feb/Mar 1997	--	0.003	--	--	3.8
	Jun/Jul 1997	--	--	--	--	4.80
	Sep/Oct 1997	Not Sampled*				
	Jan/Feb 1998	--	--	--	--	2.63
	Apr/May 1998	--	--	0.010	--	4.78
Screen 2	Aug/Sep 1996	--	0.024	--	--	4.0
	Oct/Nov 1996	--	--	--	--	4.0
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	--	--	--	--	3.16
	Sep/Oct 1997	--	--	--	--	3.37
	Jan/Feb 1998	--	--	--	--	4.41
	Apr/May 1998	--	--	--	--	1.64

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

TABLE 3-6

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

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

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 3	Aug/Sep 1996	--	--	--	--	2.5
	Oct/Nov 1996	--	--	--	--	3.1
	Feb/Mar 1997	--	--	--	--	5.0
	Jun/Jul 1997	--	--	--	--	4.79
	Sep/Oct 1997	--	--	--	--	4.18
	Jan/Feb 1998	--	--	--	--	2.79
	Apr/May 1998	--	--	--	--	4.43
Screen 4	Aug/Sep 1996	--	0.005	--	--	1.8
	Oct/Nov 1996	--	--	--	--	0.7
	Feb/Mar 1997	--	--	--	--	2.4
	Jun/Jul 1997	--	--	--	--	2.49
	Sep/Oct 1997	--	--	--	--	1.58
	Jan/Feb 1998	--	--	--	--	3.39
	Apr/May 1998	--	--	--	--	1.66
Screen 5	Aug/Sep 1996	--	--	--	--	2.0
	Oct/Nov 1996	--	--	--	--	2.0
	Feb/Mar 1997	--	--	--	--	1.5
	Jun/Jul 1997	--	--	--	--	4.97
	Sep/Oct 1997	--	--	--	--	0.99
	Jan/Feb 1998	--	--	--	--	2.17
	Apr/May 1998	--	--	--	--	3.48
MW-13	Aug/Sep 1996	--	--	0.046	0.047	4.1
	Oct/Nov 1996	--	0.005	0.031	0.028	3.0
	Feb/Mar 1997	--	--	0.032	0.035	0.5
	Jun/Jul 1997	--	--	0.038	0.037	1.21
	Sep/Oct 1997	--	--	**0.050**	0.045	2.36
	Jan/Feb 1998	--	0.003	0.040	0.036	1.0
	Apr/May 1998	--	--	**0.082**	0.024	3.50
MW-14						
Screen 1	Aug/Sep 1996	--	--	--	--	3.3
	Oct/Nov 1996	--	--	--	--	4.5
	Feb/Mar 1997	--	--	--	--	4.3
	Jun/Jul 1997	--	--	--	--	2.21
	Sep/Oct 1997	--	--	--	--	3.89
	Jan/Feb 1998	--	0.004	--	--	4.96
	Apr/May 1998	--	--	0.011	--	3.08
Screen 2	Aug/Sep 1996	--	--	--	--	4.4
	Oct/Nov 1996	--	--	--	--	3.8
	Feb/Mar 1997	--	--	--	--	4.8
	Jun/Jul 1997	--	--	--	--	4.97
	Sep/Oct 1997	--	--	--	--	3.22
	Jan/Feb 1998	--	0.003	--	--	4.80
	Apr/May 1998	--	--	--	--	4.86

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

TABLE 3-6

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

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

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 3	Aug/Sep 1996	--	--	--	--	1.7
	Oct/Nov 1996	--	--	--	--	2.0
	Feb/Mar 1997	--	--	--	--	2.5
	Jun/Jul 1997	--	--	--	--	0.70
	Sep/Oct 1997	--	--	--	--	2.94
	Jan/Feb 1998	--	0.003	0.026	--	2.14
	Apr/May 1998	--	--	--	--	1.35
Screen 4	Aug/Sep 1996	--	--	--	--	3.1
	Oct/Nov 1996	--	--	--	--	2.5
	Feb/Mar 1997	--	--	--	--	4.1
	Jun/Jul 1997	--	--	--	--	2.31
	Sep/Oct 1997	--	--	--	--	1.73
	Jan/Feb 1998	--	0.002	--	--	2.69
	Apr/May 1998	--	--	--	--	1.30
Screen 5	Aug/Sep 1996	--	--	--	--	1.5
	Oct/Nov 1996	--	--	--	--	4.1
	Feb/Mar 1997	--	0.028	--	--	2.3
	Jun/Jul 1997	--	--	--	--	1.90
	Sep/Oct 1997	--	--	--	--	3.80
	Jan/Feb 1998	--	--	--	--	4.65
	Apr/May 1998	--	--	--	--	1.86
MW-15	Aug/Sep 1996	--	--	--	--	1.3
	Oct/Nov 1996	--	--	NA	--	0.5
	Feb/Mar 1997	--	--	--	--	2.6
	Jun/Jul 1997	--	--	--	--	0.21
	Sep/Oct 1997	--	--	--	--	0.94
	Jan/Feb 1998	--	--	--	--	1.40
	Apr/May 1998	--	--	--	--	0.41
MW-16	Aug/Sep 1996	--	--	0.018	--	3.4
	Oct/Nov 1996	Not Sampled*				
	Feb/Mar 1997	--	--	--	0.007	0.2
	Jun/Jul 1997	--	--	--	--	0.12
	Sep/Oct 1997	Not Sampled*				
	Jan/Feb 1998	--	--	--	--	1.12
	Apr/May 1998	--	--	0.014	--	1.35
MW-17						
Screen 1	Aug/Sep 1996	--	--	NA	NA	1.0
	Oct/Nov 1996	--	--	--	--	2.9
	Feb/Mar 1997	--	--	--	--	2.0
	Jun/Jul 1997	--	--	--	--	2.23
	Sep/Oct 1997	--	--	--	--	1.30
	Jan/Feb 1998	--	--	--	--	4.98
	Apr/May 1998	--	--	--	--	1.70

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

TABLE 3-6

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

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

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 2	Aug/Sep 1996	--	--	NA	NA	4.5
	Oct/Nov 1996	--	--	--	--	2.5
	Feb/Mar 1997	--	--	--	--	2.7
	Jun/Jul 1997	--	--	--	--	4.49
	Sep/Oct 1997	--	--	--	--	1.23
	Jan/Feb 1998	--	--	--	--	0.79
	Apr/May 1998	--	--	--	--	2.15
Screen 3	Aug/Sep 1996	--	0.002	NA	NA	4.9
	Oct/Nov 1996	--	--	--	--	4.8
	Feb/Mar 1997	--	--	--	--	6.0
	Jun/Jul 1997	--	--	--	--	4.83
	Sep/Oct 1997	--	--	--	0.006	2.54
	Jan/Feb 1998	--	--	--	--	3.24
	Apr/May 1998	--	--	--	--	3.61
Screen 4	Aug/Sep 1996	--	--	NA	NA	2.8
	Oct/Nov 1996	--	--	--	--	2.6
	Feb/Mar 1997	--	--	--	--	5.6
	Jun/Jul 1997	--	--	--	--	4.09
	Sep/Oct 1997	--	--	--	--	3.57
	Jan/Feb 1998	--	--	--	--	3.94
	Apr/May 1998	--	--	--	--	3.73
Screen 5	Aug/Sep 1996	--	--	NA	NA	5.0
	Oct/Nov 1996	--	0.005	--	--	5.2
	Feb/Mar 1997	--	0.003	--	--	24.5
	Jun/Jul 1997	--	--	--	--	34.0
	Sep/Oct 1997	--	--	--	--	4.83
	Jan/Feb 1998	--	--	--	--	4.75
	Apr/May 1998	--	0.002	--	--	3.71
MW-18						
Screen 1	Aug/Sep 1996	--	--	NA	NA	0.9
	Oct/Nov 1996	Not Sampled*				
	Feb/Mar 1997	--	--	--	--	1.9
	Jun/Jul 1997	--	--	--	--	0.42
	Sep/Oct 1997	Not Sampled*				
	Jan/Feb 1998	Not Sampled*				
	Apr/May 1998	--	--	--	--	0.08
Screen 2	Aug/Sep 1996	--	--	NA	NA	3.5
	Oct/Nov 1996	--	0.003	--	--	3.4
	Feb/Mar 1997	--	--	--	--	2.8
	Jun/Jul 1997	--	--	--	--	1.53
	Sep/Oct 1997	--	--	--	--	1.43
	Jan/Feb 1998	--	--	--	--	3.60
	Apr/May 1998	--	--	--	--	0.05

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

TABLE 3-6

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

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

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 3	Aug/Sep 1996	--	--	NA	NA	4.2
	Oct/Nov 1996	--	0.002	NA	--	4.0
	Feb/Mar 1997	--	--	0.015	0.007	3.3
	Jun/Jul 1997	--	--	--	--	3.88
	Sep/Oct 1997	--	--	--	--	2.05
	Jan/Feb 1998	--	--	--	--	0.58
	Apr/May 1998	--	--	0.012	0.007	0.04
Screen 4	Aug/Sep 1996	--	--	NA	NA	2.0
	Oct/Nov 1996	--	0.003	--	--	1.9
	Feb/Mar 1997	--	--	--	--	2.8
	Jun/Jul 1997	0.005	--	--	--	3.58
	Sep/Oct 1997	--	--	--	--	1.12
	Jan/Feb 1998	--	--	--	--	2.23
	Apr/May 1998	--	--	--	--	0.04
Screen 5	Aug/Sep 1996	--	--	NA	NA	2.8
	Oct/Nov 1996	--	0.002	--	--	3.6
	Feb/Mar 1997	--	--	--	--	2.9
	Jun/Jul 1997	--	--	--	--	3.97
	Sep/Oct 1997	--	--	--	--	1.65
	Jan/Feb 1998	--	--	--	--	1.63
	Apr/May 1998	--	--	--	--	0.07
MW-19						
Screen 1	Aug/Sep 1996	--	--	NA	NA	5.0
	Oct/Nov 1996	--	--	--	--	3.4
	Feb/Mar 1997	--	--	--	--	6.6
	Jun/Jul 1997	--	--	--	--	0.78
	Sep/Oct 1997	--	--	--	--	4.63
	Jan/Feb 1998	--	--	--	--	4.70
	Apr/May 1998	--	--	--	--	2.15
Screen 2	Aug/Sep 1996	--	--	NA	NA	4.5
	Oct/Nov 1996	--	--	--	--	3.6
	Feb/Mar 1997	--	--	--	--	21.9
	Jun/Jul 1997	--	--	--	--	2.80
	Sep/Oct 1997	--	--	--	--	4.57
	Jan/Feb 1998	--	--	--	--	4.72
	Apr/May 1998	--	--	--	--	2.28
Screen 3	Aug/Sep 1996	--	--	NA	NA	3.0
	Oct/Nov 1996	--	--	--	--	5.0
	Feb/Mar 1997	--	--	--	--	4.9
	Jun/Jul 1997	--	--	--	--	4.88
	Sep/Oct 1997	--	--	--	--	2.02
	Jan/Feb 1998	--	--	--	--	4.10
	Apr/May 1998	--	--	--	--	2.35

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

TABLE 3-6

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

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

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 4	Aug/Sep 1996	--	--	NA	NA	4.2
	Oct/Nov 1996	--	--	--	--	8.0
	Feb/Mar 1997	--	0.003	--	--	15.8
	Jun/Jul 1997	--	--	--	--	4.88
	Sep/Oct 1997	--	--	--	--	4.82
	Jan/Feb 1998	--	--	--	--	4.75
	Apr/May 1998	--	--	--	--	4.75
Screen 5	Aug/Sep 1996	--	--	NA	NA	4.9
	Oct/Nov 1996	--	--	NA	--	4.6
	Feb/Mar 1997	--	--	--	--	3.8
	Jun/Jul 1997	--	--	--	--	2.15
	Sep/Oct 1997	--	--	--	--	4.98
	Jan/Feb 1998	--	--	--	--	3.98
	Apr/May 1998	--	--	--	--	4.63
MW-20						
Screen 1	Aug/Sep 1996	--	--	--	NA	3.5
	Oct/Nov 1996	Not Sampled*				
	Feb/Mar 1997	--	--	--	--	2.3
	Jun/Jul 1997	--	--	--	--	0.16
	Sep/Oct 1997	Not Sampled*				
	Jan/Feb 1998	--	--	--	--	3.17
	Apr/May 1998	--	--	--	--	2.93
Screen 2	Aug/Sep 1996	--	--	NA	NA	3.9
	Oct/Nov 1996	--	--	--	--	1.1
	Feb/Mar 1997	--	--	--	--	2.1
	Jun/Jul 1997	--	--	--	--	2.54
	Sep/Oct 1997	--	--	--	--	3.57
	Jan/Feb 1998	--	--	--	--	0.44
	Apr/May 1998	--	--	--	--	1.35
Screen 3	Aug/Sep 1996	--	--	NA	NA	1.7
	Oct/Nov 1996	--	--	--	--	1.6
	Feb/Mar 1997	--	--	--	--	1.9
	Jun/Jul 1997	--	--	--	--	2.14
	Sep/Oct 1997	--	--	--	--	4.56
	Jan/Feb 1998	--	--	--	--	2.16
	Apr/May 1998	--	--	--	--	1.29
Screen 4	Aug/Sep 1996	--	--	NA	NA	1.0
	Oct/Nov 1996	--	--	--	--	1.3
	Feb/Mar 1997	--	--	--	--	3.3
	Jun/Jul 1997	--	--	--	--	1.29
	Sep/Oct 1997	--	--	--	--	1.35
	Jan/Feb 1998	--	--	--	--	0.58
	Apr/May 1998	--	--	--	--	1.71

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

TABLE 3-6

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

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

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 5	Aug/Sep 1996	--	--	NA	NA	1.8
	Oct/Nov 1996	--	--	NA	--	1.3
	Feb/Mar 1997	--	0.004	--	--	1.6
	Jun/Jul 1997	0.006	--	--	--	1.94
	Sep/Oct 1997	--	--	--	--	3.50
	Jan/Feb 1998	--	--	--	--	0.13
	Apr/May 1998	--	--	--	--	1.10
MW-21						
Screen 1	Aug/Sep 1996	--	--	NA	NA	0.9
	Oct/Nov 1996	Not Sampled*				
	Feb/Mar 1997	--	--	--	--	1.1
	Jun/Jul 1997	--	--	--	--	2.76
	Sep/Oct 1997	Not Sampled*				
	Jan/Feb 1998	--	--	--	--	0.79
	Apr/May 1998	--	--	--	--	0.65
Screen 2	Aug/Sep 1996	--	--	NA	NA	2.1
	Oct/Nov 1996	--	--	--	--	1.2
	Feb/Mar 1997	--	--	--	--	3.9
	Jun/Jul 1997	--	--	--	--	1.68
	Sep/Oct 1997	--	--	--	--	0.75
	Jan/Feb 1998	--	--	--	--	0.60
	Apr/May 1998	--	--	--	--	1.76
Screen 3	Aug/Sep 1996	--	--	NA	NA	4.6
	Oct/Nov 1996	--	--	--	--	4.9
	Feb/Mar 1997	--	0.003	--	--	4.6
	Jun/Jul 1997	--	--	--	--	1.40
	Sep/Oct 1997	--	--	--	--	3.16
	Jan/Feb 1998	--	0.003	--	--	4.79
	Apr/May 1998	--	--	--	--	4.10
Screen 4	Aug/Sep 1996	--	--	NA	NA	2.5
	Oct/Nov 1996	--	--	--	--	3.3
	Feb/Mar 1997	--	0.004	--	--	4.4
	Jun/Jul 1997	--	--	--	--	2.46
	Sep/Oct 1997	--	--	--	--	4.51
	Jan/Feb 1998	--	--	--	--	1.10
	Apr/May 1998	--	--	--	--	4.64
Screen 5	Aug/Sep 1996	--	--	NA	NA	4.9
	Oct/Nov 1996	--	--	--	--	5.0
	Feb/Mar 1997	--	--	--	--	28.0
	Jun/Jul 1997	--	--	--	--	26.4
	Sep/Oct 1997	--	--	--	--	12.19
	Jan/Feb 1998	--	--	--	--	4.94
	Apr/May 1998	--	--	--	--	4.63

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

TABLE 3-6

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

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

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-22[1]						
Screen 1	Sep/Oct 1997	--	--	--	--	33.8
	Jan/Feb 1998	--	--	--	--	4.50
	Apr/May 1998	--	--	--	--	4.62
Screen 2	Sep/Oct 1997	--	--	--	--	4.90
	Jan/Feb 1998	--	--	--	--	4.15
	Apr/May 1998	--	--	--	--	4.71
Screen 3	Sep/Oct 1997	--	--	--	--	2.96
	Jan/Feb 1998	--	--	--	--	3.75
	Apr/May 1998	--	--	--	--	2.89
Screen 4	Sep/Oct 1997	--	--	--	--	2.79
	Jan/Feb 1998	--	--	--	--	3.69
	Apr/May 1998	--	--	--	--	3.04
Screen 5	Sep/Oct 1997	--	--	--	--	4.41
	Jan/Feb 1998	--	--	--	--	2.81
	Apr/May 1998	--	--	--	--	2.91
MW-23[1]						
Screen 1	Sep/Oct 1997	--	--	--	--	3.44
	Jan/Feb 1998	--	--	--	--	4.11
	Apr/May 1998	--	--	--	--	4.45
Screen 2	Sep/Oct 1997	--	--	--	--	4.92
	Jan/Feb 1998	--	--	--	--	4.89
	Apr/May 1998	--	--	--	--	4.69
Screen 3	Sep/Oct 1997	--	--	--	--	3.04
	Jan/Feb 1998	--	--	--	--	4.60
	Apr/May 1998	--	--	--	--	4.63
Screen 4	Sep/Oct 1997	--	--	--	--	4.88
	Jan/Feb 1998	--	--	--	--	4.51
	Apr/May 1998	--	--	--	--	4.86
Screen 5	Sep/Oct 1997	--	--	--	--	1.76
	Jan/Feb 1998	--	--	--	--	1.78
	Apr/May 1998	--	--	--	--	2.37
MW-24[1]						
Screen 1	Sep/Oct 1997	--	--	--	--	1.56
	Jan/Feb 1998	--	--	--	--	3.82
	Apr/May 1998	--	--	--	--	2.65
Screen 2	Sep/Oct 1997	--	--	--	--	4.36
	Jan/Feb 1998	--	--	--	--	4.87
	Apr/May 1998	--	--	--	--	4.46
Screen 3	Sep/Oct 1997	--	--	--	--	4.63
	Jan/Feb 1998	0.006	--	--	--	4.71
	Apr/May 1998	--	--	--	--	4.90

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

TABLE 3-6

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

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

Sample Location	Sampling Date	Arsenic	Lead	Total Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
Screen 4	Sep/Oct 1997	--	--	--	--	4.03
	Jan/Feb 1998	--	--	--	--	4.87
	Apr/May 1998	--	--	--	--	4.31
Screen 5	Sep/Oct 1997	--	--	--	--	4.79
	Jan/Feb 1998	--	--	--	--	4.76
	Apr/May 1998	--	--	--	--	3.96
Practical Quantitation Limit		0.005	0.002	0.01	0.005	
Calif. Maximum Contaminant Level		0.05	0.05	0.05	NE	
EPA Maximum Contaminant Level		0.05	(a)	0.10	NE	

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

TABLE 4-1

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

(concentrations in mg/l)

Well Number	ANIONS					CATIONS					Measured Alkalinity	Measured pH
	Cl	CO_3	HCO_3	NO_3-N	SO_4	Na	Mg	K	Ca	Fe		
MW-1	17	0.36	219	1.2	40	32	19	4.3	51	--	180	7.4
MW-3												
Screen 1	9.4	0.45	219	0.57	39	22	19	3.5	53	0.86	180	7.5
Screen 2	10	0.44	213	0.74	34	20	18	3.3	51	0.36	175	7.5
Screen 3	20	3.4	163	--	20	44	12	3.3	21	0.90	135	8.5
Screen 4	9.8	2.4	188	0.15	12	53	8.9	2.5	19	0.27	155	8.3
Screen 5	9.0	12	147	--	8.5	77	0.9	1.5	4.3	0.055	125	9.1
MW-4												
Screen 1	9.2	0.15	226	2.6	37	23	18	3.2	57	0.42	185	7.0
Screen 2	70	0.12	189	8.6	81	30	29	3.0	84	0.26	155	7.0
Screen 3	20	2.2	170	6.4	8.4	33	13	2.1	30	0.15	140	8.3
Screen 4	14	1.9	188	3.8	6.7	40	10	2.2	27	0.86	155	8.2
Screen 5	8.3	1.3	201	0.99	17	38	10	2.1	36	0.73	165	8.0
MW-5	4.8	0.08	152	0.90	18	16	13	2.7	35	0.66	125	6.9
MW-6	110	0.10	250	10	150	33	44	2.5	126		205	6.8
MW-7	17	0.35	171	3.9	44	18	18	2.9	54	0.33	140	7.5
MW-8	11	0.15	183	1.4	38	17	17	2.9	48	0.22	150	7.1
MW-9	7.3	0.16	238	7.7	28	26	21	3.7	60	--	195	7.0
MW-10	14	0.09	220	4.3	42	18	21	3.6	60	--	180	6.8
MW-11												
Screen 1	18	0.98	238	0.69	39	26	20	3.4	55	0.10	195	7.8
Screen 2	14	1.0	201	0.46	34	23	18	3.2	48	0.23	165	7.9
Screen 3	12	1.7	213	0.18	25	27	14	2.3	47	0.11	175	8.1
Screen 4	10	1.9	182	--	17	26	14	2.4	36	0.55	150	8.2
Screen 5	11	1.6	158	--	17	48	2.4	1.3	24	0.20	130	8.2
MW-12												
Screen 1	14	0.23	220	0.89	38	22	18	3.5	53	1.2	180	7.2
Screen 2	13	0.45	219	1.7	35	25	18	3.3	56	0.32	180	7.5
Screen 3	16	0.73	225	1.3	32	26	17	2.9	60	0.40	185	7.7
Screen 4	13	1.2	225	1.2	28	26	14	2.6	57	0.26	185	7.9
Screen 5	12	1.4	213	0.97	18	37	12	2.1	43	0.11	175	8.0
MW-13	31	0.12	152	11	65	24	20	3.5	59	0.24	125	7.1
MW-14												
Screen 1	120	0.08	244	17	180	48	51	3.5	150	1.5	200	6.7
Screen 2	100	0.41	317	15	160	39	56	3.4	150	0.73	260	7.3
Screen 3	86	1.4	207	12	110	43	45	4.3	83	--	170	8.0
Screen 4	28	1.8	176	9.2	16	31	18	2.8	44	0.071	145	8.2
Screen 5	8	3.5	169	0.12	15	38	13	3.0	18	0.11	140	8.5

--: Not detected

TABLE 4-1

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

(concentrations in mg/l)

Well Number	ANIONS					CATIONS					Measured Alkalinity	Measured pH
	Cl	CO_3	HCO_3	NO_3-N	SO_4	Na	Mg	K	Ca	Fe		
MW-15	4.2	0.15	146	1.7	15	19	12	2.5	31	--	120	7.2
MW-16	30	0.19	146	10	39	23	19	3.0	51	--	120	7.3
MW-17												
Screen 1	9.4	0.19	183	1.3	28	15	15	2.7	46	--	150	7.2
Screen 2	6.8	11	130	0.17	24	16	15	3.4	14	0.53	110	9.1
Screen 3	8.9	0.91	177	1.2	29	21	16	2.2	41	0.43	145	7.9
Screen 4	13	1.1	207	2.4	29	31	10	2.0	49	0.17	170	7.9
Screen 5	13	1.1	207	2.2	29	33	14	2.0	45	1.4	170	7.9
MW-18												
Screen 1	9.7	0.14	171	1.7	38	15	15	3.1	45	--	140	7.1
Screen 2	12	0.55	213	1.3	42	20	19	3.3	57	0.15	175	7.6
Screen 3	16	1.0	244	0.89	37	22	20	3.5	65	0.059	200	7.8
Screen 4	9.3	2.0	194	0.56	23	34	11	1.9	35	0.23	160	8.2
Screen 5	11	5.5	168	0.20	5.8	55	5.4	2.2	13	0.16	140	8.7
MW-19												
Screen 1	5.5	0.16	152	0.92	23	14	13	2.5	38	0.29	125	7.2
Screen 2	74	0.08	250	9	110	23	42	3.0	110	0.35	205	6.7
Screen 3	87	0.28	268	10	81	31	38	3.2	110	0.16	220	7.2
Screen 4	41	0.83	256	5.1	53	26	27	2.6	77	0.98	210	7.7
Screen 5	45	1.5	237	4.6	46	30	28	2.8	67	0.69	195	8.0
MW-20												
Screen 1	95	0.41	201	9.6	116	21	30	3.9	96	0.097	165	7.5
Screen 2	17	0.49	189	3.2	34	15	18	2.7	56	--	155	7.6
Screen 3	28	3.5	212	1.5	23	62	16	3.0	24	--	175	8.4
Screen 4	10	3.2	157	--	21	66	3	1.6	9.9	0.068	130	8.5
Screen 5	8.9	16	189	--	21	78	1.7	1.7	6.4	--	160	9.1
MW-21												
Screen 1	72	0.09	213	15	102	34	34	2.6	100	--	175	6.8
Screen 2	120	0.19	287	9.4	145	54	45	3.7	130	--	235	7.0
Screen 3	89	0.61	299	8.4	81	42	38	3.9	110	0.14	245	7.5
Screen 4	68	0.42	256	10	72	32	33	2.8	110	0.16	210	7.4
Screen 5	63	0.63	244	9.9	76	38	33	3.6	89	2.0	200	7.6
MW-22												
Screen 1	120	0.70	341	11	180	37	57	4.2	160	0.52	280	7.5
Screen 2	55	1.0	201	9.6	56	34	28	3.0	67	0.59	165	7.9
Screen 3	24	1.4	176	7.7	16	36	15	2.6	41	0.40	145	8.1
Screen 4	11	0.70	171	4.4	6.8	30	11	2.0	34	0.64	140	7.8
Screen 5	9.1	9.6	148	--	44	82	3.4	1.8	11	0.60	125	9.0

--: Not detected

TABLE 4-1

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

(concentrations in mg/l)

Well Number	ANIONS					CATIONS					Measured Alkalinity	Measured pH
	Cl	CO_3	HCO_3	NO_3-N	SO_4	Na	Mg	K	Ca	Fe		
MW-23												
Screen 1	93	0.13	244	14	140	35	44	3.1	120	1.5	200	6.9
Screen 2	100	0.29	226	14	140	36	42	3.0	120	0.62	185	7.3
Screen 3	24	1.1	176	9.2	13	30	16	2.2	45	1.0	145	8.0
Screen 4	12	0.67	164	5.2	6.3	28	11	2.2	31	0.29	135	7.8
Screen 5	37	33	200	--	19	120	2.2	3.7	5.3	0.14	175	9.4
MW-24												
Screen 1	13	0.46	177	2.7	35	18	17	2.6	47	0.49	145	7.6
Screen 2	24	6.4	156	2.4	12	45	9.8	3.0	18	1.5	130	8.8
Screen 3	26	0.78	189	1.8	16	42	13	2.2	37	1.1	155	7.8
Screen 4	10	4.7	181	2.4	7.7	42	10	2.3	21	0.52	150	8.6
Screen 5	8.5	0.85	207	0.91	20	40	9.2	2.0	38	0.41	170	7.8
Detection Limit	1.0	0.001	0.001	0.10	2.0	1.0	1.0	1.0	1.0	0.10	2.0	0.1

--: Not detected

TABLE 4-2
GENERAL WATER TYPES OBSERVED DURING THE APRIL-MAY 1998 SAMPLING EVENT
(AS INTERPRETED WITH STIFF DIAGRAMS)

SHALLOW WELLS:	WATER TYPE[1]
MW-1	Type 1
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-13	Type 1/3
MW-15	Type 1
MW-16	Type 1/3

DEEP MULTI-PORT WELL/SCREEN:	WATER 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-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

DEEP MULTI-PORT WELL/SCREEN:	WATER TYPE[1]
MW-14	
Screen 1	Type 3
Screen 2	Type 3
Screen 3	Type 3/1
Screen 4	Type 1
Screen 5	Type 2
MW-17	
Screen 1	Type 1
Screen 2	Type 1
Screen 3	Type 1
Screen 4	Type 1/2
Screen 5	Type 1/2
MW-18	
Screen 1	Type 1
Screen 2	Type 1
Screen 3	Type 1
Screen 4	Type 1/2
Screen 5	Type 2
MW-19	
Screen 1	Type 1
Screen 2	Type 3/1
Screen 3	Type 3/1
Screen 4	Type 1/3
Screen 5	Type 1/3
MW-20	
Screen 1	Type 3
Screen 2	Type 3/1
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

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

TABLE 4-2
GENERAL WATER TYPES OBSERVED DURING THE APRIL-MAY 1998 SAMPLING EVENT
(AS INTERPRETED WITH STIFF DIAGRAMS)

DEEP MULTI-PORT WELL/SCREEN:	WATER TYPE[1]
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 3
Screen 2	Type 3
Screen 3	Type 1/2/3
Screen 4	Type 1/2
Screen 5	Type 2
MW-24	
Screen 1	Type 1
Screen 2	Type 2/3
Screen 3	Type 2/3
Screen 4	Type 2
Screen 5	Type 1/2

1: General Water Types:

Type 1: Calcium-bicarbonate groundwater

Type 2: Sodium-bicarbonate groundwater

Type 3: Calcium-bicarbonate/chloride/sulfate/nitrate groundwater

TABLE 4-3

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

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

Well Number	Total Anions	Total Cations	Total Ions	Charge Balance	Measured TDS	Calculated TDS	Measured TDS/ Calculated TDS
MW-1	5.0	5.6	10.6	5.8	290	277	1.0
MW-3							
Screen 1	4.7	5.3	10.0	5.6	280	260	1.1
Screen 2	4.5	5.0	9.5	5.2	260	246	1.0
Screen 3	3.7	4.0	7.7	4.4	220	205	1.1
Screen 4	3.6	4.1	7.7	5.9	220	200	1.1
Screen 5	2.9	3.7	6.6	11.7	200	186	1.1
MW-4							
Screen 1	4.9	4.5	9.4	4.7	290	271	1.1
Screen 2	7.4	8.0	15.4	3.7	480	428	1.1
Screen 3	4.0	4.1	8.1	0.7	230	220	1.0
Screen 4	3.9	4.0	7.9	0.9	220	212	1.0
Screen 5	4.0	4.3	8.3	4.0	240	217	1.1
MW-5	3.1	3.6	6.7	7.2	200	169	1.2
MW-6	11	11.6	22.6	2.6	690	633	1.1
MW-7	4.5	5.0	9.5	5.7	280	256	1.1
MW-8	4.2	4.6	8.8	4.6	260	230	1.1
MW-9	5.2	6.0	11.2	6.7	320	297	1.1
MW-10	5.2	5.6	10.8	3.7	320	286	1.1
MW-11							
Screen 1	5.3	5.6	10.9	2.8	320	282	1.1
Screen 2	4.4	5.0	9.4	5.9	270	242	1.1
Screen 3	4.4	4.7	9.6	3.4	290	234	1.2
Screen 4	3.6	4.1	7.7	6.9	210	197	1.1
Screen 5	3.3	3.5	6.8	3.2	170	183	0.9
MW-12							
Screen 1	4.9	5.1	10.0	2.0	290	262	1.1
Screen 2	4.8	5.5	10.3	6.3	300	266	1.1
Screen 3	4.9	5.6	10.5	6.7	300	274	1.1
Screen 4	4.7	5.2	9.9	5.0	290	258	1.1
Screen 5	4.3	4.8	9.1	5.5	300	234	1.3
MW-13	5.5	5.7	11.2	2.0	370	326	1.1
MW-14							
Screen 1	12.3	13.9	26.2	6.1	710	749	0.9
Screen 2	12.4	13.9	26.3	5.7	700	732	1.0
Screen 3	9.0	9.8	18.8	4.4	490	527	0.9
Screen 4	4.7	5.1	9.8	4.1	300	269	1.1
Screen 5	3.4	3.7	7.1	4.2	200	187	1.1

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

TABLE 4-3

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

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

Well Number	Total Anions	Total Cations	Total Ions	Charge Balance	Measured TDS	Calculated TDS	Measured TDS/ Calculated TDS
MW-15	3.0	3.4	6.4	6.7	190	163	1.2
MW-16	4.8	5.2	10.0	3.9	320	281	1.1
MW-17							
Screen 1	3.9	4.3	8.2	4.4	220	212	1.0
Screen 2	2.9	3.1	6.0	2.5	170	155	1.0
Screen 3	3.8	4.3	8.1	6.6	260	213	1.2
Screen 4	4.5	5.0	9.5	5.3	280	248	1.1
Screen 5	4.5	4.9	9.4	4.1	240	250	1.0
MW-18							
Screen 1	4.0	4.2	8.2	2.7	220	218	1.0
Screen 2	4.8	5.4	10.2	5.6	280	265	1.0
Screen 3	5.3	5.9	11.2	5.7	290	288	1.0
Screen 4	4.0	4.2	8.2	2.2	210	214	1.0
Screen 5	3.3	3.5	6.8	3.5	180	181	1.0
MW-19							
Screen 1	3.2	3.6	6.8	6.4	210	175	1.2
Screen 2	9.1	10.0	19.1	4.7	580	525	1.1
Screen 3	9.3	10.1	19.4	4.1	560	527	1.1
Screen 4	6.8	7.3	14.1	3.3	420	377	1.1
Screen 5	6.5	7.0	13.5	3.9	380	358	1.1
MW-20							
Screen 1	7.8	8.3	16.1	3.0	400	503	0.8
Screen 2	4.5	5.0	9.5	5.3	260	250	1.0
Screen 3	4.9	5.3	10.2	3.8	250	270	0.9
Screen 4	3.3	3.6	7.0	5.0	200	192	1.0
Screen 5	3.9	3.9	7.8	2.4	220	227	1.0
MW-21							
Screen 1	8.7	9.3	18.0	3.5	490	516	0.9
Screen 2	11.8	12.6	24.4	3.3	700	680	1.0
Screen 3	9.7	10.6	20.3	4.4	610	549	1.1
Screen 4	8.3	9.7	18.0	7.7	530	489	1.1
Screen 5	8.1	8.9	17.0	4.7	490	469	1.0
MW-22							
Screen 1	13.5	14.4	27.9	3.2	820	776	1.1
Screen 2	6.7	7.2	13.9	3.7	390	386	1.0
Screen 3	4.5	4.9	9.4	4.4	260	257	1.0
Screen 4	3.6	4.0	7.6	4.8	210	200	1.0
Screen 5	3.7	4.4	8.1	9.1	230	234	1.0

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

TABLE 4-3

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

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

Well Number	Total Anions	Total Cations	Total Ions	Charge Balance	Measured TDS	Calculated TDS	Measured TDS/ Calculated TDS
MW-23							
Screen 1	10.5	11.2	21.7	3.2	630	619	1.0
Screen 2	10.4	11.1	21.5	3.3	650	615	1.1
Screen 3	4.5	4.9	9.4	4.6	280	260	1.1
Screen 4	3.5	3.7	7.2	3.2	210	195	0.9
Screen 5	4.9	5.8	10.7	8.1	280	317	0.9
MW-24							
Screen 1	4.2	4.6	8.8	4.5	250	233	1.1
Screen 2	3.7	3.7	7.4	0.5	220	267	1.1
Screen 3	4.3	4.8	9.1	5.4	250	239	1.0
Screen 4	3.6	3.8	7.4	2.2	220	207	1.1
Screen 5	4.1	4.5	8.5	4.0	270	225	1.2

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

TABLE 5-1

GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS, APRIL 17, 1998

Well Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-1	4/17/98	22.63	1116.69	1094.06
MW-3				
Screen 1 (top)	4/17/98	93.15	1100.34	1007.19
Screen 2	4/17/98	106.26	1100.34	994.08
Screen 3	4/17/98	111.05	1100.34	989.29
Screen 4	4/17/98	178.20	1100.34	922.14
Screen 5	4/17/98	204.75	1100.34	895.59
MW-4				
Screen 1 (top)	4/17/98	62.84	1082.84	1020.00
Screen 2	4/17/98	84.47	1082.84	998.37
Screen 3	4/17/98	89.15	1082.84	993.69
Screen 4	4/17/98	97.65	1082.84	985.19
Screen 5	4/17/98	164.81	1082.84	918.03
MW-5	4/17/98	48.86	1071.62	1022.76
MW-6	4/17/98	177.21	1188.54	1011.33
MW-7	4/17/98	200.91	1212.90	1011.99
MW-8	4/17/98	124.51	1139.55	1015.04
MW-9	4/17/98	19.16	1106.06	1086.90
MW-10	4/17/98	70.97	1087.73	1016.76
MW-11				
Screen 1 (top)	4/17/98	107.25	1139.30	1032.05
Screen 2	4/17/98	131.71	1139.30	1007.59
Screen 3	4/17/98	145.71	1139.30	993.59
Screen 4	4/17/98	152.77	1139.30	986.53
Screen 5	4/17/98	205.76	1139.30	933.54
MW-12				
Screen 1 (top)	4/17/98	79.80	1102.14	1022.34
Screen 2	4/17/98	101.65	1102.14	1000.49
Screen 3	4/17/98	106.15	1102.14	995.99
Screen 4	4/17/98	118.99	1102.14	983.15
Screen 5	4/17/98	171.38	1102.14	930.76
MW-13	4/17/98	171.70	1183.49	1011.79

TABLE 5-1

GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS, APRIL 17, 1998

Well Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-14				
Screen 1 (top)	4/17/98	160.67	1173.47	1012.80
Screen 2	4/17/98	159.83	1173.47	1013.64
Screen 3	4/17/98	159.34	1173.47	1014.13
Screen 4	4/17/98	159.38	1173.47	1014.09
Screen 5	4/17/98	159.90	1173.47	1013.57
MW-15	4/17/98	28.93	1120.68	1091.75
MW-16	4/17/98	225.30	1236.29	1010.99
MW-17				
Screen 1 (top)	4/17/98	183.21	1191.21	1008.00
Screen 2	4/17/98	207.95	1191.21	983.26
Screen 3	4/17/98	228.05	1191.21	963.16
Screen 4	4/17/98	262.66	1191.21	928.55
Screen 5	4/17/98	270.43	1191.21	920.78
MW-18				
Screen 1 (top)	4/17/98	243.43	1225.41	981.98
Screen 2	4/17/98	243.58	1225.41	981.83
Screen 3	4/17/98	243.67	1225.41	981.74
Screen 4	4/17/98	269.76	1225.41	955.65
Screen 5	4/17/98	279.84	1225.41	945.57
MW-19				
Screen 1 (top)	4/17/98	142.82	1142.94	1000.12
Screen 2	4/17/98	169.19	1142.94	973.75
Screen 3	4/17/98	173.72	1142.94	969.22
Screen 4	4/17/98	252.01	1142.94	890.93
Screen 5	4/17/98	254.59	1142.94	888.35
MW-20				
Screen 1 (top)	4/17/98	204.94	1165.05	960.11
Screen 2	4/17/98	202.12	1165.05	962.93
Screen 3	4/17/98	208.07	1165.05	956.98
Screen 4	4/17/98	214.46	1165.05	950.59
Screen 5	4/17/98	195.46	1165.05	969.59

TABLE 5-1

GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS, APRIL 17, 1998

Well Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-21				
Screen 1 (top)	4/17/98	42.68	1059.10	1016.42
Screen 2	4/17/98	43.38	1059.10	1015.72
Screen 3	4/17/98	44.93	1059.10	1014.17
Screen 4	4/17/98	46.53	1059.10	1012.57
Screen 5	4/17/98	46.64	1059.10	1012.46
MW-22				
Screen 1 (top)	4/17/98	166.56	1176.98	1010.42
Screen 2	4/17/98	168.89	1176.98	1008.09
Screen 3	4/17/98	168.70	1176.98	1008.28
Screen 4	4/17/98	184.46	1176.98	992.52
Screen 5	4/17/98	194.45	1176.98	982.53
MW-23				
Screen 1 (top)	4/17/98	96.07	1108.84	1012.77
Screen 2	4/17/98	103.67	1108.84	1005.17
Screen 3	4/17/98	104.77	1108.84	1004.07
Screen 4	4/17/98	124.81	1108.84	984.03
Screen 5	4/17/98	124.78	1108.84	984.06
MW-24				
Screen 1 (top)	4/17/98	188.24	1200.94	1012.70
Screen 2	4/17/98	196.70	1200.94	1004.24
Screen 3	4/17/98	200.36	1200.94	1000.58
Screen 4	4/17/98	222.27	1200.94	978.67
Screen 5	4/17/98	242.41	1200.94	958.53

TABLE 5-2

GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS
MAY 18, 1998

Well Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-1	5/18/98	21.97	1116.69	1094.72
MW-3				
Screen 1 (top)	5/18/98	89.90	1100.34	1010.47
Screen 2	5/18/98	103.40	1100.34	996.93
Screen 3	5/18/98	109.00	1100.34	991.35
Screen 4	5/18/98	183.45	1100.34	916.88
Screen 5	5/18/98	213.57	1100.34	886.75
MW-4				
Screen 1 (top)	5/18/98	59.43	1082.84	1023.41
Screen 2	5/18/98	81.95	1082.84	1000.88
Screen 3	5/18/98	87.54	1082.84	995.33
Screen 4	5/18/98	96.94	1082.84	985.90
Screen 5	5/18/98	170.24	1082.84	912.63
MW-5	5/18/98	46.61	1071.62	1025.01
MW-6	5/18/98	174.83	1188.54	1013.71
MW-7	5/18/98	194.90	1212.90	1018.00
MW-8	5/18/98	119.09	1139.55	1020.46
MW-9	5/18/98	18.54	1106.06	1087.52
MW-10	5/18/98	68.61	1087.73	1019.12
MW-11				
Screen 1 (top)	5/18/98	102.68	1139.30	1036.62
Screen 2	5/18/98	127.90	1139.30	1011.40
Screen 3	5/18/98	145.16	1139.30	994.15
Screen 4	5/18/98	155.60	1139.30	983.72
Screen 5	5/18/98	210.46	1139.30	928.86
MW-12				
Screen 1 (top)	5/18/98	76.17	1102.14	1025.96
Screen 2	5/18/98	98.30	1102.14	1003.81
Screen 3	5/18/98	103.40	1102.14	998.76
Screen 4	5/18/98	118.67	1102.14	983.45
Screen 5	5/18/98	176.52	1102.14	925.62
MW-13	5/18/98	166.68	1183.49	1016.81

TABLE 5-2

GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS
MAY 18, 1998

Well Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-14				
Screen 1 (top)	5/18/98	159.64	1173.47	1013.85
Screen 2	5/18/98	159.58	1173.47	1013.89
Screen 3	5/18/98	159.87	1173.47	1013.62
Screen 4	5/18/98	160.00	1173.47	1013.48
Screen 5	5/18/98	161.28	1173.47	1012.16
MW-15	5/18/98	28.11	1120.68	1092.57
MW-16	5/18/98	219.78	1236.29	1016.51
MW-17				
Screen 1 (top)	5/18/98	176.22	1191.21	1014.97
Screen 2	5/18/98	203.22	1191.21	987.98
Screen 3	5/18/98	222.55	1191.21	968.67
Screen 4	5/18/98	265.09	1191.21	926.13
Screen 5	5/18/98	275.29	1191.21	915.93
MW-18				
Screen 1 (top)	5/18/98	233.98	1225.41	991.43
Screen 2	5/18/98	235.06	1225.41	990.35
Screen 3	5/18/98	237.65	1225.41	987.77
Screen 4	5/18/98	266.23	1225.41	959.18
Screen 5	5/18/98	283.72	1225.41	941.70
MW-19				
Screen 1 (top)	5/18/98	140.59	1142.94	1002.36
Screen 2	5/18/98	167.48	1142.94	975.46
Screen 3	5/18/98	173.05	1142.94	969.89
Screen 4	5/18/98	260.21	1142.94	882.73
Screen 5	5/18/98	263.06	1142.94	879.85
MW-20				
Screen 1 (top)	5/18/98	199.05	1165.05	966.01
Screen 2	5/18/98	196.42	1165.05	968.64
Screen 3	5/18/98	207.47	1165.05	957.58
Screen 4	5/18/98	224.04	1165.05	941.04
Screen 5	5/18/98	192.78	1165.05	972.29

TABLE 5-2

GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS
MAY 18, 1998

Well Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-21				
Screen 1 (top)	5/18/98	44.14	1059.10	1014.95
Screen 2	5/18/98	44.55	1059.10	1014.54
Screen 3	5/18/98	46.35	1059.10	1012.74
Screen 4	5/18/98	48.23	1059.10	1010.89
Screen 5	5/18/98	48.28	1059.10	1010.80
MW-22				
Screen 1 (top)	5/18/98	162.45	1176.98	1014.54
Screen 2	5/18/98	167.42	1176.98	1009.55
Screen 3	5/18/98	167.69	1176.98	1009.29
Screen 4	5/18/98	184.86	1176.98	992.13
Screen 5	5/18/98	195.60	1176.98	981.37
MW-23				
Screen 1 (top)	5/18/98	92.61	1108.84	1016.24
Screen 2	5/18/98	102.28	1108.84	1006.57
Screen 3	5/18/98	103.82	1108.84	1005.01
Screen 4	5/18/98	125.92	1108.84	982.93
Screen 5	5/18/98	126.29	1108.84	982.56
MW-24				
Screen 1 (top)	5/18/98	182.94	1200.94	1018.00
Screen 2	5/18/98	194.21	1200.94	1006.74
Screen 3	5/18/98	199.00	1200.94	1001.95
Screen 4	5/18/98	223.68	1200.94	977.25
Screen 5	5/18/98	245.28	1200.94	955.65

FIGURES

Jet Propulsion Laboratory

Explanation

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

N

Scale in Feet

0 1000 2000 ft.

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

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

Lincoln Ave. Water Co. Well #3

City of Pasadena Ventura Well

Lincoln Ave. Water Co. Well #5

City of Pasadena Windsor Well

Rubio Cañon Land and Water Co. #4 #7

Los Flores Water Co. Well #2 #2

Oak Grove Ranger Station

Oak Grove Park

Devils Gate Reservoir

Spreading Grounds

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

Figure 1-1

Locations of JPL Groundwater Monitoring Wells and Nearby Municipal Production Wells

Jet Propulsion Laboratory
Pasadena, California

Jet Propulsion Laboratory

MW-24
1: 6.7
2:
3:
4:
5:

MW-7 31

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

MW-1 --

MW-16 42

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

MW-15 --

MW-13 13

MW-9 --

MW-6 --

MW-8 1.3

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

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

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

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

MW-2

MW-23
1: 0.5
2:
3:
4:
5:

MW-10 --

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

MW-5 --

MH-01

City of Pasadena Arroyo Well

City of Pasadena Well 52

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

Lincoln Ave. Water Co. Well #3

Lincoln Ave. Water Co. Well #5

City of Pasadena Ventura Well

City of Pasadena Windsor Well

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

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

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

La Canada Irrigation District
Well #1: -- 9/97
Well #6: *Out of Service*

Valley Water Company
Well #3: -- 9/97
Well #2: -- 9/97
Well #4: -- 7/97
Well #1: -- 8/97

Rubio Cañon Land and Water Co.
Well #4: -- 12/94
Well #7: -- 12/97

Los Flores Water Co. Well #2
-- 1/98

Oak Grove Ranger Station

Oak Grove Park

Devils Gate Reservoir

Spreading Grounds

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

MCL
20
5

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- -- Not Detected
- NS Not Sampled, no water over screen
- E Estimated concentration, result exceeded high standard
- Limit of Detection 0.5 µg/L
- 10 Concentration Contour (µg/L)
- MCL Maximum Contaminant Level (0.5 µg/L)

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

Scale in Feet
0 1000 2000 ft.

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

Figure 3-1

Contours of Carbon Tetrachloride Concentrations in Aquifer Layer 1 April - May 1998

Jet Propulsion Laboratory
Pasadena, California

Jet Propulsion Laboratory

MW-24
1:
2: 29
3: --
4:
5:

MW-7

MW-11
1:
2: 1.0
3: 1.0
4:
5:

MW-1

MW-15

MW-16

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

MW-13

MW-6

MW-8

MW-9

MW-12
1:
2: 1.1
3: 25
4: 4.3
5:

MW-3
1:
2: --
3: 3.6
4:
5:

MW-18
1:
2:
3: 0.5
4:
5:

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

MW-2

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

MH-01

MW-4
1:
2: 2.8
3: --
4: --
5:

MW-10

MW-5

La Canada Irrigation District
Well #1: -- 3/97
Well #6: *Out of Service*

Valley Water Company
Well #3: -- 9/97
Well #2: -- 9/97
Well #4: -- 7/97
Well #1: -- 7/97

City of Pasadena Arroyo Well
4.7 6/97

City of Pasadena Well 52
0.7 11/97

Lincoln Ave. Water Co. Well #3
0.8 1/98

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

Lincoln Ave. Water Co. Well #5
-- 6/97

City of Pasadena Ventura Well
-- 10/97

City of Pasadena Windsor Well
-- 9/97

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

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

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

Rubio Cañon Land and Water Co.
Well #4: -- 12/94
Well #7: -- 12/97

Los Flores Water Co. Well #2
-- 1/98

Oak Grove Ranger Station

Oak Grove Park

Devils Gate Reservoir

Spreading Grounds

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

MCL
20
5

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- -- Not Detected
- E Estimated concentration, result exceeded high standard
- Limit of Detection 0.5 µg/L
- 10 Concentration Contour (µg/L)
- MCL Maximum Contaminant Level (0.5 µg/L)

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

Scale in Feet
0 1000 2000 ft.

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

Figure 3-2

Contours of Carbon Tetrachloride Concentrations in Aquifer Layer 2 April - May 1998

Jet Propulsion Laboratory
Pasadena, California

Jet Propulsion Laboratory

Explanation

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

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

Scale in Feet
0 1000 2000 ft.

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

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

MW-7

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

MW-1

MW-16

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

MW-15

MW-13

MW-8

MW-9

MW-6

MCL

MW-12
1:
2:
3:
4:
5: 1.7

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

MW-18
1:
2:
3:
4: 3.1
5: --

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

MW-2

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

MH-01

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

City of Pasadena Arroyo Well
4.7 6/97

MW-10

MW-5

City of Pasadena Well 52
0.7 1/98

Lincoln Ave. Water Co. Well #3
0.8 1/98

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

Lincoln Ave. Water Co. Well #5
-- 6/97

City of Pasadena Ventura Well
-- 10/97

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

City of Pasadena Windsor Well
-- 9/97

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

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

La Canada Irrigation District
Well #1: -- 3/97
Well #6: *Out of Service*

Valley Water Company
Well #3: -- 9/97
Well #2: -- 9/97
Well #4: -- 7/97
Well #1: -- 8/97

Rubio Cañon Land and Water Co.
Well #4: -- 12/94
Well #7: -- 12/97

Los Flores Water Co. Well #2
-- 1/98

Oak Grove Ranger Station

Oak Grove Park

Devils Gate Reservoir

Spreading Grounds

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

Figure 3-3

Contours of Carbon Tetrachloride Concentrations in Aquifer Layer 3 April - May 1998

Jet Propulsion Laboratory
Pasadena, California

Jet Propulsion Laboratory

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- -- Not Detected
- NS Not Sampled, no water over screen
- Limit of Detection 0.5 µg/L
- 10 Concentration Contour (µg/L)
- MCL Maximum Contaminant Level (5 µg/L)

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

Scale in Feet: 0 — 1000 — 2000 ft.

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

MW-24
1: 5.4
2:
3:
4:
5:

MW-7
13

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

MW-1
--

MW-15
--

MW-9
--

MW-22
1: 0.9
2:
3:
4:
5:

MW-16
12

MW-13
17

MW-6
0.7

MW-8
1.3

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

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

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

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

MW-23
1: 16
2:
3:
4:
5:

MW-2

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

MH-01

MW-10
--

MW-5
--

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

MW-21
1: 16
2:
3:
4:
5:

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

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

La Canada Irrigation District
Well #1: -- 3/97
Well #6: *Out of Service*

Valley Water Company
Well #3: -- 9/97
Well #2: 1.0 9/97
Well #4: 2.6 7/97
Well #1: 3.5 7/97

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.
Well #4: -- 12/94
Well #7: -- 12/97

Los Flores Water Co. Well #2
-- 1/98

Oak Grove Ranger Station

Oak Grove Park

Devils Gate Reservoir

Spreading Grounds

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

Figure 3-4

Contours of Trichloroethene Concentrations in Aquifer Layer 1 April - May 1998

Jet Propulsion Laboratory
Pasadena, California

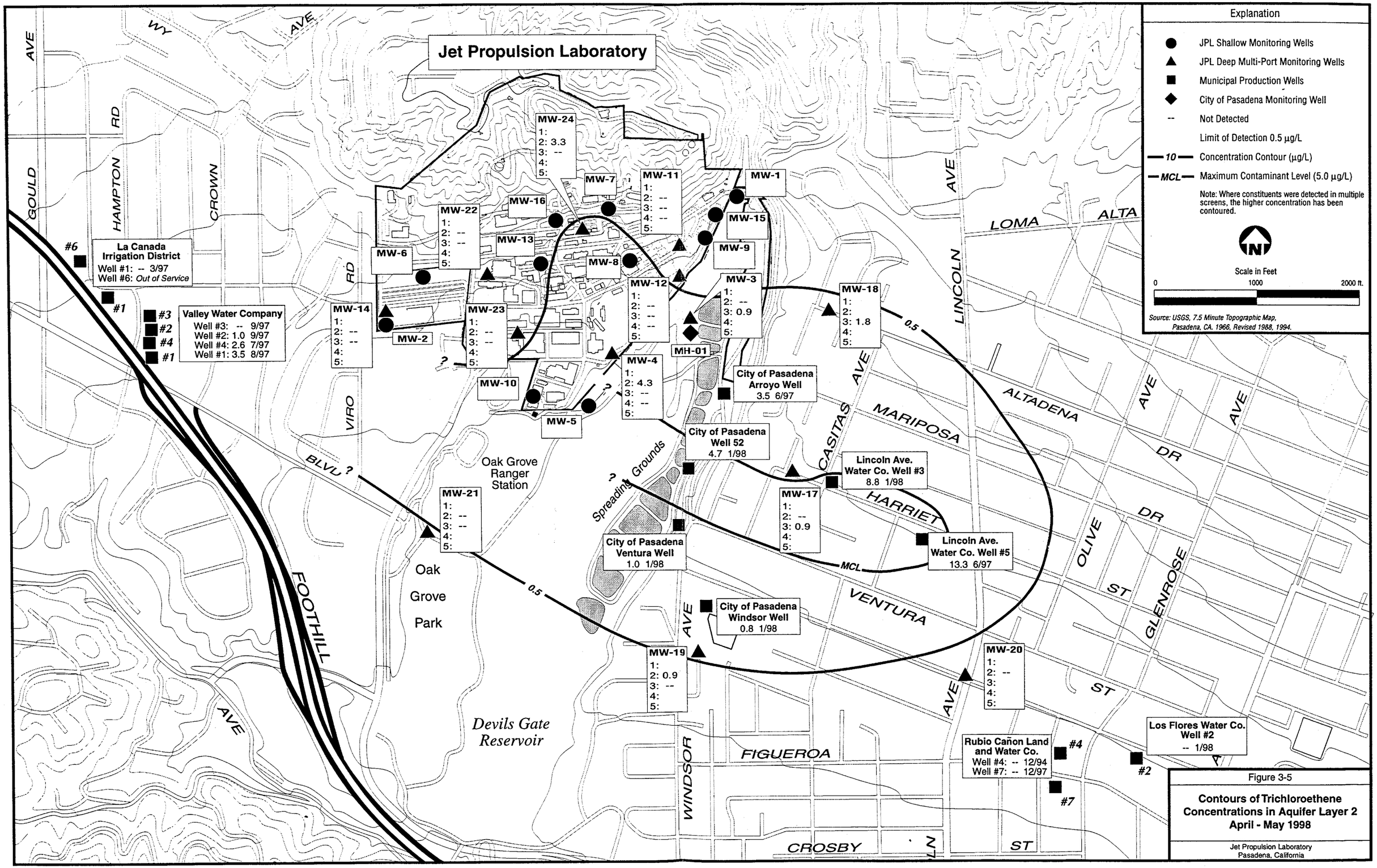


Figure 3-5

Contours of Trichloroethene Concentrations in Aquifer Layer 2 April - May 1998

Jet Propulsion Laboratory
Pasadena, California

Jet Propulsion Laboratory

Explanation

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

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

N

Scale in Feet

0 1000 2000 ft.

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

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

MW-7

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

MW-1

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

MW-16

MW-15

MW-13

MW-9

MW-6

MW-8

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

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

MW-18
1:
2:
3:
4: 0.6
5: --

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

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

MW-2

MH-01

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

MW-10

MW-5

La Canada Irrigation District
Well #1: -- 3/97
Well #6: *Out of Service*

Valley Water Company
Well #3: -- 9/97
Well #2: 1.0 9/97
Well #4: 2.6 7/97
Well #1: 3.5 8/97

City of Pasadena Arroyo Well
3.5 6/97

City of Pasadena Well 52
4.7 6/97

Lincoln Ave. Water Co. Well #3
8.8 1/98

MW-17
1:
2:
3:
4: 7.6
5: 8.8

Lincoln Ave. Water Co. Well #5
13.3 6/97

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

City of Pasadena Ventura Well
1.0 1/98

City of Pasadena Windsor Well
0.8 9/97

MW-19
1:
2:
3:
4: 0.8
5: --

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

Rubio Cañon Land and Water Co.
Well #4: -- 12/94
Well #7: -- 12/97

Los Flores Water Co. Well #2
-- 1/98

Oak Grove Ranger Station

Oak Grove Park

Devils Gate Reservoir

Spreading Grounds

0.5

MCL

GOULD AVE

WY AVE

HAMPTON RD

CROWN RD

VIRO RD

BLVD

FOOTHILL AVE

LINCOLN AVE

LOMA ALTA

ALTADENA DR

MARIPOSA AVE

CASITAS AVE

HARRIET

VENTURA

OLIVE DR

ST

GLENROSE AVE

FIGUEROA ST

WINDSOR AVE

CROSBY ST

Figure 3-6

Contours of Trichloroethene Concentrations in Aquifer Layer 3 April - May 1998

Jet Propulsion Laboratory
Pasadena, California

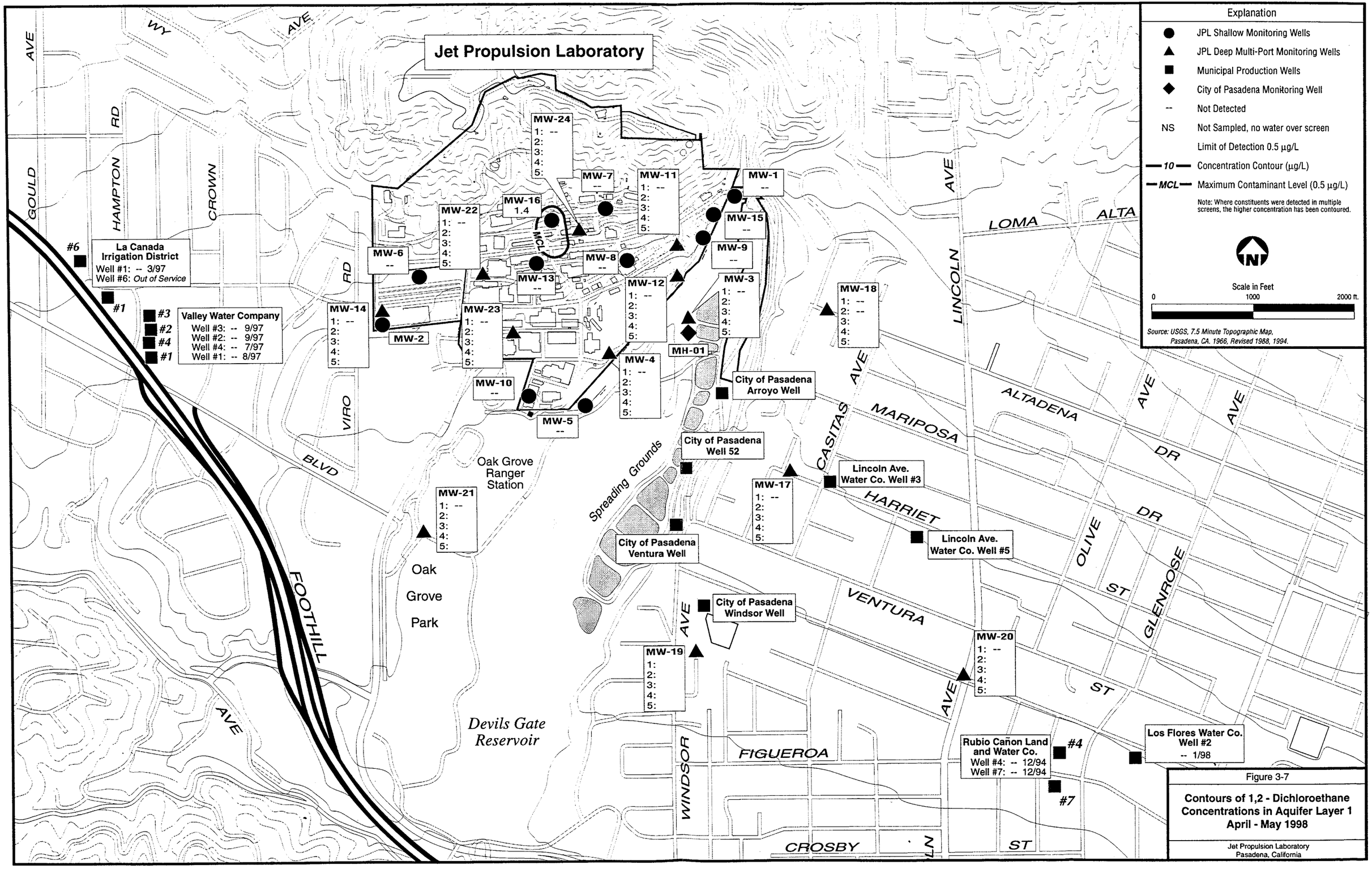


Figure 3-7

Contours of 1,2 - Dichloroethane Concentrations in Aquifer Layer 1 April - May 1998

Jet Propulsion Laboratory
Pasadena, California

Jet Propulsion Laboratory

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- -- Not Detected
- NS Not Sampled, no water over screen
- Limit of Detection 0.5 µg/L
- 10 Concentration Contour (µg/L)
- MCL Maximum Contaminant Level (5 µg/L)

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

Scale in Feet: 0 — 1000 — 2000 ft.

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

MW-24: 1: -- 2: 3: 4: 5:
MW-7: 0.5
MW-11: 1: -- 2: 3: 4: 5:
MW-1: --
MW-16: 0.8
MW-22: 1: 2.1 2: 3: 4: 5:
MW-15: --
MW-13: 0.5
MW-9: --
MW-6: 3.2
MW-8: --
MW-12: 1: -- 2: 3: 4: 5:
MW-3: 1: -- 2: 3: 4: 5:
MW-18: 1: -- 2: -- 3: 4: 5:
MW-14: 1: 1.2 2: 3: 4: 5:
MW-2
MW-23: 1: 0.8 2: 3: 4: 5:
MH-01
MW-4: 1: -- 2: 3: 4: 5:
MW-10: --
MW-5: --

#6 La Canada Irrigation District
Well #1: -- 9/97
Well #6: *Out of Service*

#1

#3 #2 #4 #1 Valley Water Company

Well #3:	1.0	9/97
Well #2:	9.1	9/97
Well #4:	22.6	7/97
Well #1:	38	7/97

City of Pasadena Arroyo Well

City of Pasadena Well 52

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

Lincoln Ave. Water Co. Well #3

Lincoln Ave. Water Co. Well #5

City of Pasadena Ventura Well

City of Pasadena Windsor Well

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

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

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

Oak Grove Ranger Station

Oak Grove Park

Devils Gate Reservoir

Spreading Grounds

Rubio Cañon Land and Water Co.
Well #4: -- 9/94
Well #7: -- 9/94

#4 #7

Los Flores Water Co. Well #2
4.8 1/98

0.5 ? 0.5 ?

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

Figure 3-8

Contours of Tetrachloroethene Concentrations in Aquifer Layer 1 April - May 1998

Jet Propulsion Laboratory
Pasadena, California

Jet Propulsion Laboratory

Explanation

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

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

Scale in Feet
0 1000 2000 ft.

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

MW-24
1:
2: 0.9
3: --
4:
5:

MW-7

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

MW-1

MW-16

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

MW-15

MW-13

MW-9

MW-6

MW-8

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

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

MW-18
1:
2:
3: 1.3
4:
5:

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

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

MW-2

MH-01

MW-4
1:
2: 0.7
3: --
4: --
5:

MW-10

MW-5

La Canada Irrigation District
Well #1: -- 9/97
Well #6: *Out of Service*

#6 #1

Valley Water Company
#3 Well #3: 1.0 9/97
#2 Well #2: 9.1 9/97
#4 Well #4: 22.6 7/97
#1 Well #1: 38 7/97

City of Pasadena Arroyo Well
-- 6/97

City of Pasadena Well 52
-- 11/97

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

Lincoln Ave. Water Co. Well #3
0.5 1/98

Lincoln Ave. Water Co. Well #5
0.7 6/97

MW-21
1:
2: 1.0
3: 1.1
4:
5:

City of Pasadena Ventura Well
-- 1/98

City of Pasadena Windsor Well
0.7 1/98

MW-19
1:
2: 1.2
3: 2.5
4:
5:

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

Rubio Cañon Land and Water Co.
Well #4: -- 12/94
Well #7: -- 12/94
#4 #7

Los Flores Water Co. Well #2
4.8 1/98
#2

0.5 ?

Oak Grove Ranger Station

Oak Grove Park

Devils Gate Reservoir

Spreading Grounds

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

Figure 3-9

Contours of Tetrachloroethene Concentrations in Aquifer Layer 2 April - May 1998

Jet Propulsion Laboratory
Pasadena, California

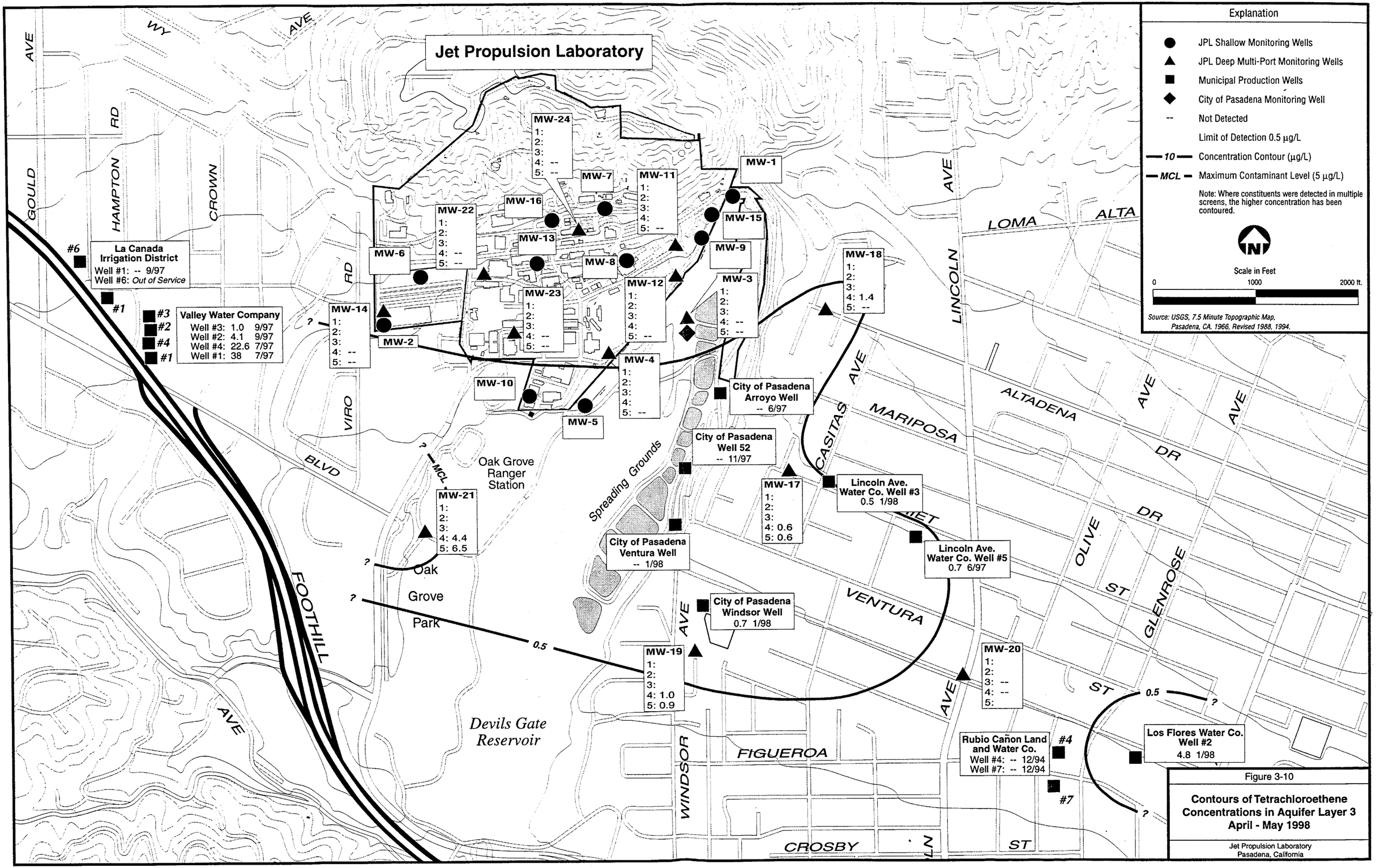


Figure 3-10

Contours of Tetrachloroethene Concentrations in Aquifer Layer 3 April - May 1998

Jet Propulsion Laboratory
Pasadena, California

Jet Propulsion Laboratory

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- -- Not Detected
- Not sampled, no water over screen
- Limit of Detection 4 µg/L
- 10 Concentration Contour (µg/L)
- IAL Interim Action Level (18 µg/L)

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

Scale in Feet
0 1000 2000 ft.

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

MW-24 1: 74 2: 3: 4: 5:
MW-7 130
MW-11 1: -- 2: 3: 4: 5:
MW-1 --
MW-22 1: 5.4 2: 3: 4: 5:
MW-16 640
MW-15 --
MW-6 --
MW-8 7.6
MW-9 --
MW-13 95
MW-12 1: -- 2: 3: 4: 5:
MW-3 1: -- 2: 3: 4: 5:
MW-18 1: -- 2: -- 3: 4: 5:
MW-14 1: 4.4 2: 3: 4: 5:
MW-2
MW-23 1: 16 2: 3: 4: 5:
MH-01
MW-4 1: -- 2: 3: 4: 5:
MW-10 --
MW-5 --
City of Pasadena Arroyo Well
City of Pasadena Well 52
MW-17 1: -- 2: 3: 4: 5:
Lincoln Ave. Water Co. Well #3
Lincoln Ave. Water Co. Well #5
City of Pasadena Ventura Well
City of Pasadena Windsor Well
MW-19 1: 2: 3: 4: 5:
MW-20 1: 5.5 2: 3: 4: 5:
MW-21 1: 14 2: 3: 4: 5:
Oak Grove Ranger Station
Oak Grove Park
Devils Gate Reservoir
Spreading Grounds
La Canada Irrigation District
Well #1: -- 3/97
Well #6: *Out of Service*
#6
#1
Valley Water Company
#3 Well #3: -- 9/97
#2 Well #2: --
#4 Well #4: --
#1 Well #1: -- 9/97
Rubio Cañon Land and Water Co.
Well #4: 3
Well #7: 4
#4
#7
Los Flores Water Co. Well #2
6

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

Figure 3-11

Contours of Perchlorate Concentrations in Aquifer Layer 1 April - May 1998

Jet Propulsion Laboratory
Pasadena, California

Jet Propulsion Laboratory

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- -- Not Detected
- Limit of Detection 4 µg/L
- 10 Concentration Contour (µg/L)
- IAL Interim Action Level (18 µg/L)

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

Scale in Feet
0 1000 2000 ft.

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

MW-24
1:
2: 480
3: --
4:
5:

MW-7

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

MW-1

MW-16

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

MW-15

MW-6

MW-9

MW-8

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

MW-13

MW-12
1:
2: 6.0
3: 6.9
4: 8.0
5:

MW-3
1:
2: --
3: 6.2
4:
5:

MW-14
1:
2: 4.0
3: 5.8
4:
5:

MW-23
1:
2: 7.5
3: --
4:
5:

MW-2

MH-01

MW-4
1:
2: 40
3: --
4: --
5:

MW-10

MW-5

City of Pasadena Arroyo Well
130 8/97

City of Pasadena Well 52
17

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

Lincoln Ave. Water Co. Well #3
--

Lincoln Ave. Water Co. Well #5
--

City of Pasadena Ventura Well
2

City of Pasadena Windsor Well
--

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

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

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

La Canada Irrigation District
Well #1: --
Well #6: *Out of Service*

Valley Water Company
Well #3: -- 9/97
Well #2: --
Well #4: --
Well #1: -- 9/97

Rubio Cañon Land and Water Co.
Well #4: 3
Well #7: 4 9/97

Los Flores Water Co. Well #2
6

Oak Grove Ranger Station

Oak Grove Park

Devils Gate Reservoir

Spreading Grounds

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

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

100 IAL

? 4 ? ? 4

Figure 3-12

Contours of Perchlorate Concentrations in Aquifer Layer 2 April - May 1998

Jet Propulsion Laboratory
Pasadena, California

Jet Propulsion Laboratory

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- -- Not Detected
- Limit of Detection 4 µg/L
- 10 — Concentration Contour (µg/L)
- IAL — Action Level (18 µg/L)

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

Scale in Feet
0 1000 2000 ft.

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

MW-24 1: 2: 3: 4: -- 5: --
MW-7
MW-11 1: 2: 3: 4: -- 5: --
MW-1
MW-16
MW-22 1: 2: 3: 4: -- 5: --
MW-15
MW-6
MW-8
MW-9
MW-18 1: 2: 3: 4: 5.0 5: 13
MW-13
MW-12 1: 2: 3: 4: 5: --
MW-3 1: 2: 3: 4: -- 5: --
MW-14 1: 2: 3: 4: -- 5: --
MW-23 1: 2: 3: 4: -- 5: --
MW-2
MH-01
MW-4 1: 2: 3: 4: 5: --
MW-10
MW-5
MW-21 1: 2: 3: 4: -- 5: 5.8
MW-17 1: 2: 3: 4: 17 5: 15
MW-19 1: 2: 3: 4: -- 5: --
MW-20 1: 2: 3: -- 4: -- 5:

La Canada Irrigation District
Well #1: --
Well #6: *Out of Service*

Valley Water Company
Well #3: -- 9/97
Well #2: --
Well #4: --
Well #1: -- 9/97

City of Pasadena Arroyo Well
130 8/97

City of Pasadena Well 52
17

City of Pasadena Ventura Well
2

City of Pasadena Windsor Well
--

Lincoln Ave. Water Co. Well #3
--

Lincoln Ave. Water Co. Well #5
--

Rubio Cañon Land and Water Co.
Well #4: 3
Well #7: 4 9/97

Los Flores Water Co. Well #2
6

Oak Grove Ranger Station

Oak Grove Park

Devils Gate Reservoir

Spreading Grounds

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

Figure 3-13

Contours of Perchlorate Concentrations in Aquifer Layer 3 April - May 1998

Jet Propulsion Laboratory
Pasadena, California

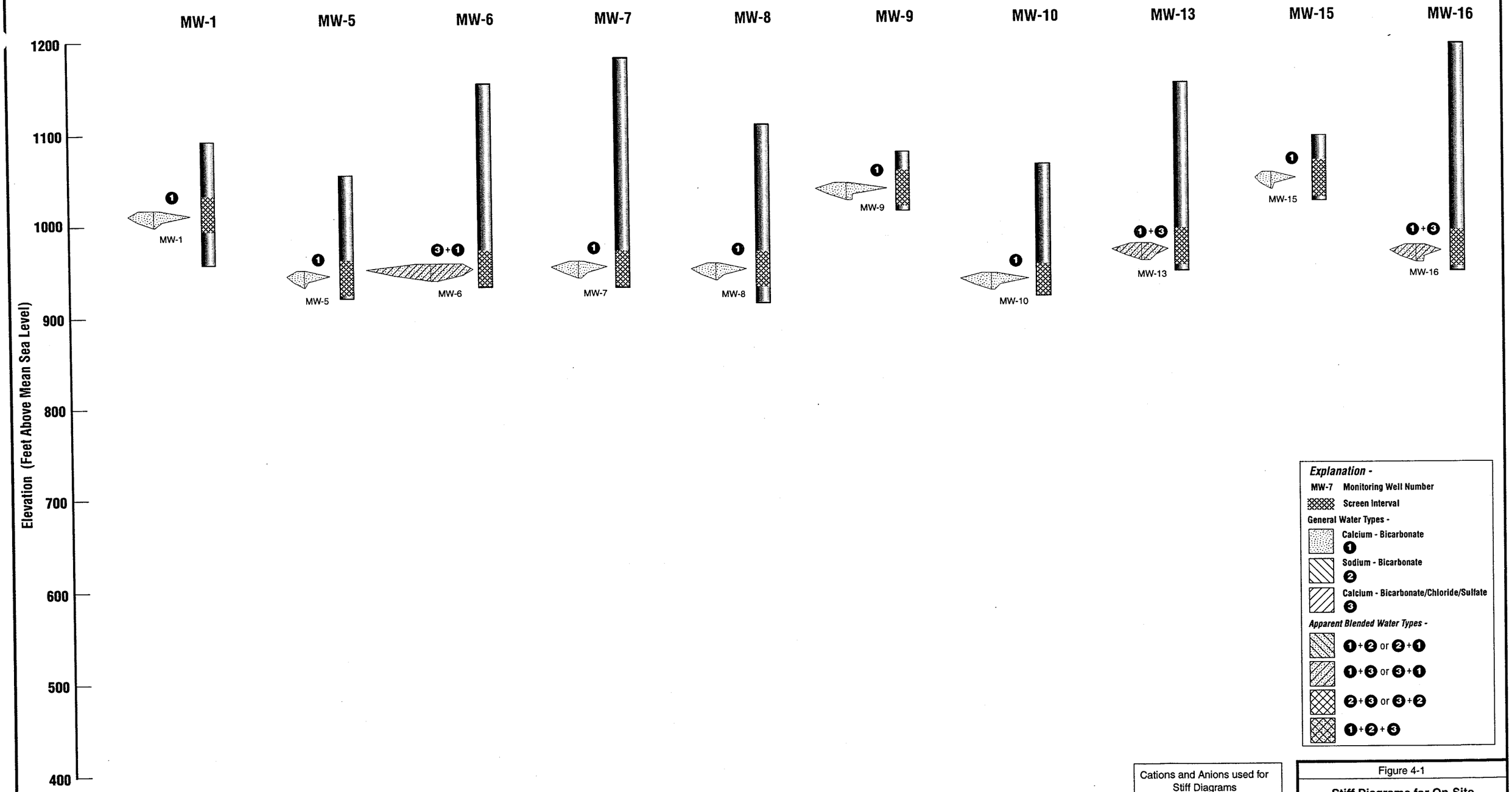
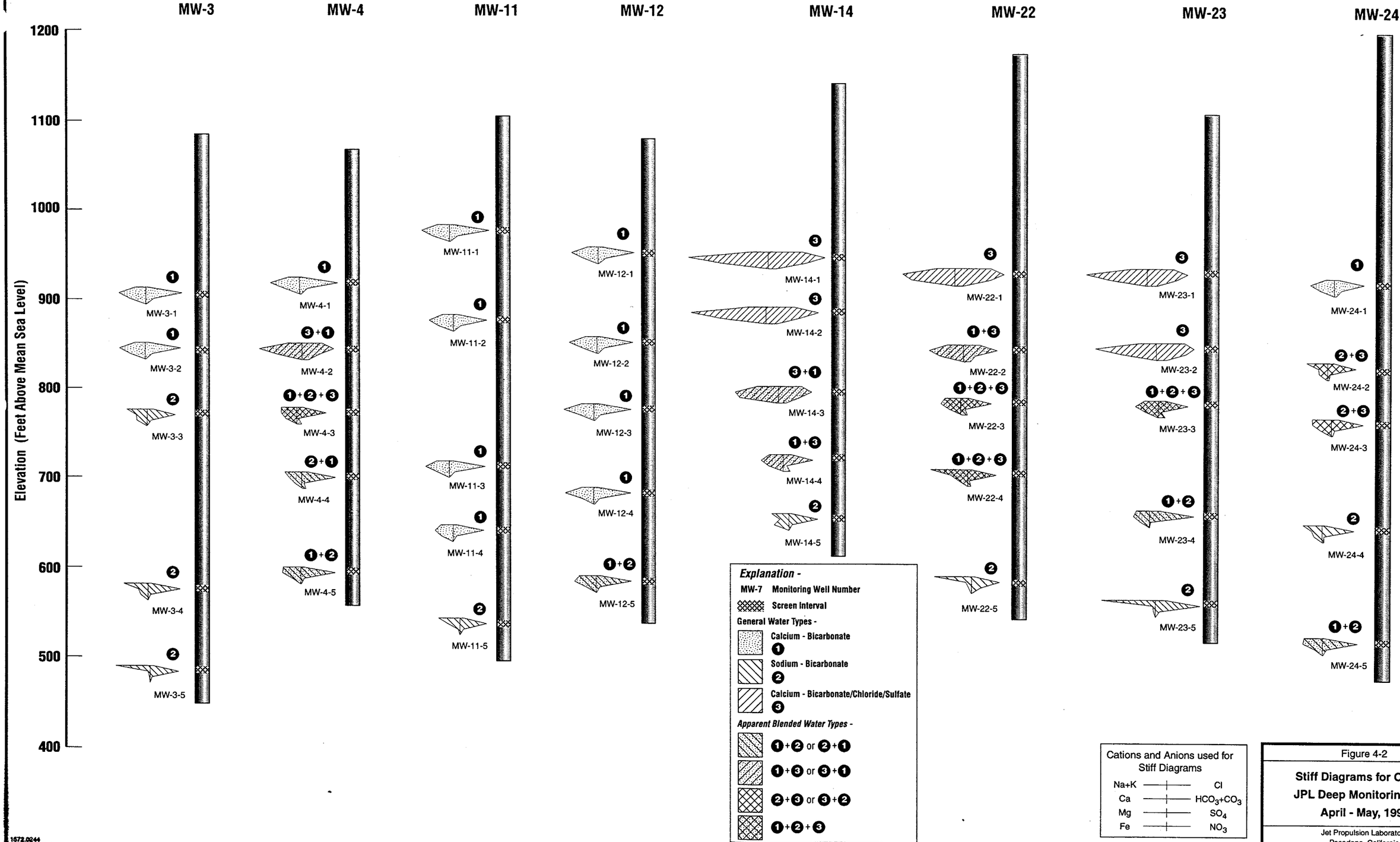


Figure 4-1

Stiff Diagrams for On-Site JPL Shallow Monitoring Wells April - May, 1998

Jet Propulsion Laboratory
Pasadena, California

1572.0244



1572.0244

Figure 4-2

Stiff Diagrams for On-Site JPL Deep Monitoring Wells
April - May, 1998

Jet Propulsion Laboratory
Pasadena, California

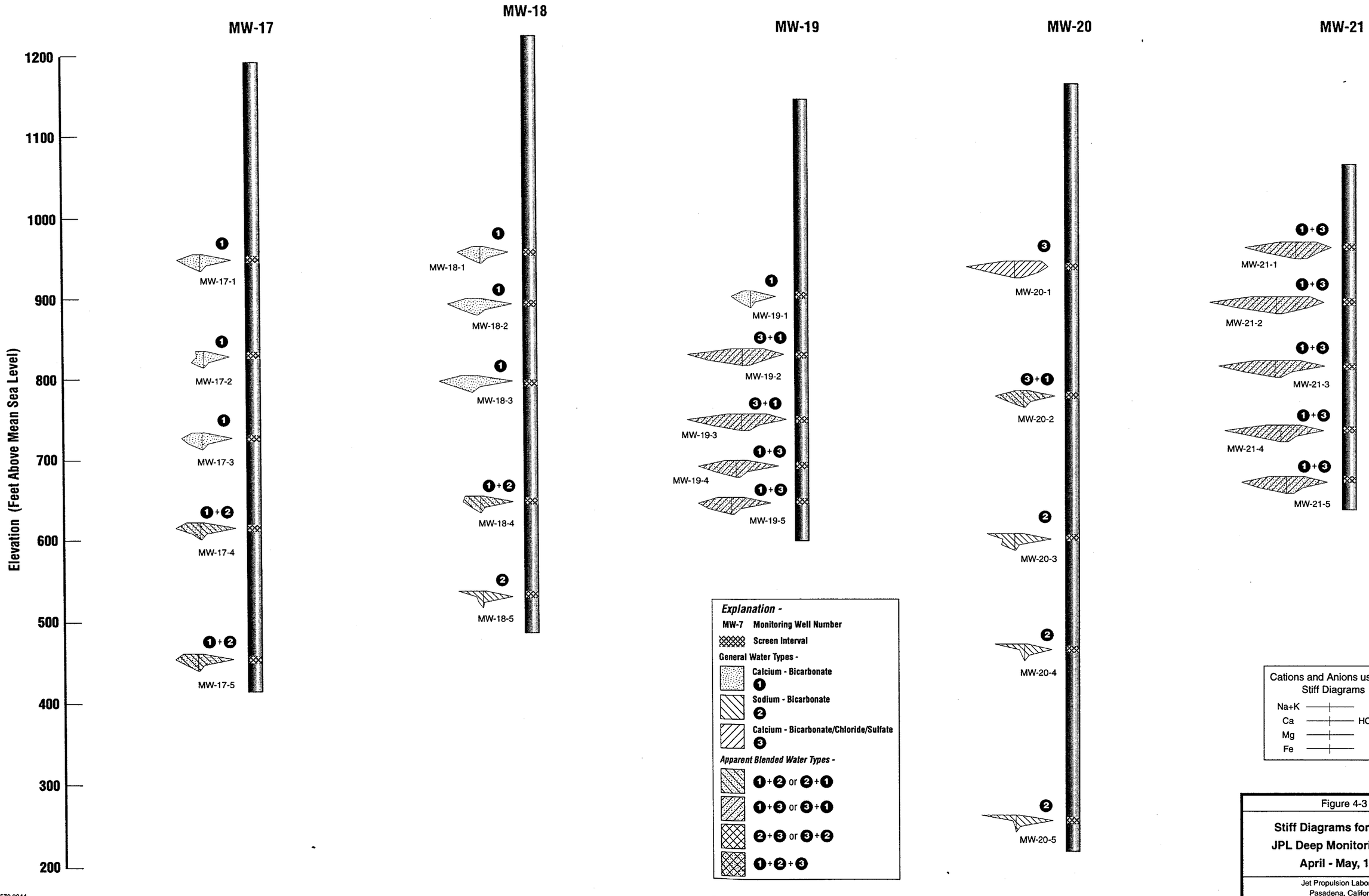


Figure 4-3

Stiff Diagrams for Off-Site JPL Deep Monitoring Wells April - May, 1998

Jet Propulsion Laboratory
Pasadena, California

1572.0244

Jet Propulsion Laboratory

MW-24 1012.70
MW-7 1011.99
MW-1 1094.06
MW-16 1010.99
MW-15 1091.75
MW-11 1032.05
MW-6 1012.80
MW-13 1011.79
MW-9 1086.90
MW-8 1015.04
MW-14 1012.80
MW-22 1010.42
MW-12 1022.34
MW-3 1007.19
MW-18 981.98
MW-23 1012.77
MW-2
MW-4 1020.00
MH-01
MW-10 1016.76
MW-5 1022.76
MW-17 1008.00
MW-21 1016.42
MW-19 1000.12
MW-20 960.11

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

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

Oak Grove Ranger Station
Spreading Grounds
Potential Mound due to Ponded Water
Oak Grove Park
Devils Gate Reservoir

1090 1070 1050 1030 1020 1015 1010 1005 1000 995 990
1020 1010 1015 1020 1000 1005 1010 1015
1005 1005 1000 995 990 985 980 975 970 965 960

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

Explanation

- JPL Shallow Monitoring Wells
- JPL Deep Multi-Port Monitoring Wells
- Municipal Production Wells
- City of Pasadena Monitoring Well
- ND — No Data; Top screen dry. Second screen significantly affected by nearby pumping
- Direction of groundwater flow

Note: Contours Represent Feet Above Mean Sea Level

N

Scale in Feet
0 1000 2000 ft.

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

Figure 5-1

Water-Table Elevation Contour Map
April 17, 1998

Jet Propulsion Laboratory
Pasadena, California

Jet Propulsion Laboratory

MW-24 1018.00
MW-7 1018.00
MW-1 1094.72
MW-16 1016.51
MW-15 1092.57
MW-11 1036.62
MW-6 1013.71
MW-13 1016.81
MW-8 1020.41
MW-9 1087.52
MW-14 1013.83
MW-22 1014.53
MW-23 1016.23
MW-12 1025.97
MW-3 1010.44
MW-18 991.43
MW-2
MW-4 1023.41
MH-01
MW-10 1019.12
MW-5 1025.01
MW-17 1014.99
MW-21 1014.96
MW-19 1002.35
MW-20 966.00

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

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

1090 1070 1050 1040 1030 1020 1015 1010 1005 1000 995 990 1020 1015 1010 1005 1000 1005 1000 995 990 985 980 975 970 965 1015 1010 1005 1015

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

Explanation

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

Note: Contours Represent Feet Above Mean Sea Level

N

Scale in Feet
0 1000 2000 ft.

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

Figure 5-2

Water-Table Elevation Contour Map
May 18, 1998

Jet Propulsion Laboratory
Pasadena, California

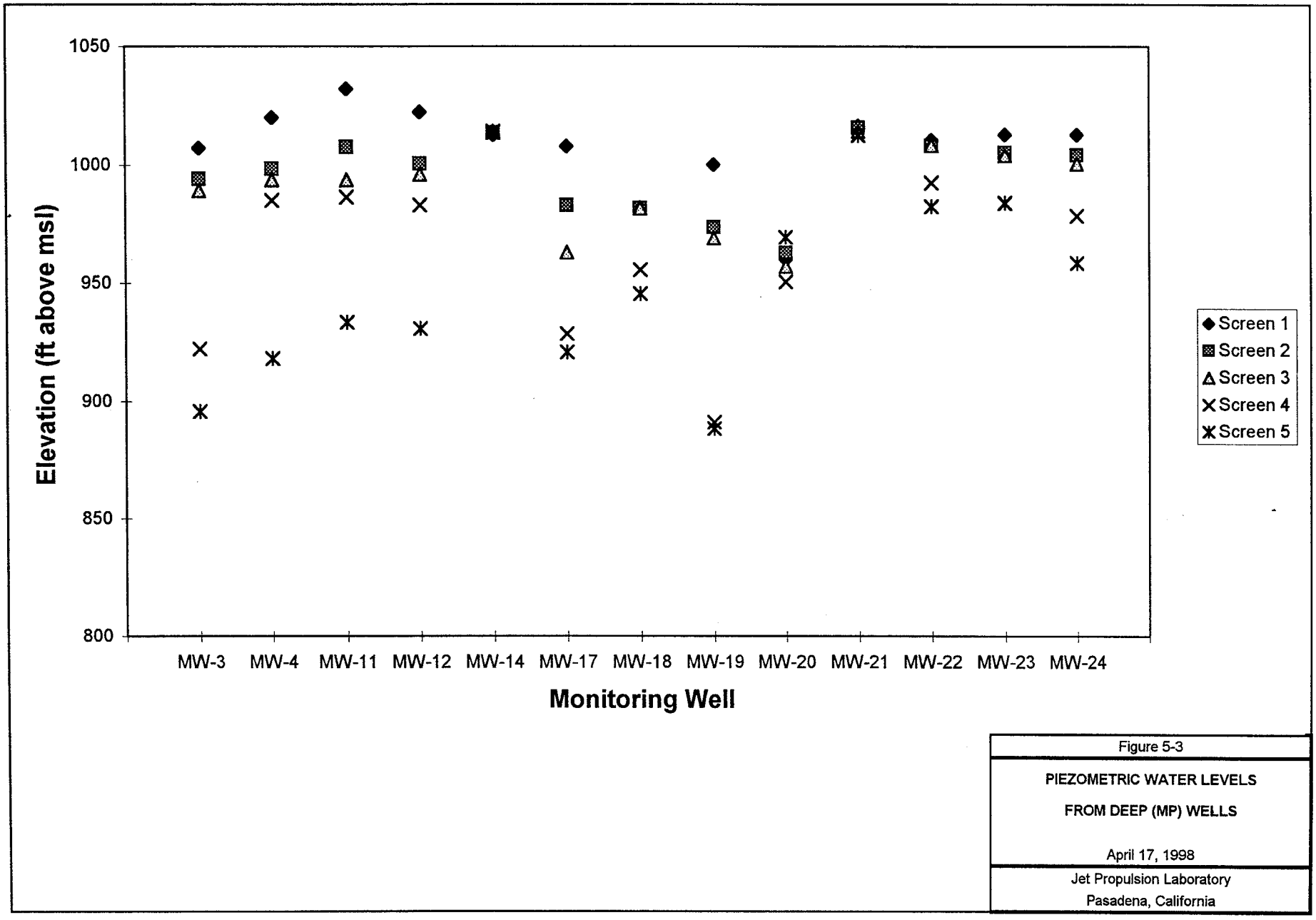


Figure 5-3

PIEZOMETRIC WATER LEVELS

FROM DEEP (MP) WELLS

April 17, 1998

Jet Propulsion Laboratory
Pasadena, California

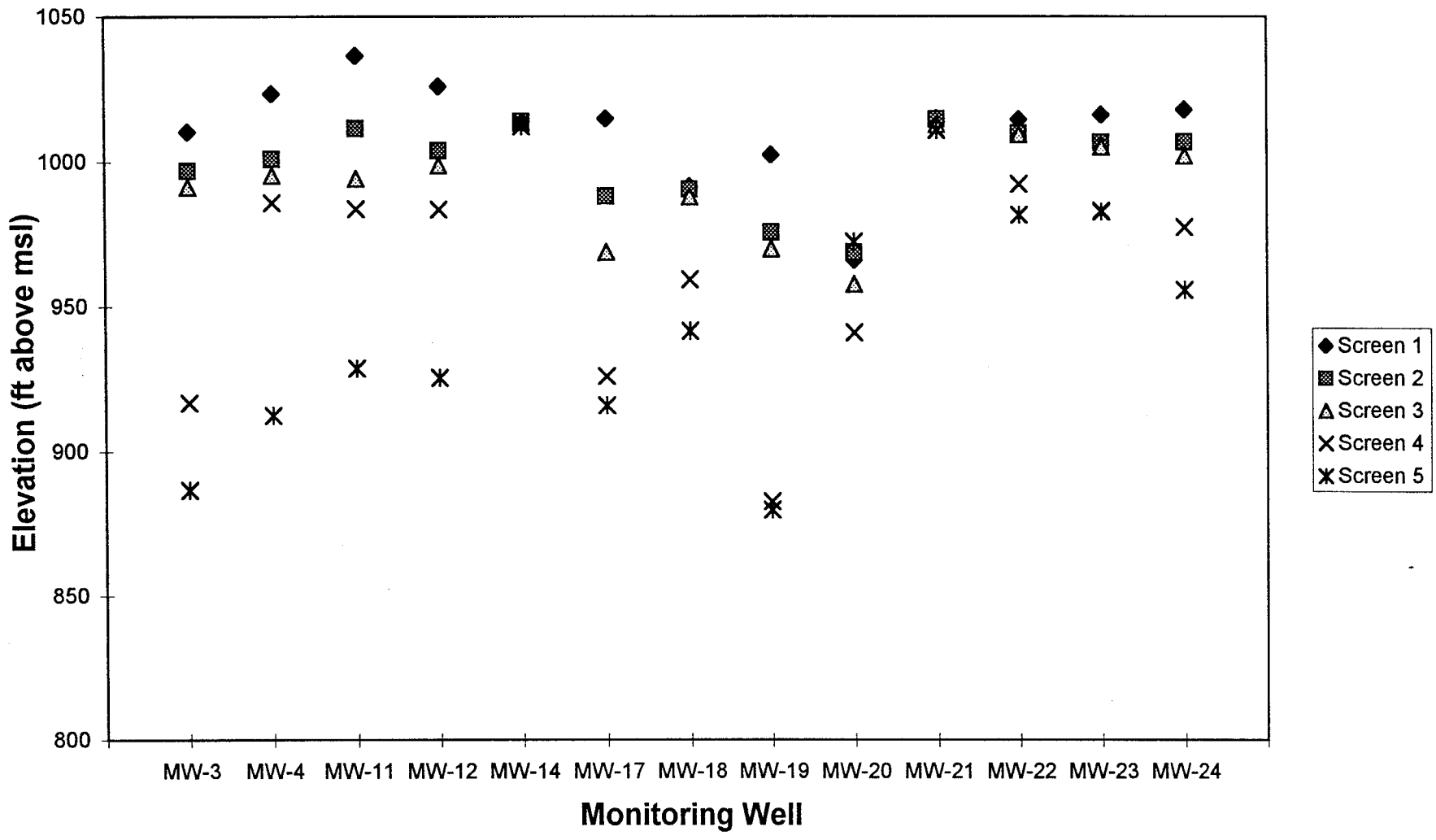


Figure 5-4

PIEZOMETRIC WATER LEVELS

FROM DEEP (MP) WELLS

May 18, 1998

Jet Propulsion Laboratory

Pasadena, California

APPENDIX A

WELL DEVELOPMENT/WELL SAMPLING LOG FORMS FOR SHALLOW WELLS

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPC
Project Number : 1572.0244
Date : 5/15/95
Site Engineer : T. BLANEY, J. BIENIEK

Well Number : MW-1
Equipment : 2" GRUNDFOS PUMP
HORIBA U-10, DIRECT READ
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	20.75	TOP OF 4" CASING	20.75
Depth to Sediment (ft)	119.25	TOP OF 4" CASING	119.75
Thickness of Sediment (ft)	6.75		0.75

Depth of Well (ft) 120
Diameter of Casing (ft) 0.33
Water Column Height (ft) 98.50
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 64.1
Casing Volumes Purged 1.25
Total Volume Purged (gals) 80.0

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0934	8.52	2.35	16.6	446	2.5	PUMP ON; CONTROL BOX SET AT 250 Hz
0940	7.65	4.69	15.7	484	2.5	WATER CLEAR
0945	7.36	6.72	16.5	481	2.5	WATER CLEAR
0950	7.32	1.73	16.8	478	2.5	WATER CLEAR
0955	7.33	0.92	16.9	481	2.5	WATER CLEAR
1000	7.28	0.69	16.9	481	2.5	WATER CLEAR
1003	7.27	0.59	16.9	479	2.5	WATER CLEAR
1006	7.27	0.45	16.8	480	2.5	READY TO SAMPLE
1010	—	—	—	—	0.02	FLOW REDUCED; COLLECT MW-982-001
1015	—	—	—	—	—	PUMP OFF @ MW-1

Notes Sampling Procedures: PUMP SET AT 46' BTOC

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0244
Date : 5/5/98
Site Engineer : T. BLANEY, J. BRENNER

Well Number : MW-5
Equipment : 2" GRUNDFOS PUMP, HORIBA U-10, DRUM SIZE
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	46.60	TOP OF 4" CASING	46.60
Depth to Sediment (ft)	133.95	TOP OF 4" CASING	133.95
Thickness of Sediment (ft)	6.05		6.05

Depth of Well (ft) 140
Diameter of Casing (ft) 0.33
Water Column Height (ft) 87.35
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 56.8
Casing Volumes Purged 2.32
Total Volume Purged (gals) 131.6

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1305	7.04	>200	19.6	309	2.35	PUMP ON, CONTROL
						BOX SET AT 225 Hz
1310	6.71	7200	19.3	312	2.35	WATER REDDISH-ORANGE (CLOUDY)
1315	6.65	97.5	18.8	308	2.35	WATER CLOUDY
1320	6.64	53.5	19.0	306	2.35	WATER CLOUDY
1325	6.62	39.9	18.9	306	2.35	Water sl. cloudy
1330	6.60	27.1	18.8	306	2.35	Water sl. cloudy
1335	6.61	21.7	19.2	304	2.35	Water sl. cloudy
1340	6.57	16.4	19.2	306	2.35	WATER CLEARING
1345	6.55	10.4	19.2	304	2.35	WATER CLEARING
1350	6.54	8.62	19.3	306	2.35	WATER CLEARING
1355	6.53	4.83	19.4	306	2.35	WATER CLEAR
1358	6.56	3.96	19.5	307	2.35	
1401	6.53	3.13	19.7	308	2.35	READY TO SAMPLE
1405	—	—	—	—	0.02	REDUCE FLOW, COLLECT
						MW-982-013
1410	—	—	—	—	—	PUMP OFF AT MW-5

Notes Sampling Procedures: PUMP SET AT 50' TOC

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0244
Date : 5/14/98
Site Engineer : T. BLANEY, J. BRENNER

Well Number : MW-6
Equipment : 2" GRUNDFOS PUMP
HORIBA U-10, DIST-1SC
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	175.04	TOP OF 4" CASING	175.04
Depth to Sediment (ft)	239.90	TOP OF 4" CASING	238.8
Thickness of Sediment (ft)	~~245~~ 6.2		6.2

Depth of Well (ft) 245
Diameter of Casing (ft) 0.333
Water Column Height (ft) 63.76

Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 41.5
Casing Volumes Purged 2.02

Total Volume Purged (gals) 83.79

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1300	—	—	—	—	1.71	START pumping @ MW-6. Set Control Box @ 380 Hz.
1310	6.23	27.9	21.7	1110	1.71	water sl. cloudy
1320	6.18	27.0	21.5	1120	1.71	water sl. cloudy
1325	6.16	22.1	21.5	1130	1.71	water sl. cloudy
1330	6.19	10.1	21.4	1100	1.71	water sl. clear
1335	6.19	4.4	21.3	1090	1.71	water v. clear
1340	6.20	2.5	21.5	1090	1.71	water v. clear
1343	6.19	2.1	21.6	1090	1.71	water v. clear
1346	6.19	2.1	21.5	1090	1.71	water v. clear
1349	—	—	—	—	0.02	Reduce flow for VOCs
1350	—	—	—	—	0.02	Sample MW-982-0514
1355	—	—	—	—	—	Pump OFF

Notes Sampling Procedures:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 15720244
Date : 5/13/98
Site Engineer : T. Blaney

Well Number : MW-7
Equipment : Horiba U-10
DGT-15CE
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	195.70	TOC	195.70
Depth to Sediment (ft)	269.85	TOC	269.85
Thickness of Sediment (ft)	5.15		5.15

Depth of Well (ft) 275
Diameter of Casing (ft) 0.333
Water Column Height (ft) 74.85
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 48.73
Casing Volumes Purged 2.15
Total Volume Purged (gals) 104.9

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0830	—	—	—	—	2.28	START Pumping @ MW-7
						Control Box @ 360 Hz
0835	6.33	45.5	18.2	467	2.28	Water sl. cloudy; Reddish
0845	7.03	16.2	19.0	447	2.28	Water sl. cloudy; Reddish Tint
0855	7.05	10.8	19.0	449	2.28	Water sl. clear; NO TINT
0900	7.03	8.1	19.1	443	2.28	Water clear; NO TINT
0905	7.02	4.8	18.9	439	2.28	Water v. clear
0910	7.02	4.3	19.0	441	2.28	Water v. clear
0913	7.02	4.2	19.0	442	2.28	Water v. clear
0916	7.01	4.1	19.0	441	2.28	Water v. clear; Ready to Sample
0919	—	—	—	—	0.02	Reduce Flow For VOCs
0920	—	—	—	—	0.02	Sample MW-982-015
0920	—	—	—	—	0.02	Sample MW-982-015 MS
0920	—	—	—	—	0.02	Sample MW-982-015 MSD
0935	—	—	—	—	—	STOP Pumping @ MW-7.
0940	—	—	—	—	—	Sample MW-982-200 (field BLANK)

Notes Sampling Procedures: Set pump @ 199' BTOC

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0244
Date : 5/14/98
Site Engineer : T. BLANEY, J. BRENNER
Well Number : MW-8
Equipment : 2" GRUNDFOS PUMP, HORIBA U-10 & DRT-15CE
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	119.82	TOP OF 4" CASING	119.82
Depth to Sediment (ft)	202.40	TOP OF 4" CASING	202.40
Thickness of Sediment (ft)	2.6		2.6

Depth of Well (ft) 205
Diameter of Casing (ft) 0.333
Water Column Height (ft) 82.58
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 53.75
Casing Volumes Purged 1.19
Total Volume Purged (gals) 63.72

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1005					1.77	START Pumping @ MW-8
						Control Box set @ 275 Hz.
1010	6.52	1.8	18.1	405	1.77	Water V. clear
1020	6.42	2.9	18.4	406	1.77	Water V. clear
1030	6.40	2.5	18.4	407	1.77	Water V. clear
1035	6.39	2.7	18.3	405	1.77	Water V. clear
1038	6.42	2.6	18.3	406	1.77	Water V. clear
1041	6.41	2.6	18.4	407	1.77	Water V. clear
1044	—	—	—	—	0.02	Reduce Flow For VOCs
1045	—	—	—	—	0.02	Sample MW-98Z-016
1050	—	—	—	—	—	STOP Pumping @ MW-8

Notes Sampling Procedures: Set Pump @ 123' BTOC

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPC
Project Number : 1572.0244
Date : 5/15/95
Site Engineer : T. BLANEY, J. BRENNER
Well Number : MW-9
Equipment : 2" GRUNFOS PUMP, HORIBA U-10, DRT-ISE
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	18.12	TOP OF 4" CASING	18.12
Depth to Sediment (ft)	69.69	TOP OF 4" CASING	69.69
Thickness of Sediment (ft)	0.31		0.31

Depth of Well (ft): 70
Diameter of Casing (ft): 0.333
Water Column Height (ft): 51.57
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 33.5
Casing Volumes Purged: 2.31
Total Volume Purged (gals): 77.5

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0825	6.43	9.20	15.5	494	2.5	PUMP ON; CONTROL BOX SET AT 250 Hz
0830	6.72	9.92	17.3	509	2.5	WATER SL. CLOUDY
0835	6.79	5.51	17.3	511	2.5	WATER CLEAR
0840	6.82	3.41	17.6	506	2.5	WATER CLEAR
0845	6.83	3.25	17.9	512	2.5	WATER CLEAR
0850	6.86	1.89	17.8	511	2.5	WATER CLEAR
0853	6.85	1.73	17.8	509	2.5	WATER CLEAR
0856	6.93	1.33	17.9	512	2.5	READY TO SAMPLE
0900	-	-	-	-	0.02	FLOW REDUCED; COLLECT MW-9S2-017
0905	-	-	-	-	-	PUMP OFF @ MW-9

Notes Sampling Procedures: PUMP SET AT 21' BTOC

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0244
Date : 5/14/99
Site Engineer : T. BLANEY, J. BRENNER

Well Number : MW-10
Equipment : 2" GRUNFOS PUMP
HORIBA U-10 DRT-15CE
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	68.99	TOP OF 4" CAS, NG	68.99
Depth to Sediment (ft)	148.80	TOP OF 4" CAS, NG	148.80
Thickness of Sediment (ft)	~~155~~ 6.2		6.2

Depth of Well (ft) 155
Diameter of Casing (ft) 0.333
Water Column Height (ft) 79.81
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 51.9
Casing Volumes Purged 1.14
Total Volume Purged (gals) 59.21

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1115					1.91	START Pumping @ MW-10
						Set Control Box @ 220 Hz
1120	6.28	3.9	19.4	491	1.91	Water V. Clear
1125	6.24	3.3	19.4	491	1.91	Water V. Clear
1130	6.22	3.2	19.7	491	1.91	Water V. Clear
1135	6.22	2.9	19.8	492	1.91	Water V. Clear
1140	6.21	2.7	19.9	493	1.91	Water V. Clear
1143	6.22	2.7	19.9	494	1.91	Water V. Clear
1146	6.22	2.6	19.9	493	1.91	Water V. Clear
1149	—	—	—	—	0.02	Reduce Flow for VOC's
1150	—	—	—	—	0.02	Sample MW-982-018
1230	—	—	—	—	0.02	Sample MW-982-019 (dup).
1200	—	—	—	—	—	STOP Pumping @ MW-10

Notes Sampling Procedures:

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPC
Project Number : 1572.0244
Date : 5/13/98
Site Engineer : T. BLANEY, J. BRENNER

Well Number : MW-13
Equipment : 2" GRUNDFOS PUMP
HDZ, 3A-U16; DAT-15LE
Contractor :

	Before	Reference Point	After
Depth to Water (ft)	167.34	TOP OF 4" CASING	167.34
Depth to Sediment (ft)	234.90	TOP OF 4" CASING	234.90
Thickness of Sediment (ft)	0.10		0.1

Depth of Well (ft) 235
Diameter of Casing (ft) 0.333
Water Column Height (ft) 67.56

Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 43.9
Casing Volumes Purged 1.64

Total Volume Purged (gals) 72

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1020	—	—	—	—	2.00	START Pumping @ MW-13
						Set Control Box @ 325 Hz
1030	6.70	10.4	20.2	541	2.00	Water Clear
1040	6.62	3.6	20.9	540	2.00	Water V. clear
1050	6.62	3.4	~~20.8~~ 20.8	541	2.00	Water V. clear
1053	6.65	3.5	20.9	544	2.00	Water V. clear
1056	6.63	3.5	20.8	542	2.00	Water V. clear
1059	—	—	—	—	0.02	Reduce Flow For VOCs
1100	—	—	—	—	0.02	Sample MW-982-031
1130	—	—	—	—	0.02	Sample MW-982-032
1110						STOP Pumping @ MW-13

Notes Sampling Procedures: Set Pump @ 170' BTOC

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0244
Date : 5/15/98
Site Engineer : T. BLANEY, J. BRENNER

Well Number : MW-15
Equipment : 2" GRUNDFOS PUMP, HORIBA U-10, DRT-15CE
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	27.79	TOP OF 4" CASING	27.79
Depth to Sediment (ft)	75.00	TOP OF 4" CASING	75.00
Thickness of Sediment (ft)	0.0		0.0

Depth of Well (ft) 75.00
Diameter of Casing (ft) 0.33
Water Column Height (ft) 47.21
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 30.7
Casing Volumes Purged 1.82
Total Volume Purged (gals) 55.9

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1035	6.79	8.38	20.6	267	2.15	PUMP ON; CONTROL
						BOX SET AT 210 Hz
1040	6.65	8.81	19.1	271	2.15	WATER CLEAR
1045	6.82	3.54	18.6	284	2.15	WATER CLEAR
1050	6.85	0.69	18.4	289	2.15	WATER CLEAR
1055	6.88	0.38	18.5	290	2.15	WATER CLEAR
1058	6.89	0.38	18.4	289	2.15	WATER CLEAR
1101	6.89	0.41	18.5	290	2.15	READY TO SAMPLE
~~1103~~						
1105	—	—	—	—	0.02	REDUCE FLOW; COLLECT
						MW-902-038
1110	—	—	—	—	—	PUMP OFF @ MW-15

Notes Sampling Procedures: PUMP SET AT 30' BTOC

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : LPC
Project Number : 1572.0244
Date : 5/17/94
Site Engineer : T. BLANEY / J. BRENNER

Well Number : MW-16
Equipment : 2" GRUNDFOS PUMP
HORIBA U-10? DI2-15E
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	220.47	TOP OF 4" CASING	220.47
Depth to Sediment (ft)	285.00	TOP OF 4" CASING	285.00
Thickness of Sediment (ft)	0		0

Depth of Well (ft) 285.00
Diameter of Casing (ft) 0.333
Water Column Height (ft) 65.53

Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 42.0
Casing Volumes Purged 1.32

Total Volume Purged (gals) 55.59

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0815	5.29	11.25	21.0	494	2.19	START PUMPING @ MW-16
						CONTROL BOX SET @ 380 Hz
0820	6.35	6.07	20.9	4.82	1.44	REDUCE Hz TO 350. WIRE
						PUMPING TO HAND ON FORMATION
0825	6.57	4.09	20.8	4.89	1.44	WATER CLEAR
0830	6.58	2.30	21.6	493	1.44	WATER CLEAR
0835	6.60	1.97	21.3	493	1.44	WATER CLEAR
0840	6.61	1.55	21.8	489	1.44	WATER CLEAR
0845	6.58	1.27	21.7	489	1.44	WATER CLEAR
0848	6.62	1.38	21.5	488	1.44	WATER CLEAR
0851	6.62	1.35	21.4	489	1.44	READY TO SAMPLE
0855	—	—	—	—	0.02	FLOW REDUCED. COLLECT
						MW-982-039
0905	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: Set pump @ 224' BTOC

F4

APPENDIX B

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

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0244
Date : 4/29/98
Site Engineer : J. BRENNER, D. DIRICK

Well Number : MW-3
Equipment : HORIBA U-10
DRT-ISCE
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE 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	9.00	1.98	19.9	303	N/A	1ST RUN TO SCREEN # 5; INITIAL PARAMETERS
0930	—	—	—	—	—	COLLECT MW-982-006
0950	8.81	1.50	21.6	242	N/A	3RD RUN TO SCREEN #5; FINAL PARAMETERS
1020	8.09	3.56	22.0	270	N/A	1ST RUN TO SCREEN #4; INITIAL PARAMETERS
1030	—	—	—	—	—	COLLECT MW-982-005
1110	8.11	2.65	23.9	323	N/A	3RD RUN TO SCREEN #4, FINAL PARAMETERS
1133	8.35	10.75	22.6	331	N/A	1ST RUN TO SCREEN # 3; INITIAL PARAMETERS
1155	8.36	4.71	22.9	341	—	COLLECT MW-982-004
1215	8.31		23.7	342	N/A	3RD RUN TO SCREEN #3; FINAL PARAMETERS
1238	7.60	4.30	22.5	404	N/A	1ST RUN TO SCREEN #2; INITIAL PARAMETERS
1255	—	—	—	—	—	COLLECT MW-982-003
1315	7.42	6.21	23.8	411	N/A	3RD RUN TO SCREEN #2 FINAL PARAMETERS
1330	7.76	4.77	23.3	434	N/A	1ST RUN TO SCREEN #1; INITIAL PARAMETERS
1400	—	—	—	—	—	COLLECT MW-982-002 MS/MSD VOCS & METALS
1430	7.12	4.23	22.6	423	N/A	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 : 1572.6244
Date : 5-7-98
Site Engineer : J. BRENNER & D. DIRKIN
Well Number : MW-4
Equipment : HORIBA U-10
DRT-15C
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
1210	7.84	3.78	20.2	344	N/A	1ST RUN, INITIAL PARAMETERS @ SCREEN #5
1230	—	—	—	—	—	COLLECT SAMPLE MW-982-012
1310	7.72	3.82	20.2	360	N/A	2nd RUN, final parameters AT SCREEN #5
1330	8.12	2.04	20.1	345	N/A	1ST RUN TO SCREEN #4 INITIAL PARAMETERS
1340	—	—	—	—	N/A	COLLECT SAMPLE MW-982-011
1410	8.06	2.62	19.8	350	N/A	3rd RUN, FINAL PARAMETERS
1435	8.16	3.15	19.5	360	N/A	1ST RUN, INITIAL PARAMETERS SCREEN #3
1450	—	—	—	—	—	COLLECT MW-982-010
1505	8.13	2.02	19.4	365	N/A	3rd RUN - FINAL PARAMETERS
1525	7.15	3.71	18.9	442	N/A	1ST RUN, INITIAL PARAMETERS
1545	—	—	—	—	—	COLLECT ~~MW-982~~ 007
1600	6.83	3.07	17.2	450	N/A	3RD RUN TO SCREEN #1

Notes Sampling Procedures:

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 15720244
Date : 5/12/98
Site Engineer : T. BLANEY
Well Number : MW-4
Equipment : HORIBA U-10
DRT-15CE
Contractor : N/A

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0812	6.55	1.77	16.1	740	—	1ST Run; Screen #2; Initial Parameters
0830					—	Sample MW-982-008
0945					—	Sample MW-982-009
1000	6.67	4.1	17.3	718	—	Finish @ MW-4 Screen # 2

Notes Sampling Procedures: _____

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0244
Date : 4/30/98
Site Engineer : J.BRENNER, D.DIRKIN

Well Number : MW-11
Equipment : HORIBA U-10
DRT-15C
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
0940	6.96	4.15	20.0	426	N/A	1ST RUN TO SCREEN #4; INITIAL PARAMETERS
0955	—	—	—	—	—	COLLECT MW-982-023
1020	8.14	4.20	20.8	342	N/A	2ND RUN TO SCREEN #4; FINAL PARAMETERS
1053	8.27	1.67	20.5	299	N/A	1ST RUN TO SCREEN # 5; INITIAL PARAMETERS
1120	—	—	—	—	—	COLLECT MW-982-024
1155	8.01	1.33	21.2	315	N/A	3RD RUN TO SCREEN #5; FINAL PARAMETERS
1225	7.98	2.06	21.2	386	N/A	1ST RUN TO SCREEN # 3, INITIAL PARAMETERS
1240	—	—	—	—	—	COLLECT MW-982-022
1300	7.95	1.07	21.4	350	N/A	3RD RUN TO SCREEN #3 FINAL PARAMETERS
1325	7.95	1.44	21.1	406	N/A	1ST RUN TO SCREEN #2; INITIAL PARAMETERS
1335	—	—	—	—	—	COLLECT MW-982-021
1350	7.77	1.96	21.7	412	N/A	3RD RUN TO SCREEN #2; FINAL PARAMETERS
1415	7.50	1.06	21.8	474	N/A	1ST RUN TO SCREEN #1; INITIAL PARAMETERS
1425	—	—	—	—	—	COLLECT MW-982-020
1440	7.66	1.74	20.9	504	N/A	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 : 1572.0244
Date : 5-1-98
Site Engineer : D. Dirkin & J. Brewster

Well Number : MW-12
Equipment : Horiba U-10
Dret-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
0950	7.79	3.48	18.5	402	N/A	1ST run to screen 5, initial parameters
1005	—	—	—	—	—	Collect MW-982-030
1051	7.61	2.08	20.2	3.94	—	3rd run to screen 5, final parameters
1110	7.78	1.66	19.6	~~4.24~~ 424	N/A	1ST run to screen 4, initial parameters
1135	—	—	—	—	N/A	2nd run, Collect MW-982-029
1206	7.83	2.23	20.3	431	N/A	3rd run, Final Parameters
1230	7.72	4.43	19.8	454	N/A	1ST RUN TO SCREEN 5, initial parameters
1240	—	—	—	—	N/A	2nd run, collect MW-982-028
1300	7.62	2.65	20.2	460	N/A	3rd run, final parameters.
1320	7.40	1.64	20.9	450	N/A	1ST run, initial Parameters, Screen 2
~~1400~~	~~7.09~~	~~2.01~~				
	~~7.09~~	~~2.01~~	~~21.7~~	~~451~~	~~N/A~~	
1335	—	—	—	—	—	2nd run Collect MW-982-026
1340	—	—	—	—	—	3rd run Collect MW-982-027 & final parameters
1400	7.09	2.01	21.7	451	N/A	
1415	7.40	71.8	22.9	432	N/A	1ST RUN TO Screen 1, initial parameters
1435	7.03	57.6	21.9	428	N/A	2nd run to screen 1 attempting to reduce turbidity
/						

SCREEN 2

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0244
Date : 5-4&5-98
Site Engineer : J. BRENNER ; D. DIRKIN

Well Number : MW-12
Equipment : HORIBA - U-10
DTR-15R
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESSURE PROFILE SHEET>		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0850	7.33	35.3	17.1	449	N/A	1ST RUN, INITIAL PARAMETERS (SCREEN 1 @ MW-12)
0905	7.14	35.5	16.6	447	N/A	2nd RUN, ATTEMPTING TO REDUCE TURBIDITY
1041	6.85	4.78	17.6	438	N/A	3rd RUN, (PURGED 6½ GALLONS)
1100	—	—	—	—	—	4TH RUN, QUIET MW-982-025
1120	6.98	4.75	17.5	439		5TH RUN. FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0244
Date : 4.28.98
Site Engineer : L. Darrenq

Well Number : MW-14
Equipment : _____
_____
Contractor : _____

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESSURE PROFILES SHEETS		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0910	8.04	1.86	19.8	304	-	Initial Rnn to screen # 5 - Parameters
0935	-	-	-	-	-	Collect MW-982-037 - VOAs, metals 1/2 Gm.
0955	8.34	0.97	20.6	304	-	3rd Rnn to screen #5 - collect Hex Cr, Cl04, final parameters
-	-	-	-	-	-	
1025	8.09	1.30	21.2	1,834		1st Run to screen #4, Initial Parameters
1050	-	-	-	-	-	Collect MW-982-036, VOCs, metals 1/2 Hex Cr
1107	8.10	1.53	22.3	1,841	-	Collect Hex Cr + Clo4 + final parameters -
-	-	-	-	-	-	
1135	7.92	1.35	21.9	1,837	-	1st Run to screen #3, Initial Parameters
1150	-	-	-	-	-	Collect MW-982-035 MS/MSD
1210	7.80	0.40	22.3	848		3rd Rnn to screen #3, collect Cam, Hex Cr, Clo4, parameters
-	-	-	-	-	-	
1237	7.46	4.86	21.4	1,150	-	1st Rnn to screen #2 - Initial parameters
1255	-	-	-	-	-	Collect MW-982-034
1315	7.14	4.63	22.8	1,190		3rd Rnn to screen #2, Final Parameters
-	-	-	-	-	-	
1333	7.05	3.08	24.0	1,170		1st Rnn to screen 1, Initial parameters
1355	-	-	-	-	-	Collect MW-982-033
1420	6.68	5.24	24.7	1,170		3rd Rnn to screen #1 Final parameters

Notes Sampling Procedures: _____

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0244
Date : 4/22/98
Site Engineer : J. BRENNAN, D. DIRIGN

Well Number : MW-17
Equipment : HORIBA U-10
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
0900	7.73	3.71	19.4	400	N/A	1ST RUN TO SCREEN #5; INITIAL PARAMETERS
0930	—	—	—	—	—	COLLECT MW-982-044
1005	7.50	3.96	19.1	405	N/A	3RD RUN TO SCREEN #5; FINAL PARAMETERS
1050	7.51	3.73	19.0	410	N/A	1ST RUN TO SCREEN #4; INITIAL PARAMETERS
1105	—	—	—	—	—	COLLECT MW-982-043; INCLUDING VOAS; METALS MS/MSD
1145	7.57	3.00	20.8	397	N/A	3RD RUN TO SCREEN #4 FINAL PARAMETERS
1220	8.94	2.15	19.5	254	N/A	1ST RUN TO SCREEN #2; INITIAL PARAMETERS
1230	—	—	—	—	—	COLLECT MW-982-041
1305	8.91	1.05	20.6	259	N/A	3RD RUN TO SCREEN #2. FINAL PARAMETERS
1335	7.17	1.70	21.6	351	N/A	1ST RUN TO SCREEN #1; INITIAL PARAMETERS
1350	—	—	—	—	—	COLLECT MW-982-040
1430	10.52	0.5	21.2	356	N/A	3RD RUN TO SCREEN #1 FINAL PARAMETERS

Notes Sampling Procedures: ____

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0244
Date : 5/11/98
Site Engineer : J. BRENNER, M. LOSI

Well Number : MW-17
Equipment : HORIBA U-10
DIT-ISCE
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
0908	7.63	3.61	15.3	350	N/A	1ST RUN TO SCREEN #3; INITIAL PARAMETERS
0920	—	—	—	—	—	COLLECT MW-962-042
1115	7.41	3.25	17.5	367	N/A	7TH 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
Date : 4/20/98
Site Engineer : MILES1

Well Number : MW-19
Equipment : HORIBA U-10
HFS DRT CE
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESSURE PROFILES SHEETS		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1355	8.32	0.07	23.0	282	—	1ST RUN 8 SCREENS, INITIAL PARAMS,
1428	—	—	—	—	—	2ND RUN, SAMPLE MW-982-049
1505	8.47	0.05	22.3	284	—	3RD RUN, SAMPLE MW-982-049, FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0244
Date : 4/21/98
Site Engineer : J. BRENNER, D. DIRKIN
Well Number : MW-18
Equipment : HORIBA U-10
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESSURE PROBES		
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	7.89	0.04	19.3	343		1st RUN to SCREEN #4
0925	"	"	"	"		Collect MW-982-04 & QA/QC, Metals
0955	7.93	0.04	20.4	349		Collect Hexchrom / Perchlorate Filtered
"	"	"	"	"	"	"
1025	7.70	9.04	20.3	466		1st RUN to SCREEN #3, Turbidity Parameters - NTUs = 0.04
1050	"	"	"	"	"	Collect MW-982-047, VOCs, Metals, Anions
1110	7.60	0.06	20.7	465	"	Collect Hexcr, ClO4, Filtered Parameters
"	"	"	"	"	"	"
1145	7.53	0.05	21.5	430		1st RUN to SCREEN #2 - Additional Parameters
1200	"	"	"	"	"	Collect MW-982-046 - VOCs, Metals, Anions
1230	7.36	0.06	22.1	432		Collect Hexcr, ClO4, Parameters
"	"	"	"	"	"	"
1259	7.07	0.08	23.1	354		1st RUN to SCREEN #1 - Parameters NTU = 0.08
1315	"	"	"	"	"	2nd RUN - Collect MW-982-045
1350	6.90	0.14	21.9	356		3rd RUN - Get Hexchrom, ClO4 & Filtered parameters
"	"	"	"	"	"	"

Notes Sampling Procedures: _____

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0244
Date : 4/24/98
Site Engineer : J. BRENNER, M. LOSI

Well Number : MW-19
Equipment : HORIBA U-10
DRT-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
0842	7.74	3.96	17.3	582	N/A	1ST RUN TO SCREEN #5, INITAL PARAMETERS
0905	—	—	—	—	—	COLLECT MW-982-054
0935	8.03	4.63	16.7	589	N/A	3RD RUN TO SCREEN #5 FINAL PARAMETERS
0958	7.40	11.9	17.4	599	N/A	1ST RUN TO SCREEN #4, INITAL PARAMETERS
1020	7.67	4.75	17.7	600	—	2ND RUN, COLLECT MW-982-053
1040	7.59	4.81	18.9	605	N/A	3RD RUN TO SCREEN #4 FINAL PARAMETERS
1165	7.25	2.35	18.4	806	N/A	1ST RUN TO SCREEN #3, INITAL PARAMETERS
1130	—	—	—	—	—	COLLECT MW-982-052
1150	7.18	3.61	17.9	819	N/A	3RD RUN TO SCREEN #3 FINAL PARAMETERS
1210	6.91	2.28	18.1	784	N/A	1ST RUN TO SCREEN #2 INITAL PARAMETERS
1235	—	—	—	—	—	COLLECT MW-982-051
1300	6.73	2.90	17.6	796	N/A	3RD RUN TO SCREEN #2 FINAL PARAMETERS
1320	7.15	2.15	17.7	296	N/A	1ST RUN TO SCREEN #1, INITAL PARAMETERS
1345	—	—	—	—	—	COLLECT MW-982-050
1405	7.00	3.15	17.5	285	N/A	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 : 1572.0244
Date : 4/23/98
Site Engineer : J. BRENNER, M. LOSI

Well Number : MW-20
Equipment : HORIBA U-10
DRT-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
0839	9.06	1.10	17.2	358	N/A	1ST RUN TO SCREEN #5; INITIAL PARAMETERS
0910	—	—	—	—	—	COLLECT MW-982-059
0935	8.97	0.69	17.5	355	N/A	3RD RUN TO SCREEN #5; FINAL PARAMETERS
1014	8.46	1.71	18.0	325	N/A	1ST RUN TO SCREEN #4; INITIAL PARAMETERS
1040	—	—	—	—	—	COLLECT MW-982-058
1110	8.41	1.28	17.6	327	N/A	3RD RUN TO SCREEN #4; FINAL PARAMETERS
		±				
1204	8.29	1.29	18.1	448	N/A	1ST RUN TO SCREEN # 3; INITIAL PARAMETERS
1230	—	—	—	—	—	COLLECT MW-982-057
1245	8.26	0.81	18.2	443	N/A	3RD RUN TO SCREEN # 3; FINAL PARAMETERS
1310	7.50	1.35	17.6	416	N/A	1ST RUN TO SCREEN # 2; INITIAL PARAMETERS
1330	—	—	—	—	—	COLLECT MW-982-056 MS/MSD VOA & METALS
1350	7.26	0.59	17.2	428	N/A	3RD RUN TO SCREEN # 2; FINAL PARAMETERS
1411	7.54	2.93	17.7	697	N/A	1ST RUN TO SCREEN # 1; INITIAL PARAMETERS
1430	—	—	—	—	—	COLLECT MW-982-055
1450	7.29	1.93	18.1	719	N/A	3RD RUN TO SCREEN #1 FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0244
Date : 4/27/99
Site Engineer : J.BRENNER, D.DIRKIN

Well Number : MW-21
Equipment : HORIBA U-10
DRT-ISCE
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PIEZOMETER 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
0906	7.86	11.5	18.6	725	N/A	1ST RUN TO SCREEN #5; INITIAL PARAMETERS
0926	7.66	26.4	19.2	741	N/A	2ND RUN TO SCREEN #5; ATTEMPT TO REDUCE TURBIDITY
0948	7.63	27.5	18.7	739	N/A	3RD RUN TO SCREEN #5 - WILL RETURN LATER
1015	7.38	4.64	20.0	751	N/A	1ST RUN TO SCREEN #4 INITIAL PARAMETERS
1020	—	—	—	—	—	2ND RUN; COLLECT MW-982-003 MS/MSD VOA'S & METALS
1045	7.11	1.53	21.5	748	N/A	3RD RUN TO SCREEN #4; FINAL PARAMETERS
1104	7.68	4.10	20.9	847	N/A	1ST RUN TO SCREEN #3, INITIAL PARAMETERS
1115	—	—	—	—	—	COLLECT MW-982-002
1135	7.39	4.81	21.9	858	N/A	3RD RUN TO SCREEN #3, FINAL PARAMETERS
1216	7.21	1.76	21.1	1070	N/A	1ST RUN TO SCREEN #2; INITIAL PARAMETERS
1225	—	—	—	—	—	COLLECT MW-982-001
1245	6.83	1.77	22.5	1080	N/A	3RD RUN TO SCREEN #2; FINAL PARAMETERS
1301	6.99	0.65	22.8	785	N/A	1ST RUN TO SCREEN #1; INITIAL PARAMETERS
1320	—	—	—	—	—	COLLECT MW-982-060
1325	6.71	0.56	24.3	770	N/A	3RD RUN TO SCREEN #1; FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0244
Date : 4/27/99
Site Engineer : J. BRENNER, D. DIRVIN

Well Number : MW-21
Equipment : HORIBA U-10, DRT-15CE
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESSURE 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
1449	7.73	4.63	22.9	722	N/A	4TH RUN TO STABILIZE PARAMETERS AFTER PURGING 2.5 GAL
1510	—	—	—	—	—	COLLECT MW-982-064
1528	7.72	4.71	22.1	743	N/A	

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572 0244
Date : 9/6/98
Site Engineer : T. Slaney

Well Number : MW-22
Equipment : HORIBA U-10
DRT-15CE
Contractor : N/A

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
						Screen #5
1205	8.82	2.91	19.7	384	—	1ST Run; Initial Parameters; Reading Sample
1220	—	—	—	—	—	Sample MW-982-069
1250	8.80	3.52	20.3	384	—	Final Run @ Screen #5
1255	7.79	3.04	20.1	342	—	1ST Run; Screen #4; Initial Parameters
1335					—	Sample MW-982-068
1352	7.75	3.25	19.9	357	—	Final Parameters @ Screen #4
1400	8.04	2.89	20.1	425	—	1ST Run; Screen #3; Initial Parameters
1430					—	Sample MW-982-067
1450	8.02	2.67	20.7	435	—	Final Parameters @ Screen #3
—	—	—	—	—	—	—
0900	8.02	6.33	18.7	620	—	Initial Run to Screen #2 - Parameters
0920	8.05	4.71	18.9	639	—	2nd Run to Screen #2 - Reducing Turbidity
0945	—	—	—	—	—	Collect MW-982-066
1003	8.01	3.82	18.6	643	—	Final Run @ Screen #2
—	—	—	—	—	—	
1031	7.74	4.62	18.8	1260		1st Run to Screen #1, Parameters
1050	—	—	—	—	—	Collect MW-982-065
1110	7.36	4.63	20.5	1280		3rd Run to Screen #1 - Parameters

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572-0244
Date : 5/8/98
Site Engineer : L DeRaq

Well Number : MW-23
Equipment : Horiba U-10
DRT-15CE
Contractor : NA

	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
0840	6.98	4.86	18.5	385		1st Run to screen #4 - initial parameters.
0915	—	—	—	—	—	collect MW-982-073
0925	7.67	3.54	20.0	348		Final Run - Final Parameters
—	—	—	—	—	—	—
0953	7.82	65.3	19.8	431		1st Run to screen 3 - initial parameters
—	—	—	—	—	—	Will Return to screen 3 Later
1020	7.37	4.69	19.7	952		1st Run to screen #2 - initial parameters
1045	—	—	—	—	—	Collect MW-982-071 - 1st set of metals ms/msd
1100	7.01	6.08	19.4	1,002		3rd Run - final parameters.
—	—	—	—	—	—	—
1125	7.12	4.45	19.0	1020		Initial Run to screen #1 parameters.
1145	—	—	—	—	—	collect MW-982-070
1155	6.76	6.68	19.4	1030	—	
—	—	—	—	—	—	—
1220	7.88	8.02	19.9	450		2nd Run to screen #3 - trying to reduce turbidity
1250	7.63	4.63	20.1	439	—	3rd Run, Collect MW-982-072
1305	7.77	4.75	20.2	455	—	4th Run - final parameters.
—	—	—	—	—	—	—
1340 ~~45~~	9.35	2.37	19.3	490		1st Run to screen #5 - initial parameters
1455	—	—	—	—	—	collect MW-982-074
1445	9.38	1.96	19.7	504		3rd Run - final Parameters

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0244
Date : 5-5-98
Site Engineer : S. BRENJE & D. DIRKIN

Well Number : MW-24
Equipment : HORIBA U-10
DRT - 15C
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
1100	8.13	35.9	18.6	416	N/A	1ST RUN INITIAL PARAMETERS Screen #5
1120	7.80	~~96~~ 3.96	19.8	382	N/A	2nd RUN, REDUCE TURBIDITY
1200	—	—	—	—	—	3rd RUN, COLLECT MW-982-079
1225	7.79	4.16	19.8	374	N/A	4th RUN, FINAL PARAMETERS
1250	8.44	4.31	20.2	327	N/A	1ST RUN, INITIAL PARAMETERS Screen #4
1310	—	—	—	—	—	COLLECT SAMPLE MW-982-078
1330	8.52	3.73	20.0	374	N/A	3rd RUN, FINAL PARAMETERS
1355	7.63	129.4	19.0	395	N/A	1ST RUN, INITIAL PARAMETERS
						DECIDED TO ATTEMPT TO SAMPLE @
						SCREEN 2 DUE TO HIGH TURBID @
						SCREEN 3
1415	8.66	20.4	20.1	341	N/A	1ST RUN, INITIAL PARAMETERS Screen #2
1435	8.72	4.46	20.8	343	N/A	2nd RUN ATTEMPTING TO REDUCE TURBIDITY
1500	—	—	—	—	—	COLLECT SAMPLE MW-982-076
1524	8.76	7.21	20.0	339	N/A	4th RUN FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 157202.44
Date : 5/6/98
Site Engineer : T. Blaney
Well Number : MW-24
Equipment : HORIBA U-10
DRT-15CE
Contractor : N/A

	Before	Reference Point	After
Depth to Water (ft)	* See Pressure Profile Sheets *		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0800	~~7.49~~	~~32.2~~				START 1ST Run @ Screen #3
0842	7.49	32.2	19.9	405	—	1ST Run Screen #3; Reducing TURBIDITY
0905	7.71	19.3	20.4	421	—	2ND Run; Reducing TURBIDITY
0930	7.72	18.6	20.0	424	—	3RD RUN; REDUCING TURBIDITY
0950	7.74	18.7	20.5	425	—	4TH RUN; ATTEMPTING TO REDUCE TURBIDITY
1010	7.73	10.7	20.6	424	—	5TH Run; Reducing TURBIDITY
1033	7.72	4.9	20.5	423	—	6TH Run; Ready to Sample
1045						Sample MW-982-077
1045						Sample MW-982-077-MS
1045						Sample MW-982-077-MSD
1115	7.74	4.3	20.5	425	—	FINAL Parameters @ Screen #3.

Notes Sampling Procedures: _____

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0144
Date : 5/11/98
Site Engineer : J. BRENNER, M. LOSI

Well Number : MW-24
Equipment : HORIBA U-10
DIRT-15CE
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	* SEE PRESS. PIEZOMETER SHEETS		
Depth to Sediment (ft)			
Thickness of Sediment (ft)			

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1304	7.68	2.65	19.3	401	N/A	1ST RUN TO SCREEN #1; INITIAL PARAMETERS
1320	—	—	—	—	—	COLLECT MW-98Z-075
1500	7.59	3.67	19.7	410	N/A	7TH RUN TO SCREEN #1; FINAL PARAMETERS

Notes Sampling Procedures: _____

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Field Water Level Measurements

DATE: 4/17/98
PERSONNEL: T. Blakley
WEATHER: Sunny, 80°F
PROJECT NAME: JPL
PROJECT OFS: 1572.0221 / 1572.0244
MEASUREMENT DEVICE: Solinst Water level meter
COMMENTS:

Time	Well I.D.	Top of Casing Elev. Measuring Point (feet above MSL)	Depth to Water from Measuring Point (feet)	Elevation of Groundwater (feet above MSL)
	MW-1	1116.69	22.63	1094.06
	MW-5	1071.62	48.86	1022.76
	MW-6	1188.54	177.21	1011.33
	MW-7	1212.90	200.91	1011.99
	MW-8	1139.55	124.51	1015.04
	MW-9	1106.06	19.16	1086.90
	MW-10	1087.73	70.97	1016.76
	MW-13	1183.49	171.70	1011.79
	MW-15	1120.68	28.93	1091.75
	MW-16	1236.29	225.30	1010.99
	MH01	1099.78	96.76	1003.02

E-12a

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Field Water Level Measurements

DATE: 5/18/98

PERSONNEL: T. Blaney

WEATHER: Sunny, Hot 80°F

PROJECT NAME: JPL

PROJECT OFS: 1572 0221

MEASUREMENT DEVICE: Solinst H_2O level meter

COMMENTS:

Time	Well I.D.	Top of Casing Elev. Measuring Point (feet above MSL)	Depth to Water from Measuring Point (feet)	Elevation of Groundwater (feet above MSL)
	mw-1	1116.69	21.97	1094.72 ✓
	mw-5	1071.62	46.61	1025.01 ✓
	mw-6	1188.54	174.83	1013.71 ✓
	mw-7	1212.90	194.90	1018.00 ✓
	mw-8	1139.55	119.09	1020.46 ✓
	mw-9	1106.06	18.54	1087.52 ✓
	mw-10	1087.73	68.61	1019.12 ✓
	mw-13	1183.49	166.68	1016.81 ✓
	mw-15	1120.68	28.11	1092.57 ✓
	mw-16	1236.29	219.78	1016.51 ✓
	MH01	1099.78	92.86	1006.92

E-12a

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: 4/17/98
Job No.: 1572
Serial No.: 1455
Well Name: MW-3
Elevation of Datum(ft msl): 1100.34
Range: 0 to 750 psia
Client: Jet Propulsion Laboratory
Weather: 80 degrees, Sunny
Casing Size: 1.5-inch Westbay Casing
Operator: M. Losi, L. Darragh
Ambient Reading (Pressure/Temperature/Time) Start: 14.11/22.62/1657
Finish: 14.08/21.81/1718

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	653	160.55			22.98	1715		204.75	895.59
			208.40						
			208.42						
			208.42						
				160.50					
4	558	119.31			21.62	1712		178.20	922.14
			178.74						
			178.76						
			178.71						
				119.28					
3	346	27.40			21.09	1708		111.05	989.29
			115.96						
			115.92						
			115.96						
				27.36					
2	252	14.17			21.45	1706		106.26	994.08
			77.28						
			77.29						
			77.25						
				14.13					
1	172	14.20			22.57	1659		93.15	1007.19
			48.26						
			48.29						
			48.28						
				14.20					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 4/17/98 | Job No.: 1572

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

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

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

Operator: M. Losi, L. Darragh

Ambient Reading (Pressure/Temperature/Time) Start: 14.21/24.01/1357 | Finish: 14.24/23.02/1415

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	125.80			22.17	1410		164.81	918.03
			165.17						
			165.15						
			165.17						
				125.77					
4	392	73.30			21.72	1405		97.65	985.19
			141.82						
			141.84						
			141.82						
				73.32					
3	322	42.82			21.98	1404		89.15	993.69
			115.14						
			115.19						
			115.16						
				42.79					
2	240	14.28			23.03	1401		84.47	998.37
			81.64						
			81.66						
			81.64						
				14.29					
1	150	14.38			24.04	1359		62.84	1020.00
			52.01						
			51.96						
			52.06						
				14.36					

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: 4/17/98 | Job No.: 1572

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

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

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

Operator: M. Losi, L. Darragh

Ambient Reading (Pressure/Temperature/Time) Start: 13.88/28.37/1327 | Finish: 14.01/20.03/1348

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	158.10			21.76	1342		205.76	933.54
			201.75						
			201.77						
			201.75						
				158.05					
4	524	108.61			21.04	1339		152.77	986.53
			174.86						
			174.89						
			174.87						
				108.58					
3	429	67.40			21.83	1336		145.71	993.59
			136.76						
			136.74						
			136.76						
				67.71					
2	259	13.96			24.87	1333		131.71	1007.59
			69.11						
			69.14						
			69.13						
				13.92					
1	149	13.85			27.07	1330		107.25	1032.05
			32.07						
			32.02						
			32.04						
				13.82					

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: 4/17/98 | Job No.: 1572

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

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

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

Operator: M. Losi, L. Darragh

Ambient Reading (Pressure/Temperature/Time) Start: 13.82/34.55/1300 | Finish: 14.00/20.59/1318

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	108.82			22.63	1312		171.38	930.76
			177.18						
			177.16						
			177.19						
				108.80					
4	436	59.77			23.48	1309		118.99	983.15
			151.33						
			151.32						
			151.35						
				59.79					
3	323	13.92			29.81	1306		106.15	995.99
			107.91						
			107.93						
			107.90						
				13.91					
2	243	13.91			31.63	1303		101.65	1000.49
			75.20						
			75.18						
			75.17						
				13.93					
1	140	13.86			33.65	1301		79.80	1022.34
			40.00						
			40.02						
			40.00						
				13.86					

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: 4/17/98 | Job No.: 1572

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

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

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

Operator: M. Losi, L. Darragh

Ambient Reading (Pressure/Temperature/Time) Start: 14.15/26.12/1540 | Finish: 14.10/20.59/1603

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	540	142.64			21.00	1600		159.90	1013.57
			178.90						
			178.91						
			178.88						
				142.60					
4	456	106.23			20.55	1558		159.38	1014.09
			142.71						
			142.73						
			142.69						
				106.26					
3	382	74.00			21.57	1548		159.34	1014.13
			110.66						
			110.63						
			110.65						
				73.89					
2	277	28.51			23.38	1545		159.83	1013.64
			64.90						
			64.94						
			64.92						
				28.48					
1	207	14.17			24.01	1543		160.67	1012.80
			34.20						
			34.22						
			34.21						
				14.19					

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: 4/17/98 | Job No.: 1572

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

Elevation of Datum(ft msl): 1191.21 | Range: 0 to 750 psia | Weather: 80 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: M. Losi, L. Darragh

Ambient Reading (Pressure/Temperature/Time) Start: 14.21/15.44/0928 | Finish: 14.19/17.06/0946

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	726	172.79			18.50	944		270.43	920.78
			211.70						
			211.67						
			211.70						
				172.69					
4	582	110.32			16.48	940		262.66	928.55
			152.28						
			153.31						
			152.31						
				110.31					
3	468	60.84			15.75	936		228.05	963.16
			118.22						
			118.20						
			118.24						
				60.84					
2	370	18.34			15.84	932		207.95	983.26
			84.44						
			84.46						
			84.44						
				18.36					
1	250	14.38			16.25	929		183.21	1008.00
			43.14						
			43.16						
			43.16						
				14.39					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 4/17/98 | Job No.: 1572

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

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

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

Operator: M. Losi, L. Darragh

Ambient Reading (Pressure/Temperature/Time) Start: 14.22/21.90/0952 | Finish: 14.25/22.31/1022

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	149.40			21.48	1017		279.84	945.57
			189.44						
			189.42						
			189.46						
				149.38					
4	564	97.30			19.52	1013		269.76	955.65
			141.79						
			141.79						
			141.79						
				97.36					
3	424	36.54			19.56	1010		243.67	981.74
			92.45						
			92.40						
			92.38						
				36.56					
2	330	14.32			21.40	958		243.58	981.83
			51.70						
			51.72						
			51.68						
				14.32					
1	270	14.35			22.13	955		243.42945	981.98055
			25.76						
			25.74						
			25.76						
				14.34					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 4/17/98 | Job No.: 1572

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

Elevation of Datum(ft msl): 1142.94 | Range: 0 to 750 psia | Weather: 80 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: M. Losi, L. Darragh

Ambient Reading (Pressure/Temperature/Time) Start: 14.34/24.60/1115 | Finish: 14.24/18.18/1136

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	77.53			18.40	1134		254.59	888.35
			119.79						
			119.84						
			119.79						
				77.50					
4	444	54.05			18.74	1130		252.01	890.93
			97.50						
			97.55						
			97.50						
				54.00					
3	392	31.47			20.23	1127		173.72	969.22
			108.92						
			108.90						
			108.92						
				31.42					
2	314	14.37			23.10	1123		169.19	973.75
			77.09						
			77.05						
			77.05						
				14.37					
1	242	14.34			24.53	1117		142.82	1000.12
			57.29						
			57.27						
			57.29						
				14.39					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 4/17/98 | Job No.: 1572

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

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

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

Operator: M. Losi, L. Darragh

Ambient Reading (Pressure/Temperature/Time) Start: 14.32/21.79/1035 | Finish: 14.14/19.16/11.05

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	266.42			22.55	1102		195.46	969.59
			319.66						
			319.63						
			319.66						
				266.40					
4	700	179.71			21.28	1100		214.46	950.59
			224.72						
			224.69						
			224.72						
				179.76					
3	562	119.72			20.44	1057		208.07	956.98
			167.67						
			167.64						
			167.67						
				119.70					
2	392	46.17			19.48	1040		202.12	962.93
			96.55						
			96.53						
			96.55						
				46.12					
1	230	14.44			21.85	1037		204.94	960.11
			25.10						
			25.08						
			25.10						
				14.38					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 4/17/98 | Job No.: 1572

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

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

Ambient Reading (Pressure/Temperature/Time) Start: 14.31/24.39/1157 | Finish: 14.30/20.71/1215

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	122.04			20.49	1213		46.64	1012.46
			155.32						
			155.37						
			155.35						
				122.05					
4	310	95.09			20.23	1210		46.53	1012.57
			128.51						
			128.53						
			128.52						
				95.10					
3	240	65.02			20.35	1206		44.93	1014.17
			98.86						
			98.88						
			98.86						
				65.07					
2	161	30.75			22.30	1203		43.38	1015.72
			65.30						
			65.28						
			65.30						
				30.76					
1	90	14.24			24.39	1200		42.683584	1016.4164
			34.81						
			34.83						
			34.81						
				14.22					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 4/17/98 | Job No.: 1572

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

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

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

Operator: M. Losi, L. Darragh

Ambient Reading (Pressure/Temperature/Time) Start: 14.15/28.05/1502 | Finish: 14.12/22.40/1528

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	167.00			21.83	1525		194.45	982.53
			184.73						
			184.76						
			184.73						
				167.05					
4	467	114.50			21.72	1522		184.46	992.52
			136.64						
			136.61						
			136.60						
				114.54					
3	389	80.67			21.87	1511		168.70	1008.28
			109.64						
			109.62						
			109.64						
				80.68					
2	329	54.61			21.66	1508		168.89	1008.09
			83.53						
			83.56						
			83.54						
				54.59					
1	245	17.75			23.32	1504		166.56	1010.42
			48.15						
			48.12						
			48.15						
				17.77					

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: 4/17/98 | Job No.: 1572

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

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

Ambient Reading (Pressure/Temperature/Time) Start: 14.16/23.19/1624 | Finish: 14.20/21.52/1642

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	163.33			21.59	1639		124.78	984.06
			195.05						
			195.03						
			195.06						
				163.30					
4	445	121.19			21.18	1637		124.81	984.03
			152.98						
			152.97						
			153.00						
				121.11					
3	319	66.49			21.01	1634		104.77	1004.07
			107.02						
			107.07						
			107.06						
				66.53					
2	254	38.38			21.78	1630		103.67	1005.17
			79.33						
			79.36						
			79.36						
				38.40					
1	174	14.16			22.73	1627		96.07	1012.77
			47.97						
			47.95						
			47.97						
				14.21					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 4/17/98 | Job No.: 1572

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

Elevation of Datum(ft msl): 1200.94 | Range: 0 to 750 psia | Weather: 80 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: M. Losi, L. Darragh

Ambient Reading (Pressure/Temperature/Time) Start: 14.11/26.95/1426 | Finish: 14.03/21.63/1448

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	189.36			22.65	1446		242.41	958.53
			202.91						
			202.89						
			202.89						
				189.41					
4	554	136.01			22.22	1442		222.27	978.67
			157.88						
			157.86						
			157.88						
				135.91					
3	435	83.44			22.16	1439		200.36	1000.58
			115.80						
			115.78						
			115.78						
				83.42					
2	373	57.05			22.13	1436		196.70	1004.24
			90.47						
			90.52						
			90.50						
				57.10					
1	279	16.22			23.19	1433		188.24	1012.70
			53.40						
			53.42						
			53.42						
				15.91					

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: 5/18/98 | Job No.: 1572

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

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

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

Operator: M. Losi, D. Dirkin

Ambient Reading (Pressure/Temperature/Time) Start: 14.22/21.22/1450 | Finish: 14.15/20.40/1502

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	653	160.60			22.52	1453		213.59	886.75
			204.67						
			204.67						
			204.67						
				160.58					
4	558	119.35			22.96	1455		183.46	916.88
			176.55						
			176.55						
			176.55						
				119.35					
3	346	27.40			22.24	1457		108.99	991.35
			116.93						
			116.93						
			116.93						
				27.37					
2	252	14.27			21.18	1459		103.41	996.93
			78.60						
			78.60						
			78.60						
				14.29					
1	172	14.24			21.02	1501		89.87	1010.47
			49.79						
			49.79						
			49.79						
				14.22					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 5/18/98 | Job No.: 1572

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

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

Ambient Reading (Pressure/Temperature/Time) Start: 14.13/24.63/1345 | Finish: 14.17/20.64/1358

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	125.62			23.92	1349		170.21	912.63
			162.75						
			162.75						
			162.75						
				125.66					
4	392	73.10			23.10	1351		96.94	985.90
			142.06						
			142.06						
			142.06						
				73.02					
3	322	42.73			22.40	1353		87.51	995.33
			115.80						
			115.80						
			115.80						
				42.75					
2	240	14.23			21.89	1355		81.96	1000.88
			82.66						
			82.66						
			82.66						
				14.25					
1	150	14.20			21.20	1357		59.43	1023.41
			53.41						
			53.41						
			53.41						
				14.25					

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: 5/18/98 | Job No.: 1572

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

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

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

Operator: M. Losi, D. Dirkin

Ambient Reading (Pressure/Temperature/Time) Start: 14.13/21.63/1210 | Finish: 14.15/20.10/1231

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	639	157.74			22.13	1217		210.44	928.86
			199.92						
			199.92						
			199.92						
				157.74					
4	524	108.11			21.85	1220		155.58	983.72
			173.85						
			173.85						
			173.85						
				108.15					
3	429	67.44			20.39	1224		145.15	994.15
			137.19						
			137.19						
			137.19						
				67.37					
2	259	14.24			19.82	1227		127.90	1011.40
			70.97						
			70.97						
			70.97						
				14.23					
1	149	14.19			19.23	1229		102.68	1036.62
			34.22						
			34.22						
			34.22						
				14.21					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 5/18/98 | Job No.: 1572

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

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

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

Operator: M. Losi, D. Dirkin

Ambient Reading (Pressure/Temperature/Time) Start: 14.25/22.77/1428 | Finish: 14.12/18.98/1441

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	548	144.61			22.10	1431		176.52	925.62
			175.22						
			175.22						
			175.22						
				144.61					
4	436	95.99			21.38	1434		118.69	983.45
			151.74						
			151.74						
			151.74						
				95.98					
3	323	46.74			20.67	1437		103.38	998.76
			109.39						
			109.39						
			109.39						
				46.84					
2	243	14.22			19.85	1439		98.33	1003.81
			76.90						
			76.90						
			76.90						
				14.22					
1	140	14.12			19.62	1440		76.18	1025.96
			41.85						
			41.85						
			41.85						
				14.17					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 5/18/98 | Job No.: 1572

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

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

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

Operator: M. Losi, D. Dirkin

Ambient Reading (Pressure/Temperature/Time) Start: 14.31/23.83/1144 | Finish: 14.17/19.88/1158

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	540	142.17			22.58	1148		161.31	1012.16
			178.40						
			178.40						
			178.40						
				142.24					
4	456	105.62			21.83	1150		159.99	1013.48
			142.56						
			142.56						
			142.56						
				105.76					
3	382	73.64			21.53	1152		159.85	1013.62
			110.54						
			110.54						
			110.54						
				73.62					
2	277	28.09			20.55	1154		159.58	1013.89
			65.14						
			65.14						
			65.14						
				28.05					
1	207	14.27			20.05	1156		159.62	1013.85
			34.78						
			34.78						
			34.78						
				14.19					

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: 5/18/98 | Job No.: 1572

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

Elevation of Datum(ft msl): 1191.21 | Range: 0 to 750 psia | Weather: 85 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: M. Losi, D. Dirkin

Ambient Reading (Pressure/Temperature/Time) Start: 14.13/20.20/0933 | Finish: 14.14/16.17/0947

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	726	172.10			18.39	938		275.28	915.93
			209.52						
			209.52						
			209.52						
				172.18					
4	582	109.69			19.55	940		265.08	926.13
			151.52						
			151.52						
			151.52						
				109.66					
3	468	60.12			17.95	942		222.54	968.67
			120.54						
			120.54						
			120.54						
				60.15					
2	370	17.37			17.14	944		203.23	987.98
			86.43						
			86.43						
			86.43						
				17.48					
1	250	14.24			16.22	946		176.24	1014.97
			46.11						
			46.11						
			46.11						
				14.22					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 5/18/98 | Job No.: 1572

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

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

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

Operator: M. Losi, D. Dirkin

Ambient Reading (Pressure/Temperature/Time) Start: 14.15/17.89/0956 | Finish: 14.12/17.57/1009

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	149.01			20.04	1000		283.71	941.70
			187.66						
			187.66						
			187.66						
				149.03					
4	564	96.93			20.60	1002		266.23	959.18
			143.22						
			143.22						
			143.22						
				96.93					
3	424	36.20			19.88	1005		237.64	987.77
			94.92						
			94.92						
			94.92						
				36.18					
2	330	14.24			18.27	1007		235.06	990.35
			55.29						
			55.29						
			55.29						
				14.31					
1	270	14.24			17.77	1009		233.97924	991.43076
			29.75						
			29.75						
			29.75						
				14.25					

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: 5/18/98 | Job No.: 1572

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

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

Ambient Reading (Pressure/Temperature/Time) Start: 14.37/22.57/1048 | Finish: 14.24/18.21/1102

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	78.88			19.62	1052		263.09	879.85
			116.14						
			116.14						
			116.14						
				78.85					
4	444	55.44			18.77	1055		260.21	882.73
			93.98						
			93.98						
			93.98						
				55.42					
3	392	32.85			18.51	1058		173.05	969.89
			109.22						
			109.22						
			109.22						
				32.95					
2	314	14.26			18.55	1059		167.48	975.46
			77.82						
			77.82						
			77.82						
				14.26					
1	242	14.26			18.60	1101		140.58	1002.36
			58.27						
			58.27						
			58.27						
				14.24					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 5/18/98 | Job No.: 1572

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

Elevation of Datum(ft msl): 1165.05 | Range: 0 to 750 psia | Weather: 85 degrees, Sunny | Client: Jet Propulsion Laboratory | Casing Size: 1.5-inch Westbay Casing | Operator: M. Losi, D. Dirkin

Ambient Reading (Pressure/Temperature/Time) Start: 14.19/18.90/1015 | Finish: 14.09/17.04/10.35

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	900	265.42			22.36	1026		192.76	972.29
			320.73						
			320.73						
			320.73						
				265.98					
4	700	179.02			22.56	1028		224.01	941.04
			220.48						
			220.48						
			220.48						
				179.06					
3	562	119.03			21.75	1030		207.47	957.58
			167.83						
			167.83						
			167.83						
				119.08					
2	392	45.37			20.20	1033		196.41	968.64
			98.93						
			98.93						
			98.93						
				45.34					
1	230	14.22			18.51	1035		199.04	966.01
			27.56						
			27.56						
			27.56						
				14.22					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 5/18/98 | Job No.: 1572

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

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

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

Operator: M. Losi, D. Dirkin

Ambient Reading (Pressure/Temperature/Time) Start: 14.35/21.40/1115 | Finish: 14.34/19.30/1122

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	132.04			20.45	1119		48.30	1010.80
			154.67						
			154.67						
			154.67						
				132.06					
4	310	105.21			20.52	1121		48.21	1010.89
			127.83						
			127.83						
			127.83						
				105.23					
3	240	75.10			20.17	1123		46.36	1012.74
			98.29						
			98.29						
			98.29						
				75.15					
2	161	40.83			19.40	1125		44.56	1014.54
			64.82						
			64.82						
			64.82						
				40.86					
1	90	14.27			19.34	1127		44.15225	1014.9478
			34.22						
			34.22						
			34.22						
				14.29					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 5/18/98 | Job No.: 1572

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

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

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

Operator: M. Losi, D. Dirkin

Ambient Reading (Pressure/Temperature/Time) Start: 14.15/22.30/1258 | Finish: 14.19/20.95/1309

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	588	166.59			22.44	1301		195.61	981.37
			184.27						
			184.27						
			184.27						
				166.52					
4	467	114.14			22.40	1303		184.85	992.13
			136.48						
			136.48						
			136.48						
				114.17					
3	389	80.29			22.03	1305		167.69	1009.29
			110.11						
			110.11						
			110.11						
				80.29					
2	329	54.21			21.29	1307		167.43	1009.55
			84.21						
			84.21						
			84.21						
				54.26					
1	245	17.19			20.80	1309		162.44	1014.54
			49.96						
			49.96						
			49.96						
				17.24					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 5/18/98 | Job No.: 1572

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

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

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

Operator: M. Losi, D. Dirkin

Ambient Reading (Pressure/Temperature/Time) Start: 14.25/22.26/1404 | Finish: 14.22/20.27/1419

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	542	162.88			22.57	1408		126.28	982.56
			194.45						
			194.45						
			194.45						
				162.85					
4	445	120.76			22.16	1410		125.91	982.93
			152.56						
			152.56						
			152.56						
				120.74					
3	319	66.05			21.61	1412		103.83	1005.01
			107.51						
			107.51						
			107.51						
				66.12					
2	254	37.88			21.00	1415		102.27	1006.57
			80.01						
			80.01						
			80.01						
				37.91					
1	174	14.27			20.49	1418		92.60	1016.24
			49.52						
			49.52						
			49.52						
				14.29					

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: Top of 1.5" Casing | Probe Type: Westbay | Date: 5/18/98 | 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: 85 degrees, Sunny | Casing Size: 1.5-inch Westbay Casing

Operator: M. Losi, D. Dirkin

Ambient Reading (Pressure/Temperature/Time) Start: 14.20/21.22/1234 | Finish: 14.16/21.30/1246

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	678	188.77			22.31	1238		245.29	955.65
			201.76						
			201.76						
			201.76						
				188.72					
4	554	134.94			22.37	1340		223.69	977.25
			157.37						
			157.37						
			157.37						
				135.01					
3	435	83.07			22.14	1342		198.99	1001.95
			116.49						
			116.49						
			116.49						
				83.04					
2	373	56.34			22.08	1344		194.20	1006.74
			91.69						
			91.69						
			91.69						
				56.35					
1	279	15.64			21.43	1346		182.94	1018.00
			55.82						
			55.82						
			55.82						
				15.61					

TABLE 5-1
GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS
18-May-98

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-1		5/18/98	21.97	1116.69	1094.72
MW-3	1 (top)	5/18/98	89.87	1100.34	1010.47
	2	5/18/98	103.41	1100.34	996.93
	3	5/18/98	108.99	1100.34	991.35
	4	5/18/98	183.46	1100.34	916.88
	5	5/18/98	213.59	1100.34	886.75
MW-4	1 (top)	5/18/98	59.43	1082.84	1023.41
	2	5/18/98	81.96	1082.84	1000.88
	3	5/18/98	87.51	1082.84	995.33
	4	5/18/98	96.94	1082.84	985.90
	5	5/18/98	170.21	1082.84	912.63
MW-5		5/18/98	46.61	1071.62	1025.01
MW-6		5/18/98	174.83	1188.54	1013.71
MW-7		5/18/98	194.90	1212.90	1018.00
MW-8		5/18/98	119.09	1139.55	1020.46
MW-9		5/18/98	18.54	1106.06	1087.52
MW-10		5/18/98	68.61	1087.73	1019.12
MW-11	1 (top)	5/18/98	102.68	1139.30	1036.62
	2	5/18/98	127.90	1139.30	1011.40
	3	5/18/98	145.15	1139.30	994.15
	4	5/18/98	155.58	1139.30	983.72
	5	5/18/98	210.44	1139.30	928.86
MW-12	1 (top)	5/18/98	76.18	1102.14	1025.96
	2	5/18/98	98.33	1102.14	1003.81
	3	5/18/98	103.38	1102.14	998.76
	4	5/18/98	118.69	1102.14	983.45
	5	5/18/98	176.52	1102.14	925.62
MW-13		5/18/98	166.68	1183.49	1016.81
MW-14	1 (top)	5/18/98	159.62	1173.47	1013.85
	2	5/18/98	159.58	1173.47	1013.89
	3	5/18/98	159.85	1173.47	1013.62
	4	5/18/98	159.99	1173.47	1013.48
	5	5/18/98	161.31	1173.47	1012.16
MW-15		5/18/98	28.11	1120.68	1092.57
MW-16		5/18/98	219.78	1236.29	1016.51
MW-17	1 (top)	5/18/98	176.24	1191.21	1014.97
	2	5/18/98	203.23	1191.21	987.98
	3	5/18/98	222.54	1191.21	968.67
	4	5/18/98	265.08	1191.21	926.13
	5	5/18/98	275.28	1191.21	915.93

TABLE 5-1
GROUNDWATER MONITORING WELL WATER LEVEL MEASUREMENTS
18-May-98

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-18	1 (top)	5/18/98	233.98	1225.41	991.43
	2	5/18/98	235.06	1225.41	990.35
	3	5/18/98	237.64	1225.41	987.77
	4	5/18/98	266.23	1225.41	959.18
	5	5/18/98	283.71	1225.41	941.70
MW-19	1 (top)	5/18/98	140.58	1142.94	1002.36
	2	5/18/98	167.48	1142.94	975.46
	3	5/18/98	173.05	1142.94	969.89
	4	5/18/98	260.21	1142.94	882.73
	5	5/18/98	263.09	1142.94	879.85
MW-20	1 (top)	5/18/98	199.04	1165.05	966.01
	2	5/18/98	196.41	1165.05	968.64
	3	5/18/98	207.47	1165.05	957.58
	4	5/18/98	224.01	1165.05	941.04
	5	5/18/98	192.76	1165.05	972.29
MW-21	1 (top)	5/18/98	44.15	1059.10	1014.95
	2	5/18/98	44.56	1059.10	1014.54
	3	5/18/98	46.36	1059.10	1012.74
	4	5/18/98	48.21	1059.10	1010.89
	5	5/18/98	48.30	1059.10	1010.80
MW-22	1 (top)	5/18/98	162.44	1176.98	1014.54
	2	5/18/98	167.43	1176.98	1009.55
	3	5/18/98	167.69	1176.98	1009.29
	4	5/18/98	184.85	1176.98	992.13
	5	5/18/98	195.61	1176.98	981.37
MW-23	1 (top)	5/18/98	92.60	1108.84	1016.24
	2	5/18/98	102.27	1108.84	1006.57
	3	5/18/98	103.83	1108.84	1005.01
	4	5/18/98	125.91	1108.84	982.93
	5	5/18/98	126.28	1108.84	982.56
MW-24	1 (top)	5/18/98	182.94	1200.94	1018.00
	2	5/18/98	194.20	1200.94	1006.74
	3	5/18/98	198.99	1200.94	1001.95
	4	5/18/98	223.69	1200.94	977.25
	5	5/18/98	245.29	1200.94	955.65

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 653 Date: 4/29/98

Well Name: MW-3 Sampling Zone No.: 5 Starting Time: 0830 Finishing Time: 0950

Technicians J. BRENNER, D. DIRKIN

Water Level Inside MP Casing (Beginning of Session) 162.61 (PSIA) (End of Session) 162.53 (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	✓	✓	✓	✓	✓	✓	162.61	✓	0837	0839	✓	162.60	1.0	1ST RUN, INITIAL PARAMETERS; NTU'S = 1.98
2	✓	✓	✓	✓	✓	✓	162.56	✓	0903	0906	✓	162.57	1.0	2ND RUN: COLLECT MW-982-006 2 VOA'S, METALS, ANIONS, HEX. CR.
3	✓	✓	✓	✓	✓	✓	162.51	✓	0934	0937	✓	162.53	1.0	3RD RUN, PERCHLORATE; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP CASING = 204.87 (PSIA)

Total Volume: 3.0 L

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 558 Date: 4/29/98

Well Name: MW-3 Sampling Zone No.: 4 Starting Time: 0955 Finishing Time: 1110

Technicians J. BRENNER, D. DIRKIN

Water Level Inside MP Casing (Beginning of Session) 121.23 (PSIA) (End of Session) 121.20 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	121.23	✓	1001	1004	✓	121.22	1.0	1ST RUN @ INITIAL PARAMETERS; NTU'S = 3.56
2	✓	✓	✓	✓	✓	✓	121.22	✓	1026	1029	✓	121.22	1.0	2ND RUN; COLLECT MW-982-005 2 VOA'S, METALS, ANIONS, HEX. Cr.
3	✓	✓	✓	✓	✓	✓	121.16	✓	1051	1054	✓	121.20	1.0	3RD RUN; PERCHLORATE; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

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Comments: WATER LEVEL OUTSIDE MP CASING = 176.25 (PSIA) Total Volume: 3.0

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 346 Date: 4/29/98

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

Technicians J. BRENNER, D. DIRKIN

Water Level Inside MP Casing (Beginning of Session) 29.22 (PS.A) (End of Session) 29.18 (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	✓	✓	✓	✓	✓	✓	29.22	✓	1119	1123	✓	29.21	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 10.75
2	✓	✓	✓	✓	✓	✓	29.19	✓	1138	1141	✓	29.19	1.0	2ND RUN; CHECK TURBIDITY; NTUs = 4.7 COLLECT MW-992-004 2 VOAS, METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	29.16	✓	1213	1216	✓	29.18	1.0	3RD RUN; HEX CR, PERCHLORATE, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP CASING = 116.23 (PS.A)

Total Volume: 3.0 L [F2]

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 252 Date: 4/29/98

Well Name: MW-3 Sampling Zone No.: 2 Starting Time: 1220 Finishing Time: 1315

Technicians J. BRONNER, D. DIRICK

Water Level Inside MP Casing (Beginning of Session) 14.30 (PSIA) (End of Session) 14.31 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.30	✓	1224	1228	✓	14.31	1.0	1ST RUN; INITIAL PARAMETERS; NTUS = 4.30
2	✓	✓	✓	✓	✓	✓	14.30	✓	1243	1247	✓	14.29	1.0	2ND RUN; COLLECT MW-982-003 2 VOAS, METALS ANIONS HEX. CR
3	✓	✓	✓	✓	✓	✓	14.30	✓	1305	1307	✓	14.31	1.0	3RD RUN; PERCHLORATE; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP CASING = 78.11 (PSIA)

Total Volume: 3.0 L

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-3 Depth: 172 Date: 4/29/98

Well Name: MW-3 Sampling Zone No.: 1 Starting Time: 1330 Finishing Time: 1430

Technicians J. BRENNER, D. DIRKIN

Water Level Inside MP Casing (Beginning of Session) 14.31 (PSIA) (End of Session) 14.29 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.31	✓	1331	1335	✓	14.18	1.0	1ST RUN TO SCREEN #1, INITIAL PARAMETERS, NNS = 4.77
2	✓	✓	✓	✓	✓	✓	14.26	✓	1348	1353	✓	14.16	1.0	2ND RUN; COLLECT MW-98Z-002; MS/MSD VOCs; METALS, 6 VOAS METALS 1/2 ANIONS
3	✓	✓	✓	✓	✓	✓	14.34	✓	1406	1413	✓	14.29	1.0	3RD RUN; 1/2 ANIONS; HEX. CR. PERCHLORATE; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP CASING = 48.03 (PSIA)

Total Volume: 3.0 L F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 513' Date: 5-5-98

Well Name: MW-4 Sampling Zone No.: SCREEN 5 Starting Time: 1150 Finishing Time: 1305

Technicians: J. BRENNER & D. DIRKIN

Water Level Inside MP Casing (Beginning of Session) 127.80 (PS,A) (End of Session) 127.78 (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	✓	✓	✓	✓	✓	✓	127.80	✓	1158	1201	✓	127.80	1	1ST RUN, INITIAL PARAMETERS, NTUs = 3.78
2	✓	✓	✓	✓	✓	✓	127.80	✓	1223	1225	✓	127.83	1	2nd RUN, COLLECT MW-982-012, BVOAS, METALS, ANIONS (1/2)
3	✓	✓	✓	✓	✓	✓	127.80	✓	1249	1253	✓	127.78	1	3rd RUN, 1/2 ANIONS, Cr+6, CLO4 & final PARAMETERS. NTUs = 3.83
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP = 162.63 (PS,A)

Total Volume: 3L

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 392' Date: 5-4-98

Well Name: MW-4 Sampling Zone No.: SCREEN 4 Starting Time: 1311 Finishing Time: 1410

Technicians J. BREWER & D. DIRKIN

Water Level Inside MP Casing (Beginning of Session) 75.20 (PSIA) (End of Session) 75.18 (PSA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	75.20	✓	1316	1319	✓	75.20	1	1ST RUN, INITIAL PARAMETERS, NTUS = 2.04
2	✓	✓	✓	✓	✓	✓	75.19	✓	1335	1338	✓	75.20	1	2ND RUN, 2 VOAS, METALS, ANIONS, CR+6
3	✓	✓	✓	✓	✓	✓	75.12	✓	1356	1359	✓	75.18	1	3RD RUN) CLOY and FINAL PARAMETERS NTUS = 2.62
4														
5														
6														
7														
8														
9														
10														
11														
12														

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Comments: M/L OVERSIDE MP = 141.59 (PSIA)

Total Volume: 3L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 322' Date: 5-4-98

Well Name: MW-4 Sampling Zone No.: SCREEN 3 Starting Time: 1415 Finishing Time: 1505

Technicians: J. BRENNER ? D. DIRKIN

Water Level Inside MP Casing (Beginning of Session) 44.71 (PSIA) (End of Session) 43.71 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	44.71	✓	1424	1426	✓	44.72	1	1ST RUN, INITIAL PARAMETERS, NTUs = 3.15
2	✓	✓	✓	✓	✓	✓	44.68	✓	1440	1443	✓	44.74	1	2ND RUN, 2 VOAs, METAL, ANIONS, 1/2 GAL
3	✓	✓	✓	✓	✓	✓	43.73	✓	1458	1500	✓	43.71	1	3rd RUN, 1/2 GAL, CLOSE AND FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP = 115.23 (PSIA)

Total Volume: 3 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 240 Date: 5/12/98

Well Name: MW-4 Sampling Zone No.: 2 Starting Time: 0755 Finishing Time: 1000

Technicians T. BLANEY, J. Brenner

Water Level Inside MP Casing (Beginning of Session) 14.29 psia (End of Session) 14.32 psia

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	14.29	✓	0802	0804	✓	14.31	1	1ST Run; INITIAL Parameters NTU's = 1.77; Ready to Sample
2	✓	✓	✓	✓	✓	✓	14.27	✓	0820	0823	✓	14.26	1	Sample MW-982-008: VOAs, ½ 1,4 Dioxan Sample MW-982-009: VOAs; [redacted]
3	✓	✓	✓	✓	✓	✓	14.24	✓	0836	0839	✓	14.26	1	Sample MW-982-008; ½ 1,4 Dioxane (1), ½ 1,4 Dioxane (2)
4	✓	✓	✓	✓	✓	✓	14.26	✓	0853	0856	✓	14.29	1	Sample MW-982-008, ½ NDMA (1) ½ 1,4 Dioxane (2)
5	✓	✓	✓	✓	✓	✓	14.24	✓	0908	0912	✓	14.26	1	Sample MW-982-008; ½ NDMA (1) + ½ NDMA (2)
6	✓	✓	✓	✓	✓	✓	14.26	✓	0922	0925	✓	14.29	1	Sample MW-982-008; ½ NDMA (2) ½ metals Sample MW-982-009 ½ metals
7	✓	✓	✓	✓	✓	✓	14.29	✓	0938	0941	✓	14.31	1	Sample MW-982-008 ½ metals, Cr+6, ~~Stop~~ NITRATE Sample MW-982-009 ½ metals, Cr+6, ~~Stop~~
8	✓	✓	✓	✓	✓	✓	14.30	✓	0952	0954	✓	14.32	0.5 ~~0.75~~	FINAL Parameters -008 ClO_4 +-009 ClO_4
9														
10														
11														
12														

Comments:

Total Volume: 7.5 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-4 Depth: 150' Date: 5-4-98

Well Name: MW-4 Sampling Zone No.: SCREEN 1 Starting Time: 1510 Finishing Time: 1555

Technicians J. BRENNER & D. DIRKIN

Water Level Inside MP Casing (Beginning of Session) 14.24 (PSA) (End of Session) 14.23 (PSA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.24	✓	1515	1518	✓	14.22	1	1ST RUN, INITIAL PARAMETERS NTUS = 3.71
2	✓	✓	✓	✓	✓	✓	14.20	✓	1535	1539	✓	14.21	1	COLLECT SAMPLE. MW-982-007, 2 VOA, METALS, ANIONS, Y_2Cr^{+6} - (2nd RUN)
3	✓	✓	✓	✓	✓	✓	14.22	✓	1549	1551	✓	14.23	1	3rd RUN, FINAL PARAMETERS NTUS = 3.07
4														
5														
6														
7														
8														
9														
10														
11														
12														

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Comments: W/L OUTSIDE MP = 52.65

Total Volume: 3L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 639 Date: 4/30/99

Well Name: MW-11 Sampling Zone No.: 5 Starting Time: 1025 Finishing Time: 1155

Technicians J. BRENNER, D. DIRIEN

Water Level Inside MP Casing (Beginning of Session) 159.79 (PSIA) (End of Session) 159.77 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	159.79	✓	1027	1030	✓	159.79	1.0	1ST RUN: INITIAL PARAMETERS, NTUS = 1.63
2	✓	✓	✓	✓	✓	✓	159.80	✓	1113	1115	✓	159.82	1.0	2ND RUN, COLLECT MW-982-024 2 VOAS METALS, ANIONS, HEX. CR.
3	✓	✓	✓	✓	✓	✓	159.76	✓	1141	1143	✓	159.77	1.0	3RD RUN; PERCHLORATE FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP CASING = 199.36 (PSIA)

Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 524 Date: 4/30/99

Well Name: MW-11 Sampling Zone No.: 4 Starting Time: 0915 Finishing Time: 1020

Technicians J. BRENNAN, D. DIRKIN

Water Level Inside MP Casing (Beginning of Session) 110.48 (PSIA) (End of Session) 109.39 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	110.48	✓	0924	0929	✓	110.47	1.0	1ST RUN, INITIAL PARAMETERS NTU'S = 4.15
2	✓	✓	✓	✓	✓	✓	110.46	✓	0948	0950	✓	110.49	1.0	2ND RUN; COLLECT MW-982-023; 2 VOAS METALS, ANIONS, HEX CR
3	✓	✓	✓	✓	✓	✓	109.40	✓	1010	1012	✓	109.39	0.5	3RD; PERCHLORATE; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP CASING = 173.73 (PSIA)

Total Volume: 2.5 L

F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 429 Date: 4/30/98

Well Name: MW-11 Sampling Zone No.: 3 Starting Time: 1200 Finishing Time: 1300

Technicians J. BRENNER, D. DIRKIN

Water Level Inside MP Casing (Beginning of Session) 69.38 (PSIA) (End of Session) 69.37 (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	✓	✓	✓	✓	✓	✓	69.38	✓	1219	1223	✓	69.37	1.0	1ST RUN; INITIAL PARAMETERS NTUS = 2.06
2	✓	✓	✓	✓	✓	✓	69.39	✓	1229	1231	✓	69.41	1.0	2ND RUN; COLLECT MW-982-022 2 VOAS, METALS, ANIONS, HEX. Cr
3	✓	✓	✓	✓	✓	✓	69.37	✓	1249	1251	✓	69.37	1.0	3RD RUN; PERCHLORATE; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP CASING = 136.59 (PSIA)

Total Volume: 3.0 L

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 259 Date: 4/30/98

Well Name: MW-11 Sampling Zone No.: 2 Starting Time: 1305 Finishing Time: 1350

Technicians: J. BRENNER, D. DIRKIN

Water Level Inside MP Casing (Beginning of Session) 14.27 (PS,A) (End of Session) 14.27 (PS,A)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.27	✓	1311	1314	~~14.28~~ ✓	14.23	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 1.44
2	✓	✓	✓	✓	✓	✓	14.28	✓	1329	1333	✓	14.29	1.0	2ND RUN; COLLECT MW-98Z-021 2 VOAS, METALS, ANIONS, HEX. Cr
3	✓	✓	✓	✓	✓	✓	14.29	✓	1347	1349	✓	14.27	0.5	3RD RUN; PERCHLORATE; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE M/P CASING = 70.25 (PS,A)

Total Volume: 2.5 L

F2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-11 Depth: 149 Date: 4/30/98

Well Name: MW-11 Sampling Zone No.: 1 Starting Time: 1355 Finishing Time: 1440

Technicians J. BRENNER, D. DIRICK

Water Level Inside MP Casing (Beginning of Session) 14.34 (PS.A) (End of Session) 14.30 (PS.A)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.34	✓	1402	1407	✓	14.31	1.0	1ST RUN; INITIAL PARAMETERS, NTU'S = 1.06
2	✓	✓	✓	✓	✓	✓	14.31	✓	1418	1423	✓	14.29	1.0	2ND RUN; COLLECT MW-98Z-020; 2VOAS, METALS, ANIONS, HEX. C
3	✓	✓	✓	✓	✓	✓	14.29	✓	1433	1435	✓	14.30	0.5	3RD; PERCHLORATE; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP CASING = 33.29 (PS.A)

Total Volume: 2.5L [F2]

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 548' Date: 5-1-98

Well Name: MW-12 Sampling Zone No.: SCREEN 5 Starting Time: 0915 Finishing Time: 1040

Technicians D. DIRKIN & J. BAENNER

Water Level Inside MP Casing (Beginning of Session) 110.85 PSIA (End of Session) 110.79 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	110.85	✓	0935	0937	✓	110.84	1	1ST RUN, INITIAL PARAMETERS, NTU'S = 5.48
2	✓	✓	✓	✓	✓	✓	110.80	✓	1000	1003	✓	110.80	1	2nd run, COLLECT MW-982-030; MS/MSD VOAS + METALS 3 VOAS, METALS/ANION, ~~Hex Chrome~~ (SD)
3	✓	✓	✓	✓	✓	✓	110.80	✓	1031	1034	✓	110.79	1	3rd run, ½ Anions, COD, CLAY, final parameters NTU's = 2.08
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: W/L OUTSIDE MP CASING = 174.50 (PSIA)

Total Volume: 3 l

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 436' Date: 5-1-98

Well Name: MW-12 Sampling Zone No.: SCREEN 4 Starting Time: 1051 Finishing Time: 1206

Technicians D. DIRKIN & J. BRENNER

Water Level Inside MP Casing (Beginning of Session) 62.10 (PSIA) (End of Session) 62.07 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	62.10	✓	1058	1100	✓	62.14	1	1ST RUN, INITIAL PARAMETERS, NTU's = 1.66
2	✓	✓	✓	✓	✓	✓	62.10	✓	1123	1126	✓	62.14	1	2nd RUN, COLLECT MW-98Z-029; VOAS, METALS, ANIONS, CrIII
3	✓	✓	✓	✓	✓	✓	62.07	✓	1147	1149	✓	62.07	1	3rd RUN, etc.; FINAL PARAMETERS NTUs = 2.23
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: W/L outside MP CASING = 150.85 (PSIA)

Total Volume: 3 l

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 323 Date: 5-1-98

Well Name: MW-12 Sampling Zone No.: SCREEN 3 Starting Time: 1205 Finishing Time: 1300

Technicians D. DIRKIN & T. BRENNER

Water Level Inside MP Casing (Beginning of Session) 14.42 (PS.A) (End of Session) 14.40 (PS.A)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.42	✓	1215	1217	✓	14.39	1	1ST RUN; INITIAL PARAMETERS, NTU= 4.45
2	✓	✓	✓	✓	✓	✓	14.38	✓	1233	1236	✓	14.35	1	~~2ND~~ 2nd RUN, COLLECT MW-9802-028 2 VOAS, METALS, ANIONS, CrVI
3	✓	✓	✓	✓	✓	✓	14.42	✓	1252	1255	✓	14.40	1	3rd RUN, FINAL PARAMETERS; ClO_4 NTU'S=2.65
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: W/L OUTSIDE MP CASING: 108.55 (PS.A) Total Volume: 3 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 243' Date: 5-1-98

Well Name: MW-12 Sampling Zone No.: 2 Starting Time: 1305 Finishing Time: 1400

Technicians D. Dickin & S. Brenner

Water Level Inside MP Casing (Beginning of Session) 14.39 (FS.A) (End of Session) 14.32 (FS.A)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.39	✓	1312	1315	✓	14.35	1	1st run, initial parameters; NTUs 1.64
2	✓	✓	✓	✓	✓	✓	14.37	✓	1329	1332	✓	14.34	1	2nd run, collect MW-982-0226 & 6(VOAs) 2 metals/2 anions MW-982-0227 Duplicate
3	✓	✓	✓	✓	✓	✓	14.37	✓	1348	1351	✓	14.32	1	3rd run, 1/2 anions, 2 COD & 2 cloud, final parameters NTU
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments: W/L outside mp = 76.14 (FS.D)

Total Volume: 3 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 140' Date: 5-1-97

Well Name: MW-12 Sampling Zone No.: SCREEN 1 Starting Time: 1405 Finishing Time: 1445

Technicians D. DERKIN & J. BRENNER

Water Level Inside MP Casing (Beginning of Session) 14.29 (PSIA) (End of Session) 14.19 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.20	✓	1410	1414	✓	14.18	1	1ST RUN, INITIAL PARAMETERS, NTU'S = 71.8
2	✓	✓	✓	✓	✓	✓	14.29	✓	1425	1430	✓	14.19	1	2nd RUN, INTEGRITY TO REDUCE TURBIDITY NTUS = 57.6
3														* WILL RETURN TO MW-12-1 ON 5/4/98
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: w/l outside MP = 41.08

Total Volume: 2.0L

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-12 Depth: 140' Date: 5-4-98

Well Name: MW-12 Sampling Zone No.: SCREEN 1 Starting Time: 0830 Finishing Time: 1120

Technicians D. DIRKIN, J. BRENNER & T. BLANEY

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

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	✓	0839	0843	✓	14.17	1	1ST RUN, INITIAL PARAMETERS, NTUs = 35.3
2	✓	✓	✓	✓	✓	✓	14.19	✓	0856	0900	✓	14.24	1	2nd RUN, ATTEMPTING TO REDUCE TURBIDITY NTUs: 33.2
3	✓	✓	✓	✓	✓	✓	14.20	✓	0911	1011	✓	14.20	N/A	3rd RUN, ATTEMPTING TO REDUCE TURBIDITY (PURGING) NO: SAMPLE BOTTLES
4	✓	✓	✓	✓	✓	✓	14.20	✓	1030	1034	✓	14.24	1	4TH RUN ATTEMPTING TO REDUCE TURBIDITY NTUs = 4.78
5	✓	✓	✓	✓	✓	✓	14.20	✓	1054	1058	✓	14.22	1	5TH RUN. COLLECT MW-082-025; 2 VOAs, METALS, ANIONS, ~~ETC~~
6	✓	✓	✓	✓	✓	✓	14.22	✓	1110	1115	✓	14.20	1	6TH RUN, COLLECT CN & CHOL; FINAL PARAMETERS NTUs: 4.75
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE OF MP = 41.10 (PS1D1)

Total Volume: 5l

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179.55

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 540 Date: 4-28-98

Well Name: MW-14 Sampling Zone No.: 5 Starting Time: 0835 Finishing Time: 0955

Technicians L. Dakka, M. Cosi

Water Level Inside MP Casing (Beginning of Session) 144.61 (End of Session) 144.53

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate Shoe	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate Shoe	Valve Open Time	Valve Closed Time	Deactivate Shoe	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	144.61	✓	0848	0850	✓	144.59	1	Initial Run to Screen #5 - collect Parameters ✓037;
2	✓	✓	✓	✓	✓	✓	144.58	✓	0919	0922	✓	144.61	1	Collect MW-98Z - VOAs, metals 4"ø 6.m, 1/2 Hex cv.
3	✓	✓	✓	✓	✓	✓	144.53	✓	0945	0947	✓	144.53	1	Collect Remaining MW-98Z-037 sample 4"ø, Hex cv, Clay, final Parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

F-2

143.43

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 456 Date: 4.28.98

Well Name: MW-14 Sampling Zone No.: 4 Starting Time: 1004 Finishing Time: 1113

Technicians L. Dacre, M Losi

Water Level Inside MP Casing (Beginning of Session) 107.97 (BMP) (End of Session) 107.90 (BMP)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate Shoe	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate Shoe	Valve Open Time	Valve Closed Time	Deactivate Shoe	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	107.97	✓	1011	1013	✓	107.95	1	~~1st Run to screen #4 -~~ Initial Parameters NTU's 1.30
2	✓	✓	✓	✓	✓	✓	107.92	✓	1032	1034	✓	107.97	1	Collect MW-98e-036, collect VOCs, metals, C.M. 1/6 Hexcr.
3	✓	✓	✓	✓	✓	✓	107.95	✓	1059	1101	✓	107.90	1	3rd Run to screen #4 - collect Hexcr + Cl04, ~~final~~ Parameters
4	~~✓~~	~~✓~~	~~✓~~	ed 4/28/98										
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

111.37

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 382 Date: 4.28.98

Well Name: MW-14 Sampling Zone No.: 3 Starting Time: 1115 Finishing Time: 1215

Technicians L. Dakka, M Cosi

Water Level Inside MP Casing (Beginning of Session) 75.69 (PSIA) (End of Session) 75.68 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate Shoe	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate Shoe	Valve Open Time	Valve Closed Time	Deactivate Shoe	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	75.69	✓	1122	1125	✓	75.68	1	1st RUN to SCREEN #3, collect Parameters, NTUs =
2	✓	✓	✓	✓	✓	✓	75.71	✓	1142	1144	✓	75.68	1	2nd RUN, collect MW-98C-035 VOAs MS/MSD, Metals, MS/MSD
3	✓	✓	✓	✓	✓	✓	75.64	✓	1204	1207	✓	75.68	1	3rd RUN to SCREEN #3, collect B. Minerals, Iodide, Cl, Parameters.
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: _____ Total Volume: 3 L

65.81

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-14 Depth: 277 Date: 4.28.98

Well Name: MW-14 Sampling Zone No.: 2 Starting Time: 1223 Finishing Time: 1315

Technicians L.Dorrough, M Cosi

Water Level Inside MP Casing (Beginning of Session) 30.06 (PS.A) (End of Session) 30.02 (PS.A)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate Shoe	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate Shoe	Valve Open Time	Valve Closed Time	Deactivate Shoe	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	30.06	✓	1226	1230	✓	30.12	1	1st Run to screen #2 - Initial Parameters NTU = 4.58
2	✓	✓	✓	✓	✓	✓	30.08	✓	1244	1248	✓	30.07	1	Collect MW-98-034, VOC's, Metals, G. Minerals
3	✓	✓	✓	✓	✓	✓	30.01	✓	1304	1308	✓	30.02		3rd Run to screen #2 - Turbidity, final parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

35.25

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling

Field Data Sheet for Multi-Port Well

Project: JPL Location: mw-14 Depth: 207 Date: 4/28/98

Well Name: mw-14 Sampling Zone No.: 1 Starting Time: ~~14~~ 1320 Finishing Time: 1415

Technicians C. Dorsey, M Cosi

Water Level Inside MP Casing (Beginning of Session) 14.22 (PSIA) (End of Session) 14.11 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate Shoe	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate Shoe	Valve Open Time	Valve Closed Time	Deactivate Shoe	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.22	✓	1323	1328	✓	14.25	1	~~START~~ RUN to screen #1 Initial Parameters, NTU = 3.08
2	✓	✓	✓	✓	✓	✓	14.33	✓	1341	1346	✓	14.21	1	Collect sample in mw-982-033 VOCs, metals, anions
3	✓	✓	✓	✓	✓	✓	14.39	✓	1402	1406	✓	14.11	1	3rd RUN to screen #1, flex cr + Clay, final parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 30L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 726 Date: 4/22/98

Well Name: MW-18 Sampling Zone No.: 5 Starting Time: 0825 Finishing Time: 1005

Technicians J. BRENNER, D. DIRKIN

Water Level Inside MP Casing (Beginning of Session) 174.59 (PSIA) (End of Session) 173.47 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	174.59	✓	0836	0839	✓	174.57	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 3.71
2	✓	✓	✓	✓	✓	✓	174.51	✓	0920	0923	✓	174.52	1.0	2ND RUN; COLLECT MW-582-0424; 2 VOAS, METALS, ANIONS, C-04
3	✓	✓	✓	✓	✓	✓	173.45	✓	0956	0959	✓	173.47	0.5	3RD RUN; TURBIDITY, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP = 208.70 PSIA @ SCREEN #5

Total Volume: 2.5

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 582 Date: 4/22/98

Well Name: MW-17 Sampling Zone No.: 4 Starting Time: 1015 Finishing Time: 1045

Technicians J. BRENNER, D. DIRKIN

Water Level Inside MP Casing (Beginning of Session) 111.83 (PSIA) (End of Session) 111.78 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	111.83	✓	1030	1034	✓	111.85	1.0	1ST RUN; INITIAL PARAMETERS, NTU'S = 3.73
2	✓	✓	✓	✓	✓	✓	111.85	✓	1058	1102	✓	111.87	1.0	2ND RUN; COLLECT MW-982-0013, 6 VOAS, METALS (MS/MSD) 1/2 ANIONS
3	✓	✓	✓	✓	✓	✓	111.79	✓	1133	1138	✓	111.78	1.0	3RD RUN; 1/2 ANIONS, HEX CR, PERCHLORATE, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

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Comments: W/L OUTSIDE MP CASING = 151.75 PSIA

Total Volume: 3.0

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 468 Date: 5/11/95

Well Name: MW-17 Sampling Zone No.: 3 Starting Time: 0832 Finishing Time: 1115

Technicians J. BRENNER, M. LOSI

Water Level Inside MP Casing (Beginning of Session) 62.45 (PSIA) (End of Session) 62.21 (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	✓	✓	✓	✓	✓	✓	62.45	✓	0844	0847	✓	62.43	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 3.61
2	✓	✓	✓	✓	✓	✓	62.43	✓	0907	0910	✓	62.41	1.0	2ND RUN; COLLECT MW-982-042 2 VOA'S, 1/2 DIOXANE
3	✓	✓	✓	✓	✓	✓	62.43	✓	0929	0933	✓	62.42	1.0	3RD RUN; 1/2 DIOXANE
4	✓	✓	✓	✓	✓	✓	62.39	✓	0951	0955	✓	62.40	1.0	4TH RUN; 1/2 NDMA
5	✓	✓	✓	✓	✓	✓	62.35	✓	1018	1021	✓	62.33	1.0	5TH RUN; 1/2 NDMA
6	✓	✓	✓	✓	✓	✓	62.28	✓	1040	1044	✓	62.26	1.0	6TH RUN; METALS, 1/2 ANIONS
7	✓	✓	✓	✓	✓	✓	62.24	✓	1104	1107	✓	62.21	1.0	7TH RUN; 1/2 ANIONS; HEX. Cr, ClO_4; FINAL PARAMETERS
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP CASING = 119.45 (PSIA)

Total Volume: 7.0 L

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 370 Date: 4/22/98

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

Technicians: J. BRENNER, D. DIRKIN

Water Level Inside MP Casing (Beginning of Session) 19.68 (PSIA) (End of Session) 18.63 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	19.68	✓	1202	1205	✓	19.70	1.0	1ST RUN) INITIAL PARAMETERS, NTU's = 2.15
2	✓	✓	✓	✓	✓	✓	19.71	✓	1226	1230	✓	19.70	1.0	2ND RUN; COLLECT MW-182-041 2 VOA's, METALS, ANION'S, WET. CH.
3	✓	✓	✓	✓	✓	✓	18.60	✓	1248	1251	✓	18.63	0.5	3RD RUN; TURBIDITY, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP. CASING = 84.90

Total Volume: 2.5

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 250 Date: 4/22/98

Well Name: MW-17 Sampling Zone No.: 1 Starting Time: 1315 Finishing Time: 1430

Technicians J. BIRENNER, D. DIRKIN

Water Level Inside MP Casing (Beginning of Session) 14.39 (PSIA) (End of Session) 14.25 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.39	✓	1317	1323	✓	14.34	1.0	1ST PURGE; INITIAL PARAMETERS NTO'S
2	✓	✓	✓	✓	✓	✓	14.30	✓	1341	1346	✓	14.31	1.0	2ND PURGE; COLLECT MW-98Z-040; 2 VOAS, METALS, ANIONS, [illegible]
3	✓	✓	✓	✓	✓	✓	14.32	✓	1402	1407	✓	14.25	1.0	3RD PURGE; HEX. CR., PERCHLORATE FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP CASING = 43.82 (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: 684 Date: 4/20/98

Well Name: MW-18 Sampling Zone No.: SCREEN 5 Starting Time: 1000 Finishing Time: 1505

Technicians MOSI LOAHEIGH

Water Level Inside MP Casing (Beginning of Session) 150.50 (End of Session) 150.53

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	✓	✓	✓	✓	✓	✓	150.50	✓	1343	1346	✓	150.52	1.0	FIRST RUN; INITIAL PARAMETERS; RINSE BOTTLES W/FORMATION WATER
2	✓	✓	✓	✓	✓	✓	150.60	✓	1412	1415	✓	150.61	1.0	2ND RUN SAMPLE MW-982-049, VOCs, VOCSMS, VOCSMSD, METALS
3	✓	✓	✓	✓	✓	✓	150.46	✓	1444	1447	✓	150.53	1.0	3RD RUN SAMPLE MW-982-049 ANIONS, Cr^{6+}, ClO_4^-, FINAL PARAMS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

F-2

140.85

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPG Location: MW-18 Depth: 564 Date: 4/21/98

Well Name: MW-18 Sampling Zone No.: 4 Starting Time: 0830 Finishing Time: 0935

Technicians J. BRENNER, D. DIRKIN, M. LOSI, B. DARRAGH

Water Level Inside MP Casing (Beginning of Session) 98.93 (End of Session) 98.86

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	✓	✓	✓	✓	✓	✓	98.93	✓	0843	0845	✓	98.93	1 Liter	1st Run to screen #4, Initial Parameters NTU = 0.04
2	✓	✓	✓	✓	✓	✓	98.88	✓	0910	0913	✓	98.91	1 Liter	2nd Run to screen #4, Collect 4 Aliquots Sample #982-048, VOC's, Metals
3	✓	✓	✓	✓	✓	✓	98.86	✓	0939	0941	✓	98.86	500mL	3rd Run to screen #4, Top off 1 Bex Chrom, Perchlorate, 1 final parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 2.5L F2

92.40

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-18 Depth: 424 Date: 4/21/98

Well Name: MW-18 Sampling Zone No.: 3 Starting Time: 1000 Finishing Time: 1110

Technicians: J Brenny, D Dirden, M Cosi L. Dalke

Water Level Inside MP Casing (Beginning of Session) 38.05 (End of Session) 38.09

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	✓	✓	✓	✓	✓	✓	38.05	✓	1010	1013	✓	38.05	1	1st Run to screen #3, Initial Parameters NTU's = 0.04
2	✓	✓	✓	✓	✓	✓	38.07	✓	1034	1037	✓	38.08	1	2nd Run to screen #3, collect MW-982-047 VOCs, metals, Anions
3	✓	✓	✓	✓	✓	✓	38.05	✓	1058	1101	✓	38.09	1	3rd Run to Screen #3, collect Haxor, CLay, final Parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

52.16

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-18 Depth: 330 Date: 4.21.98

Well Name: MW-18 Sampling Zone No.: 2 Starting Time: 1120 Finishing Time: 1230

Technicians C. Durrell, D Divkii, M. Losi

Water Level Inside MP Casing (Beginning of Session) 14.14 (End of Session) 14.09

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	14.14	✓	1129	1133	✓	14.12	1	1st Run to screen #2 - Initial Parameters NTU's = 0.05
2	✓	✓	✓	✓	✓	✓	14.11	✓	1151	1155	✓	14.13	1	2nd Run collect MW-98Z-046 VOCs, metals, Anions
3	✓	✓	✓	✓	✓	✓	14.20	✓	1214	1218	✓	14.19	1	3rd Run to screen #2 - Collect Hex chrom / CLW4, Parameters FINAL
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

F-2

26.41

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPC Location: MW-18 Depth: 270 Date: 4.21.98

Well Name: MW-18 Sampling Zone No.: 1 Starting Time: 1345 Finishing Time: 1350

Technicians: L. Dazzo, D Divkin, M. Losi

Water Level Inside MP Casing (Beginning of Session) 14.35 (End of Session) 14.15

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	✓	✓	✓	✓	✓	✓	14.35	✓	1246	1246	✓	14.17	1	1st Run - Screen #2, Collect Parameters, NTUs = 0.08
2	✓	✓	✓	✓	✓	✓	14.39	✓	1306	1312	✓	14.17	1	2nd Run - collect mw 782-045 VOC, metals, Anions
3	✓	✓	✓	✓	✓	✓	14.40	✓	1337	1343	✓	14.15	1	3rd Run - Collect, Hexchrom, Clay Final Parameters.
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-19 Depth: 499 Date: 4/24/98

Well Name: MW-19 Sampling Zone No.: 5 Starting Time: 0820 Finishing Time: 0935

Technicians: J. BRENNER, M. COSI

Water Level Inside MP Casing (Beginning of Session) 80.06 (PSIA) (End of Session) 79.95 (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	✓	✓	✓	✓	✓	✓	80.06	✓	0815	0820	~~80.04~~ ✓	80.04	1.0	1ST RUN; INITIAL PARAMETERS, NTU'S = 3.96
2	✓	✓	✓	✓	✓	✓	79.96	✓	0850	0853	✓	79.95	1.0	2ND RUN; COLLECT MW-6182-0541; 2 VOAS, METALS, ANIONS, HEX.C.
3	✓	✓	✓	✓	✓	✓	79.96	✓	0917	0920	✓	79.95	1.0	3RD RUN; PERCHLORATE, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP CASING = 135.90 (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-19 Depth: 444 Date: 4/24/98

Well Name: MW-19 Sampling Zone No.: 4 Starting Time: 0940 Finishing Time: 1040

Technicians J. BRENNER, M. LOSI

Water Level Inside MP Casing (Beginning of Session) 56.46 (PSIA) (End of Session) 56.46 (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	✓	✓	✓	✓	✓	✓	56.46	✓	0943	0946	✓	56.48	1.0	1ST RUN; INITIAL PARAMETERS, NTU'S = 11.9
2	✓	✓	✓	✓	✓	✓	56.44	✓	1004	1007	✓	56.44	1.0	2ND RUN; NTU'S = 4.75; COLLECT MW-982-055; 2 VOAS, METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	56.44	✓	1029	1033	✓	56.46	1.0	3RD RUN; HEX. CR, PERCHLORATE FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP CASING = 112.58 (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-19 Depth: 392 Date: 4/24/98

Well Name: MW-19 Sampling Zone No.: 3 Starting Time: 1045 Finishing Time: 1150

Technicians J. BRENNER, M. LOSI

Water Level Inside MP Casing (Beginning of Session) 33.83 (FS,A) (End of Session) 33.82 (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	✓	✓	✓	✓	✓	✓	33.83	✓	1056	1059	✓	33.85	1.0	1ST RUN; INITIAL PARAMETERS, NTU'S = 2.35
2	✓	✓	✓	✓	✓	✓	33.82	✓	1118	1122	✓	33.85	1.0	2ND RUN; COLLECT MW-82-052 2 VOAS, METALS, ANIONS, HEX. C.
3	✓	✓	✓	✓	✓	✓	33.82	✓	1140	1144	✓	33.82	1.0	3RD RUN; PERCHLORATE, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP CASING = 113.57 (PSIA)

Total Volume: 3.0 L

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPC Location: MW-19 Depth: 314 Date: 4/24/98

Well Name: MW-19 Sampling Zone No.: 2 Starting Time: 1200 Finishing Time: 1300

Technicians J. BRENNER, M. LOSI

Water Level Inside MP Casing (Beginning of Session) 14.26 (PSIA) (End of Session) 14.26 (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	✓	✓	✓	✓	✓	✓	14.26	✓	1202	1206	✓	14.27	1.0	1ST RUN; INITIAL PARAMETERS, NTU'S = 2.29
2	✓	✓	✓	✓	✓	✓	14.26	✓	1223	1228	✓	14.26	1.0	2ND RUN; COLLECT MW-182-051 2 VOAS, METALS, ANIONS, HEX. CR.
3	✓	✓	✓	✓	✓	✓	14.25	✓	1247	1252	✓	14.26	1.0	3RD RUN; PERCHLORATE; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														

s: W/L OUTSIDE MP CASING = 81.38 (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-19 Depth: 242 Date: 4/24/98

Well Name: MW-19 Sampling Zone No.: 1 Starting Time: 1305 Finishing Time: 1405

Technicians J. BIENNEK, M. LOSI

Water Level Inside MP Casing (Beginning of Session) 14.26 (PSIA) (End of Session) 14.26 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.28	✓	1307	1312	✓	14.24	1.0	1ST RUN; INITIAL PARAMETERS; NTU'S = 2.15
2	✓	✓	✓	✓	✓	✓	14.26	✓	1325	1330	✓	14.27	1.0	2ND RUN; COLLECT MW-982-0560 2 VOAS, METALS, ANIONS, HEXCR
3	✓	✓	✓	✓	✓	✓	14.27	✓	1344	1349	✓	14.26	1.0	3RD RUN; PERCHLORATE, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														

W/L OUTSIDE MP CASING = 58.78 (PSIA)

Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-20 Depth: 900 Date: 4/23/98

Well Name: MW-20 Sampling Zone No.: 5 Starting Time: 0805 Finishing Time: 0935

Technicians: J. BRENNER, M. LOSI

Water Level Inside MP Casing (Beginning of Session) 268.38 (PSIA) (End of Session) 268.33 (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	✓	✓	✓	✓	✓	✓	268.38	✓	0817	0819	✓	268.37	1.0	1ST RUN; INITIAL PARAMETERS, NTUs = 1.10
2	✓	✓	✓	✓	✓	✓	268.38	✓	0851	0853	✓	268.36	1.0	2ND RUN; COLLECT MW-982-059; 2 VOAs, METALS, ANIONS, HEXCR
3	✓	✓	✓	✓	✓	✓	267.35	✓	0923	0924	✓	267.33	0.5	3RD RUN; TURBIDITY; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP CASING = 320.20 (PSIA)

Total Volume: 2.5 L[F2]

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-20 Depth: 700 Date: 4/23/98

Well Name: MW-20 Sampling Zone No.: [redacted] 4 Starting Time: 0940 Finishing Time: 1110

Technicians J. BRENNER, M. LOSI

Water Level Inside MP Casing (Beginning of Session) 181.46 (PSIA) (End of Session) 181.32 (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	✓	✓	✓	✓	✓	✓	181.46	✓	0955	0957	✓	181.47	1.0	1ST RUN; INITIAL PARAMETERS, NN'S = 1.71
2	✓	✓	✓	✓	✓	✓	181.39	✓	1023	1025	✓	181.40	1.0	2ND RUN; COLLECT MW-982-0528 2 VOAS, METALS, ANIONS, HEX. Cr.
3	✓	✓	✓	✓	✓	✓	181.31	✓	1051	1054	✓	181.32	1.0	3RD RUN; PERCHLORATE, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP CASING = 223.51 (PSIA)

Total Volume: 30 L [2]

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-20 Depth: 562 Date: 4/23/98

Well Name: MW-20 Sampling Zone No.: 3 Starting Time: 1115 Finishing Time: 1245

Technicians J. BRENNER, M. LOSI

Water Level Inside MP Casing (Beginning of Session) 121.31 (PSIA) (End of Session) 120.27 (PSIA)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	121.31	✓	1150	1152	✓	121.30	1.0	1ST RUN; INITIAL PARAMETERS, NTU'S = 1.29
2	✓	✓	✓	✓	✓	✓	121.29	✓	1212	1214	✓	121.31	1.0	2ND RUN; COLLECT MW-98[illegible]-057 ZVOAS, METALS, ANIONS, HEX. Cr
3	✓	✓	✓	✓	✓	✓	120.26	✓	1235	1237	✓	120.27	0.5	3RD RUN; PERCHLORATE, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP CASING = 169.40 (PSIA)

Total Volume: 2.5 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-20 Depth: 392 Date: 4/23/98

Well Name: MW 20 Sampling Zone No.: 2 Starting Time: 1250 Finishing Time: 1350

Technicians J. BENNER, M. LOSI

Water Level Inside MP Casing (Beginning of Session) 47.51 (PSIA) (End of Session) 47.49 (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	✓	✓	✓	✓	✓	✓	47.51	✓	1256	1258	✓	47.50	1.0	1ST RUN; INITIAL PARAMETERS, NTU'S = 1.35
2	✓	✓	✓	✓	✓	✓	47.53	✓	1314	1317	✓	47.51	1.0	2ND RUN; COLLECT MW #82-056 6 VOAS, METALS, 1/2 ANIONS
3	✓	✓	✓	✓	✓	✓	47.50	✓	1336	1339	✓	47.49	1.0	3/2P RUN; 1/2 ANIONS, HEX. CR., PERCHLORATE, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP CASING = 97.51 (PSIA)

Total Volume: 3.0

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-20 Depth: 230 Date: 4/23/98

Well Name: MW-20 Sampling Zone No.: 1 Starting Time: 1355 Finishing Time: 1450

Technicians J. BRENNER, M. LOSI

Water Level Inside MP Casing (Beginning of Session) 14.26 (PSIA) (End of Session) 14.31 (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	✓	✓	✓	✓	✓	✓	14.26	✓	1357	1402	✓	14.29	1.0	1ST RUN; INITIAL PARAMETERS, NTUS = 2.97
2	✓	✓	✓	✓	✓	✓	14.26	✓	1416	1422	✓	14.31	1.0	2ND RUN; COLLECT MW-982-055; 2 VOAS, METALS ANIONS, ~~HEX. CR~~
3	✓	✓	✓	✓	✓	✓	14.31	✓	1435	1442	✓	14.31	1.0	3RD RUN; HEX. CR / PERCHLORATE; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP CASING = 25.77 (PSIA)

Total Volume: 3.0

F-2

Continue

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-21 Depth: 372 Date: 4/27/98

Well Name: MW-21 Sampling Zone No.: 5 Starting Time: 0845 (1431) Finishing Time: 0950 (1530)

Technicians: J. BRENNER, D. DIRKIN

Water Level Inside MP Casing (Beginning of Session) 123.97 (PSIA) (End of Session) 133.07 (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	✓	✓	✓	✓	✓	✓	123.97	✓	0850	0853	✓	123.96	1.0	1ST RUN, INITIAL PARAMETERS, NTU'S = 11.5
2	✓	✓	✓	✓	✓	✓	123.87	✓	0913	0915	✓	123.87	1.0	2ND RUN, ATTEMPTING TO REDUCE TURBIDITY, NTU'S = 26.4
3	✓	✓	✓	✓	✓	✓	123.82	✓	0932	0945	✓	123.83	1.0	3RD RUN, ATTEMPTING TO REDUCE TURBIDITY, NTU'S = 27.5
4														* WILL RETURN LATER
5	✓	✓	✓	✓	✓	✓	134.21	✓	1435	1439	✓	134.24	1.0	4TH RUN (RETURN TO SCREEN #5 AFTER PURGING 2.5 GALS.) NTU'S = 4.63
6	✓	✓	✓	✓	✓	✓	134.20	✓	1455	1459	✓	134.18	1.0	5TH RUN, COLLECT MW-182-064 EVOCS, METALS, ANIONS, HEX. CR.
7	✓	✓	✓	✓	✓	✓	133.09	✓	1514	1516	✓	133.67	0.5	6TH RUN, PERCHLORATE FINAL PARAMETERS
8														
9														
10														
11														
12														

Comments: W/L OUTSIDE MP CASING = 155.84 (PSIA)

* 2.5 GALS PURGED FROM SCREEN #5 IN ATTEMPT TO REDUCE TURBIDITY — THIS VOLUME NOT INCLUDED IN TOTAL REPORTED IN BOTTOM RIGHT HAND COLUMN.

Total Volume: * 6.5L